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Introduction

Why breed crickets?

Crickets are a staple feeder insect for most amphibians and reptiles, but they can also be fed to some species of fish and birds. Crickets naturally contain necessary carbohydrates, vitamins, minerals, and protein that these animals need to survive.

If you’ve ever owned a bearded dragon or leopard gecko, you’ve most likely had to purchase crickets on regular basis in order to feed your pet. You’ve also undoubtedly witnessed just how fast a growing young lizard can consume those crickets. It doesn’t take long for the money to add up. When you own a pet that requires live food, you come to realize that one of the largest chunks of your pet budget goes toward purchasing that live food. One of the great things about crickets is that they are fairly easy to care for and to breed, once you know the right way to do it. In the long run, you can save tons of money by breeding your own feeder crickets.

Aside from saving lots of money, another benefit of raising your own crickets is that it puts you in control of your pet’s health. You see, commercially bred crickets are not created equal. As humans, we’ve learned the effects of factory farming on the food that we eat and purchase from the grocery store. We know that the factory-farmed animals are not necessarily fed the healthiest diets or cared for in the best manner. We’ve learned the health benefits of buying locally raised food. The same concepts apply when it comes to the food you will ultimately serve your pet. When you breed and raise your own crickets, you get to decide how you are going to feed and care for them. In the end, you can feed them to your pets with complete confidence, knowing that they ate only the most nutritious food and lived in the cleanest environment.

This book is broken into two parts. Part one is the main section which teaches you how to start and maintain your cricket colony. You’ll discover what supplies you need and where to find them, how to set up the habitat, how to keep the right temperature, how to provide food and water, the best ways to clean the enclosures, how to prevent illnesses, and how to prepare the crickets before they are fed to another animal. Part two aims to inform you of some of the more fascinating facts about crickets. You’ll learn the science surrounding their famous chirp sounds, courtship, mating rituals, cricket chivalry, why it hurts to be a male cricket, and more. At the end of this book, I’ve offered a downloadable bonus as a special thanks, to you, my readers.

Without further ado, let’s get started!
Getting Started: What You Need

Preparing the cricket habitat

Before you can breed crickets successfully, you need a few basic items. Many of these items are common household supplies, while others are easily obtainable from local pet shops or department stores.

Tanks or Bins – You will need a minimum of two large (at least 10-gallon) tanks or plastic storage bins. The first tank will be used to house your adult breeder crickets, and the second one will be used to incubate the eggs and rear the young crickets.

Plastic Storage Bins or Aquarium Tanks?

There are advantages and disadvantages to both types of containers that you may choose to house your crickets in. I prefer and recommend an aquarium tank with a screen top for the following reasons:

*It is fairly easy to find screen top lids that fit your aquarium tank (since most tanks are a standard size). On the other hand, if you decide to use storage bins, you'll have to cut a large chunk of the top out for ventilation and then fasten some mesh wiring yourself. This is not a big deal, though you should be aware of the extra work involved.

*Most aquariums are designed to allow the simple attachment of a lighting / heating fixture.

*Aquariums are transparent. It's nice to be able to see what's going on in your cricket tank without having to open the top. Even if you use clear colored storage bins, the sides tend to be more cloudy than those of an aquarium.

There is, however, one significant advantage to using the plastic bins. Since the bins are light-weight, they are easier to move around and dump out for cleaning. These are all important points to consider before you decide which type of cricket housing container you will use.

Tip: Don't feel like you need to buy brand new tanks either. If you take the time to shop around, you can find great bargains at yard sales and even online. Crickets are not picky. As long as the tank is clean and secure, it will do just fine.

Another alternative would be to use typical, plastic critter cages. These cages
usually have plastic lids with lots of ventilation spaces. The ventilation spaces may be too large for housing the baby crickets, but can work well for the adult breeder crickets.

Overall, I still highly recommend housing your cricket colonies in aquariums with screen lids. Yet, if you are unable to get your hands on one of these, then you can certainly make do with plastic storage bins or critter cages.

Heat Lamps & Thermometers – Maintaining proper temperature is crucial for healthy cricket growth and breeding. Reptile heat lamps and clamp lamps (sold at places like Petco, PetSmart, and other pet stores) need to be attached to the top of both your tanks. It is a good idea to get small thermometers to place inside the tanks so that you can keep track of the temperature. We'll discuss more about temperature control in a later chapter.

Clear Packaging Tape – You may already have this lying around your house somewhere. If not, you can get it at almost any office supply store or post office. This is the glossy clear tape used to seal packages. You'll be placing a strip of it, horizontally, on each wall along the inner top part of the tank. This prevents crickets from climbing out. Believe it or not, crickets can even climb up smooth glass. This tape will prevent escapes.

Egg-Laying / Nesting Box – The female breeder crickets will need a special area of the tank where they can lay their eggs. The more horizontal space you provide, the more eggs they will lay. You can use a regular cardboard shoebox or a plastic shoebox for the egg-laying box. It shouldn't be more than a few inches deep. In fact, even a baking pan or plastic sandwich container can make a great nest box. This box will ultimately be placed inside a corner of the adult breeder tank. Later, I'll explain how to fill it with substrate and properly cover it before inserting it into the tank.

Wire Mosquito / Screen Mesh – Mesh will be used to cover the egg-laying box. It prevents the other adult crickets from eating the eggs while at the same time offers enough space for female crickets to slip their ovipositor tubes through. Wire mesh is recommended because crickets can often chew through a weaker material. If you happen to be using storage bins as your tanks, you'll also use this mesh to cover the large ventilation holes in the lids. The key is to choose mesh with the right spacing. It should be fine, but not so fine that the crickets cannot fit their ovipositors through the spaces.

Water Spray Bottle – You'll be using this to keep the egg substrate moist.

Vermiculite or Peat Moss – These are your ideal substrates. Vermiculite is a naturally occurring mineral that retains moisture quite well, which makes it an ideal nesting substrate. You can find medium to large-size bags of it at places like Home Depot, Lowes, and any gardening shop or greenhouse. In some
cities, you may have a more difficult time finding a large bag of vermiculite. If this is the case for you, then you can use peat moss for your substrate. Peat moss works just as well for nesting material and can be found for sale at almost any place that sells gardening supplies. Just make sure that it is asbestos-free. I do not recommend using regular potting soil in your cricket tanks because they often contain fertilizers and / or pesticides that can potentially harm the crickets and pass on to your pets. Potting soil can be used as long as it states “fertilizer-free” and “pesticide-free” on the bag. If it does not state this, you are better off not using it.

Cardboard Egg Cartons or Toilet Paper Rolls – Crickets love hiding and climbing in these. They'll chew the cardboard, which provides some fiber for their digestive systems. Don't use foam egg cartons because the material is not the best for crickets to consume. You can usually find some eggs that are selling in cardboard cartons at the grocery store. You can even go to some diners and grocery stores, and ask them if they have cardboard egg crates that they throw away. Usually, they do. Otherwise, you can simply use toilet paper rolls and paper towel rolls.

Water & Food Dishes – Anything that serves as a small, shallow bowl will suffice as a food / water dish. Empty, cleaned-out cream cheese containers work great for food, and jar lids are even better for water.

Cotton Batting or Sponge – Crickets can use fresh fruit as their water source, so you don't exactly need to offer them a bowl of H₂O. However, fresh fruit requires constant changing and removing (to avoid mold and bacteria). It can be easier to offer a water bowl with a sponge or cotton batting in it, which will prevent the crickets from drowning. You'll only fill it with a tiny bit of water, and the sponge or cotton will be soaked.

Cricket Food – For now, get at least one bag of at least one of these dry foods: commercial cricket chow, dog food, cat food, or chicken feed. There are much healthier items you can incorporate in the cricket feed, which we'll discuss in the next chapter. Think of these as an affordable base diet, or starting point for your crickets.

Once you have your tanks, heating lamps, packaging tape, nesting box, wire mesh, substrate, spray bottle, egg cartons / toilet paper rolls, food / water bowls, food, and cotton batting / sponge, you are ready to begin setting up the enclosures.

Instructions for setting up:

1.) Choose a location for your cricket farm. Ideally, the tanks should go somewhere indoors where you have control of the room temperature. You should place the cricket tanks on top of something so that they are elevated off
2.) Stick a strip of clear packaging tape, horizontally along each wall, inside the upper section of the tanks. This is an anti-escape tactic.

3.) Take the nesting box and fill it up to the brim with your substrate (vermiculite or peat moss). The substrate should be just 2% short of the top of the box. You want it to be completely full, but not overstuffed.

4.) Place the metal wire mesh over the top of the nesting box substrate. Don’t skip this step. It’s necessary to protect the eggs from being eaten or burrowed into.

5.) Now you can place the nest box into one of your tanks. This tank will be your adult breeder tank.

6.) Put the egg cartons and / or toilet paper rolls inside both tanks. They should be piled up on top of one another to allow for climbing. Crisscross them so that they stay piled up.

7.) Keep your heating lamps and food dishes handy. We’ll be getting your crickets into the breeder tank before we set those up.

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Photo 1: 10-gallon aquarium with screen top. This tank has been moved to the floor.
floor for the sake of getting a clear picture, but your tank should be elevated on top of something and NOT directly on the floor.

Photo 2: Nesting box filled with peat moss substrate.

Photo 2: And covered with protective mesh. The sides of the box have also been cut to make it more shallow.
Photo 3: Toilet paper rolls for crickets to hide in.

Photo 4: Bag of peat moss, cardboard egg cartons, nesting box, and a jar lid with cotton for the water source.

Now that you’ve prepared the basic supplies and setup, you’re ready to purchase some breeder crickets.
Choosing Your Breeder Crickets

Selecting a breed

It is estimated that there are over 900 species of crickets inhabiting the world today. Although most of these crickets can be successfully bred, there are only a couple types that are raised primarily as feeder crickets. The two breeds that you will likely find for sale, are the house cricket (*Acheta domesticus*), and the Jamaican field cricket (*Gryllus assimilis*).

Until recently, *Acheta domesticus* house crickets were the only standard feeder crickets being commercially farmed and sold in the United States. Their size, amiability, and tendency to reproduce year round, makes them an ideal choice for large-scale breeding. However, within the past few years, a virus known as the Cricket Paralysis Virus, spread from Europe to the U.S. and Canada, infecting and killing off large quantities of house crickets. The virus, which only affects the *Acheta domesticus* cricket (and cannot spread to animals or humans), dramatically reduced the availability of the house cricket, and caused panic in the cricket farms and herpetology industry. Finally, after they'd disposed of entire colonies, sanitized, and disinfected to no avail, many cricket farmers turned their attention to a virus-resistant species of cricket: *Gryllus assimilis*, the Jamaican field cricket.

NOTE: No need to freak out! Many pet stores and cricket farmers are still breeding and selling healthy house crickets. However, their numbers have decreased as more and more farmers make the switch to *Gryllus assimilis*.

*Gryllus assimilis*, the Jamaican field cricket, is a type of brown cricket that is very similar to the house cricket. These crickets are slightly larger, higher in protein and fiber, and completely resistant to the house cricket virus. You may see pet stores and suppliers marketing these insects as “super crickets”. Jamaican field crickets have also earned themselves the nickname “silent brown cricket”, because their chirp is much quieter than that of the common house cricket.

BEWARE, IMPOSTER ALERT:
Always verify with your supplier to confirm what species they are selling you! Since the virus outbreak, there have been incidences of suppliers distributing an unidentified species, falsely labeled as *Gryllus assimilis*. The unidentified species may be native in California, but is illegal to ship across state lines without USDA approval. These imposter crickets are larger and more aggressive than authentic *Gryllus assimilis*. People are referring to them as “crazy reds” because they bite humans and lizards, and the adults have a reddish tinted head and upper thorax. On the contrary, TRUE Jamaican field crickets have a dark brown or black upper thorax and head. In young crickets, it may be difficult to tell the difference, but the coloring becomes very obvious in adults. If your adult crickets
have red coloring around the head and upper thorax, you may be dealing with unidentified, “crazy reds”.

If you are buying *Gryllus assimilis* from the U.S., make sure that the supplier has USDA approved, correctly identified, Jamaican field crickets.

Pictured: Authentic, brown *Gryllus assimilis*. Some will have more black on them.

*Ordering the Right Size*

When you go to buy your first breeder crickets, you should purchase the ones that measure ½ inch long. Typically, these are about 4 or 5 weeks old and 75% mature. Since they won’t be capable of breeding for another week or two, this gives them time to get comfortable with your setup and adjust to the new habitat. As soon as you receive the breeder crickets, you’ll want to put them into your adult breeder tank. They cannot survive very long in the containers that they
arrive in.

**Sexing**

It is very easy to tell the difference between male and female crickets. Females stand out because they have a long stinger-like tube protruding from their abdomens. This is their ovipositor, or egg-laying organ. When you are setting up your breeding environment, you want to have a ratio of more females than males, so that the maximum amount of eggs can be laid. To do this, you'll pick excess males out of the batch and feed them to your pets first.

**Completing the Setup**

Now that you have your breeder crickets, it's time to continue with the setup. So you have your tanks, lined with clear packaging tape on the insides, and set in an ideal location, elevated above the floor. You've filled the nesting box with substrate, covered it with wire mesh, and placed it inside the breeder tank. You've added the cardboard egg crates or paper towel rolls and stacked them up in a crisscross manner. You've just received your crickets and removed extra males out of the bunch. You are ready to take the following steps:

1.) Wet the cotton batting or sponge so that it is fully saturated and place it in your shallow bowl or jar lid. Place the lid or bowl with the batting or sponge into the tank. This is the water source for the crickets.

2.) If you bought commercial cricket chow, pour this into the empty cream cheese container (or whatever you are using for a food dish). If you are using dry cat food or dog food, you'll need to mash up the pellets into a finer grain that the crickets can fit in their mouths. Then pour the mashed up pellets into the food dish. Place that inside the tank. This is the food source for the crickets.

3.) Attach the heat lamp to the top of the aquarium and turn it on. If you have a thermometer (recommended), affix that to the inside of the tank. Depending on the temperature of the room, and the size of your tanks, you may need two lamps to maintain the desired temperature. Adult crickets need the temperature to be at least 75°F to grow and stay healthy, while eggs and nymphs need it to be 85°F to 90°F. Many breeders keep it at around 85°F for both adults and nymphs, because this speeds up the reproduction cycle. Higher temperatures increase the maturity rate of the crickets, but also decrease the life expectancy. It's up to you to decide how fast or slow you want your crickets to reproduce and mature. For beginners, it may be easier to keep the temperature on the lower end so that the crickets do not end up reproducing faster than you can move and distribute them. Your heat should be turned on for about 12-14 hours a day in general. If your house temperature is on the chilly side, the lamp may need to burn longer.

Your adult cricket breeder tank should now be complete. You've added the final
necessary items: food, water, heat, and four to five week old crickets. Within one to two weeks from now, you should see your crickets mating. You'll see the females sticking their ovipositors into the mesh of the nesting box to lay their eggs. Before we talk about incubating the eggs and rearing the hatchlings, we're going to discuss cricket nutrition in further detail and go over your day to day, cricket-keeping responsibilities.
Cricket Diet & Nutrition

Although commercial cricket chow and dog / cat / chicken feed work well as a bulk starter diet to feed your crickets, there are healthier foods that you should eventually incorporate into the mix. Your crickets can enjoy a variety of dry organic foods in addition to fresh fruits and vegetables. You can pick some dry foods and also offer a couple fresh foods to give the crickets a balanced meal. The more of these you add to the base diet, the healthier and stronger your crickets will become.

These are the **best dry foods** to add:

* Mixed Seeds and Nuts (unsalted and raw sunflower seeds, pumpkin seeds, crushed peanuts, almonds, cashews, and pecans)

* Alfalfa (course ground or powdered form)

* Wheat Bran

* Whole Grain Oats

These are the **best fresh foods** to add:

* Greens (romaine lettuce, collard greens, mustard greens, dandelion leaves, broccoli)

* Potatoes (a cricket favorite)

* Carrots

* Fruits (apples, oranges, grapefruits, berries, mangoes, papayas, bananas)

Dairy products can also be included as part of the dry or wet food sources. Dry milk is often used as an ingredient in gut load recipes. *Gut loading* is a term used to describe the process of stuffing your crickets with lots of nutritious food, right before you feed them to your pets. Typically, a gut load consists of a mixture of all the healthiest foods that you are already feeding to your crickets, plus some additional bonus items. The difference between regular feeding and gut loading, is that when you gut load, you are combining multiple types of foods together in order to overload the nutritional value. Crickets should be served a gut load each day during the last few days before they are fed to your pet.

The main point in offering these specific foods to your crickets is that they include the right amount of protein, calcium, and other essential vitamins and minerals.
that pass on to your reptiles.

Here are a few gut load ideas you may want to try:

**Calcium Power Plus**

**Ingredients:**

1lb Quaker Oats  
1lb milk powder  
1lb wheat bran  
3 lbs ground IAMS Kitten food

**Directions:** Using a food processor or blender, mix 1 part of the above ingredients with 3 parts of a calcium supplement for a high calcium meal that will turn your crickets into nutritional powerhouses for your pets.

**Banana Nut Crunch:**

**Ingredients:**

5 bananas  
1 cup almonds  
1 cup rolled oats  
1 cup fish flakes  
1 packet baker's yeast

**Directions:** Blend the above ingredients in a food processor or blender.

**Seed Mixer:**

**Ingredients:**

1 cup flax seeds  
1 cup sesame seeds  
1 cup organic raw sunflower seeds  
1 cup poppy seeds  
1 large yellow squash  
1 large zucchini

**Directions:** Blend 'em up!

Note: Each of the above gut load ideas features estimated ingredients. You may have to experiment with portion sizes to discover which ones make the right amount of gut load for your needs. Excess gut load can be frozen and then defrosted and served when you are ready to use it again.
If it is not convenient or possible for you to prepare your own homemade gut load mix, you can purchase commercially produced cricket diet supplements and prepackaged gut loads from a variety of well-known cricket farmers and pet retailers. However, since mass produced gut loads are dry, you should not rely solely upon them. Your crickets will still need fresh fruits and vegetables on a regular basis, and as a part of their gut load.

Since crickets are naturally omnivorous scavengers, you must carefully monitor what they have available in their tanks. They'll eat whatever is accessible, even if it is not good for them. In general, you'll only need to replace the dry food mixtures about twice a week. Fresh food, on the other hand, will need to be replaced and replenished on a daily basis.

Photo: Crickets enjoying fresh greens and fruit bits.

Now that you understand the basics of cricket nutrition and your adult breeder crickets are in their tank, let's take a look at what your regular care schedule should be.

**You should do the following every day:**

* Check the food and water. If the sponge or cotton is drying out, you'll need to dampen it again or replace it. If dry food levels are low, add more. If any fresh food is spoiling or uneaten from the previous day, remove it.
* Check the temperature of the tank to make sure the light bulbs or heat lamps you've chosen are sufficient. If the tank is not staying warm enough, you may need a bulb with higher wattage, or an additional lamp. You may even want to look into reptile heating pads.

* Remove any dead crickets. If a dead cricket is found in the food dish or around the water source, you'll need to take it out and then replace the water source (with a different sponge) and food dish.

* Look at the substrate in the nesting box to see that it is moist. Use the spray bottle to mist it with water if it appears dry. The eggs need moisture in order to develop and hatch. Be careful only to mist it if it looks dry. Too much water can drown the eggs, but too little can cause them to dry out. Peat moss will likely need to be sprayed more often than vermiculite. Use your best judgment, but don't feel bad if you make a mistake. As with anything, practice makes perfect. With experience, you'll get good at telling if the eggs need more or less moisture.
Incubation & Rearing

Separating the eggs from the adults

While your four to five week old breeder crickets are adjusting to their new environment, you should be preparing the second tank which will be used for egg incubation and nymph rearing. By the time your breeder crickets reach 6 weeks of age, they will be mating and laying eggs. The eggs are oblong and have a yellow tint. Since they are laid a few inches deep into the substrate, you probably will not see them. Occasionally you'll find some eggs that have been laid near the water dish instead of in the nesting box. Don't worry about those; they will not be able to hatch.

You'll begin to see female crickets sticking their bottoms through the nesting box mesh. A few days to a week after you notice this, you'll need to remove the nesting box from the adult breeder tank, remove the mesh from the top, and place it into the second tank for egg incubation. In the meantime, your adult breeder crickets will only have a couple weeks left of their lifespan. It is up to you to decide whether you want to set up another nesting box to allow them to continue laying eggs, or just feed them to your pets. It depends how many crickets you want to have. You can end up with thousands if you do everything right.

The egg incubation / rearing tank should be set up similar to the adult breeder tank. There should be egg crates piled up for the baby crickets to enjoy when they hatch. The temperature needs to be at least 86°F for the eggs to incubate. You can accomplish this by using reptile heating lamps or heating pads. Extra humidity is also necessary. Constantly check the nesting substrate to ensure that it is not dried out.

At 86°F, it takes about two weeks for cricket eggs to hatch. When the baby crickets are first born, they'll be very tiny; they are not called “pinheads” for no reason. They'll look exactly like an adult cricket in shape and form, only much tinier, lighter in color, and wingless. Since the babies are so small, you should use fresh fruit as their water source. It is too easy for them to drown in a dish or bowl of water. You can feed them all the same foods you feed the adults. Baby crickets love potatoes. Also, remove the nesting box from the tank after all of the eggs have hatched.

It takes 4 weeks from birth for crickets to reach adult sizes, and 6 weeks from birth for them to begin breeding. As young crickets grow, they go through several instars or developmental stages. After each stage, they molt their outer exoskeleton shell and grow a new one. Right after a shedding or molting, crickets will have a light color that lasts for a few hours until the new “skin” hardens. During this time, they are extra vulnerable to cannibalism and injury.
from other crickets. The best you can do to prevent this is to remove all of the dead molted layers from the tank as soon as you spot them.

When the crickets approach 5 weeks of age, you should start looking at your male-to-female ratio. Selectively feed excess males to your pets so that you end up with more breeder females than males. As they get closer to 6 weeks of age, you should supply them with the nesting box. Now, the rearing tank becomes the adult breeder tank, and the tank that originally served as your adult breeder tank, becomes your egg incubation and rearing tank. This is much easier than moving crickets from tank to tank. The mature crickets will mate and lay eggs in the nesting box, and you'll repeat the process of moving the nesting box into the other tank for incubation. The cycle repeats itself.

Just to recap, these are the steps you will take after your adult crickets mate:

1.) A few days to a week after you first see the females laying eggs (sticking their ovipositors in the nesting substrate), remove the nesting box, take the wire mesh off of the top, and place the box into the separate tank (so the eggs have their own incubation home).

2.) Use your heat lamps or reptile heat pads to keep the temperature of the incubation tank at least 86°F.

3.) Monitor the tank every day to make sure the temperature is right and the egg substrate is moist. If the substrate looks dry, mist it with water.

4.) Keep checking for pinhead hatchlings. On average, the eggs hatch within 2 weeks of being laid (at 86°F).

5.) Make sure the tank is set up with piled egg cartons or toilet paper rolls, and food for the hatchlings. Only use fresh fruit as the water source, until the crickets reach 4 weeks old (to prevent drowning).

6.) Once the crickets have all hatched, remove the nesting box from the tank. You'll be covering it with mesh and using it again later when these crickets mature.

7.) As the young crickets grow, continue to remove any molted exoskeletons that you see on a daily basis.

8.) When the crickets are 5 weeks old, or you begin to see an ovipositor on the females, control your male-to-female ratio by feeding males to your pet first.

9.) At around 5 to 6 weeks, provide the maturing crickets with the nesting box. You should dump out the old substrate, pour in fresh substrate, and cover it again with wire mesh.
10.) They'll begin breeding and laying eggs so that you can repeat this entire process.
Potential Problems

Any time you are dealing with living creatures, there are things that can potentially go wrong. Crickets are especially sensitive to their environment, which means that you must take attentive care to ensure that they stay alive and healthy. The good news is most problems that cricket breeders face are entirely preventable. In this chapter, I'm going to talk about the main reasons that crickets die prematurely, and what you can do to prevent a disaster from happening. We'll discuss the danger of parasites, viruses, suffocation, ants, drowning, and cannibalism. By the end of this reading, you will know everything you need to know to keep your crickets healthy and intact.

Parasites – The Enemy Flies and Worms

On a warm summer night in the southern U.S., an unsuspecting field cricket sings his mating call. He chirps and chirps, and waits for a female cricket to approach him. Surely, his song is mighty enough to find a mate tonight. Surely, she will carry on his genetic code. Surely, he will fulfill his biological instinct. He feels the weight of something on his back. There's a stinging sensation in his body. Something is terribly wrong. But it's too late now. A tachinid parasitic fly, known as *Ormia ochracea*, has responded to his chirp. She has dispersed her young larvae on top of his body and flown away. His fate is now sealed as the larvae burrow their way inside of him and claim their host. In seven to ten days, he shall die a brutal death as the developed larvae burst out of him.

Though there are many types of parasitic flies that are a danger to crickets, the *Ormia ochracea* is unique in that it has acute hearing and can specifically target male crickets by the sound of their chirp. Scientists have studied the behavior of crickets in areas where the *Ormia* population is high, and they've discovered that some crickets have stopped chirping in order to protect themselves from this parasite. In fact, it's not quite that they've chosen to stop chirping, but that they've ceased to develop the jagged-textured wings that they need for producing sound. Many of these crickets no longer have the ability to chirp. It's an evolutionary occurrence that is intriguing and mind-boggling. Scientists are still searching for evidence of how these crickets will attract a mate without chirping. Nevertheless, not all crickets have evolved to this degree.
If you think the *Ormia* fly sounds scary, wait until you hear about this next parasite: a hairworm that uses mind control to force crickets to commit suicide. These types of worms are named after the legendary Gordian knot because they are known to tie their long bodies into a knot. The Gordian larvae infest cockroaches, beetles, and all types of orthopterans, including crickets. These worms are often found living in damp areas. They are skinny and long (up to 100 centimeters). A species of Gordian worm called *Spinochordodes tellinii* causes its cricket and grasshopper hosts to drown themselves by jumping into any nearby body of water. Once underwater, the worm will emerge from the host. If there is no water nearby, the worm will emerge without it and the cricket will die in the process. It's a hideous thing to witness. If you are not faint of heart, you can do a search for “cricket parasite” on YouTube and watch video footage that documents this.

**What Can You Do?**

Thankfully, if you purchased your crickets from a reputable supplier, the odds are low that they'd contain parasitic flies or worms. Crickets are always at risk though. You should keep the lid on the cricket tank at all times when you are not feeding or cleaning. If the tank has a screen lid, make sure that the screen mesh is tight enough to keep small flies out. Any holes in the enclosure should be covered with a tight wire mesh and any cracks need to be sealed. If you find worms or flies in your tank, you should set all the crickets free, disinfect the entire setup, seal whatever holes there are, and start over with new crickets. It is not worth the risk. If you mistakenly give your pet a parasitic cricket, make a vet appointment immediately.

*Non-parasitic Threats*
As nasty as parasites are, even non-parasitic insects can pose a threat to crickets in more than one way. Not only do they carry germs, but they can lay eggs in a cricket’s habitat. Maggots that hatch in a cricket’s habitat, can eat the crickets and the cricket eggs. The best way to prevent harmful maggots from entering your cricket cage, is to keep flies out. Preventative measures also involve keeping the inside of the tank as clean as possible. You should be removing spoiled food, dead crickets, and anything else soiled or contaminated on a daily basis.

NOTE: Harmless “Cleaner” Beetles

If you find black, fuzzy looking larvae or beetles with your crickets, they are most likely Dermestid beetles. Many commercial cricket breeders actually use these beetles to eat their dead crickets. They are harmless carrion feeders (they only eat dead flesh) and are generally nothing to be too concerned about. If you have many of them, it may be irritating to open the tank (the adult beetles like to fly in your face).

Ants

It is very common for ants to invade cricket enclosures, and many a cricket colony has been lost due to ant invasions. They are attracted to certain types of cricket food and will eat the eggs and crickets too. So how can you keep them away? There are a few methods that can be used to prevent ants from crawling into your cricket tank. Some breeders place their cricket tanks on top of a bin of water so that there is a moat surrounding the tank. The concept behind the moat is that ants are unable to get to the sides of the tank without drowning in the water. Personally, I do not recommend this particular method. The water can cause an assortment of other problems such as mold, mildew, and water based bacteria or parasites. Other breeders use anti-ant insecticide spray to clean the entire area around the cricket cage. I don’t recommend this method either, except as a last resort. Any time you use insecticide in close vicinity to your crickets, they are at risk for being affected by it. The healthiest way to keep ants away from your crickets is to surround the base of the tank with a sticky substance. Petroleum jelly and cooking oil both accomplish this well.

Cannibalism

Crickets have a tendency to eat their fellow kin and even their own bodies for survival. They’ll express cannibalistic behavior if their environmental conditions allow it. Overcrowded living quarters, insufficient nutrition, unsanitary enclosures, and chilly temperatures are all common triggers for cannibalism.

In the wild, crickets do not live together in colonies. They are territorial creatures that require plenty of individual space. The egg cartons that you place inside the tank contain little compartments which allow crickets to each have their own spot. Problems occur when there are too many crickets in one tank. To avoid
overstocking, limit your tanks to 250 crickets per a 10-gallon space. More crickets means less room for each one. Less room means additional stress and cannibalism. Extra egg cartons can also be added to provide more hiding space.

Ensure that your crickets are well fed and that you incorporate enough protein into their diets. Crickets suffering from protein deficiency will eat anything they can find, until their hunger is satisfied. Refer back to the Cricket Diet & Nutrition section of this book for the best foods to feed your crickets. Most of the items on that list contain healthy amounts of protein.

Unsanitary conditions are another major cause of cannibalism in crickets. If dead crickets or molted exoskeletons are left in the tank, crickets will eat them and then look for more. When there are no more, they turn to their living brothers and sisters. Smaller crickets and crickets that are in between molts are especially vulnerable to attack. Remember to remove all dead bodies and molted shells every day. We'll talk more about cleaning and maintenance in the next chapter.

Tank temperatures cooler than 75°F also contribute to morbidity and cannibalism. Young crickets are immobilized by excess cold, while mature crickets are made more active. Naturally, this gives the older crickets a distinct advantage, and puts them in the perfect position to dominate and cannibalize their younger, weaker cage-mates. If your cricket-keeping room is liable to frequent temperature changes, you should monitor your tank heating lamps and thermometers closely. If necessary, you may need to obtain bulbs with higher wattage.

Viruses

In an earlier chapter, we discussed the detrimental effects that the Cricket Paralysis Virus has had on cricket farms across Europe, the U.S., and Canada. Since Achet a domesticus (house crickets) are the only type of cricket affected by the virus, most breeders dealt with the issue by switching to a different species of crickets. In many farms, Jamaican field crickets have replaced house crickets. If you remember, though, there are still breeders that are raising and selling healthy house crickets today. It is unlikely that you'll receive virus-ridden crickets from reputable suppliers. Yet, if your crickets keep dying, and they are the Achet a domesticus species, and you are sure nothing else could be the reason, then CPV is certainly a possibility. If you suspect that you received CPV-infected crickets, report your experience to the breeder and then buy your crickets from somewhere else, preferably from a supplier that sells Jamaican field crickets (Gryllus assimilis).

Suffocation & Drowning

Poor ventilation and excess amounts of water are two of the biggest reasons that rookie cricket breeders see high fatality rates among their colonies. While it is very convenient to raise your crickets in a plastic storage container, it is
imperative that the containers are modified to allow adequate airflow. If you are using a plastic lid for your cricket bin, you should cut a large rectangular hole in it, and cover it with mosquito screen mesh. If the cricket room is stuffy, turn on a fan to help with the air circulation (just don't put it too close to the cricket home or the eggs might dry out).

To prevent crickets from drowning, do not fill the water dish more than ¼ inch deep, and always include a sponge or cotton ball so that the crickets have something to climb out on. If crickets are still drowning, do away with the dish and only offer the wet sponge or cotton by itself. If you don't have a sponge or cotton, a soaked ball of paper towels can be used. The paper towels will need to be dampened more frequently than a sponge or piece of cotton. Remember never to put a dish of water in a rearing container of hatchling crickets. They are too tiny to drink from a dish and will surely drown. Instead, stick to using fresh fruit for their hydration, and replenish it daily.

*Cricket Odor*

The hot and humid atmosphere that crickets live in can cause them to develop a very strong stench. Usually, you won't smell it unless you open up the tank. If you are able to smell a stink just from entering the room, your conditions in the tank are inadequate. The odor can be reduced by regular cleaning and maintenance which we will discuss in the next chapter.

*Cricket Escapes*

When you've got hundreds or thousands of crickets living in a room in your house, the odds are inevitable that one (or a few) will escape despite your best efforts. Whatever you do, don't put an “escaped” cricket back into the breeding container! If you find a cricket loose somewhere in your home, set it free outside. Once a cricket has escaped from the sanctuary, it is no longer sanitary. If this cricket was exposed to a parasite or infection of some kind while it was loose, putting it back into the container may contaminate the entire colony.

*You can do it!*

As intimidating as these cricket problems may seem, it is very easy to avoid trouble when you follow the easy care steps outlined throughout this book. Keep your cricket cage well ventilated and sealed, remove spoiled food and dead bodies or molts immediately, feed the crickets a nutritious diet, regulate the temperature, and use the right source of hydration for the right-size crickets. In the next chapter, you'll learn the best way to clean and maintain the cricket tanks!
Cleaning & Maintenance

One of the most critical determining factors to the success or failure of your cricket farm is the cleanliness of the cricket tanks. The combination of humidity, feces, molts, food, and dead crickets creates a pungent odor that, when allowed to get out of hand, can stink up the entire room. Aside from the unpleasant smell that it produces, a soiled environment is bad for the health of the crickets. Moisture and decaying matter make ideal bacterial breeding grounds. To reduce odor and keep your crickets as healthy as possible, you'll want to follow a few routine cleaning and maintenance procedures. In this chapter, we'll talk about the best practices for cleaning, as well as the safest disinfecting agents that you can use to avoid harming your crickets.

There are a few ways you'll maintain the tank. First, you'll regularly replace and refresh items such as the water source, egg cartons, toilet paper rolls, and foods. Water and fresh food should be checked on a daily basis, and anything soiled should be removed. If you are using soaked cotton batting, it will need to be replaced every few days. Egg cartons that are excessively wet or soiled with feces should also be removed and replaced with new ones. To get crickets off of the egg cartons, you can give them a gentle shake. Better yet, you can find a temporary cricket holding container and shake the egg cartons off in there. That way, you'll be shaking out the cricket poop into the separate container instead of in the tank. Then you can get the crickets to climb on new toilet paper rolls or egg crates and transport them back into their tank. As reiterated in previous chapters, you'll also want to remove any molts or dead crickets as soon as you find them.

At least once every week, you should do a complete disinfecting of the tanks. You'll need a spare container to put your crickets in while you wash each tank. Once again, you can easily get crickets into the spare container by pulling out the egg cartons (which will have many crickets climbing on them) and shaking them off into the container. Repeat this until all crickets are in the separate container. Take the food, water, and nest box out. Now you can wash the inside of the tank. There is no one-size-fits-all method for washing cricket tanks. There are breeders who swear by hot water alone, and there are those who use a bit of mild soap. Crickets are extremely sensitive to chemicals, but using water alone does not quite get rid of odor. In my opinion, it is best to stick to one of the following two methods:

1.) Weak bleach solution - Use about 1 part bleach to 16 parts water to create a solution that is just strong enough to disinfect and deodorize the tank without leaving harmful residue. Rinse it out thoroughly.

or

2.) Hot water & Vinegar - Vinegar is a natural, non-toxic disinfectant and
deodorizer, and the safest ingredient you can possibly use around your crickets and pets. Unless you have an abhorrence or allergy to vinegar, this really is a great, worry-free way to clean cricket cages.

Photo: White vinegar is your all-natural secret weapon.

After washing and rinsing well with the diluted bleach solution or vinegar, either allow the tank to air-dry, or wipe it dry with a cloth or towel. Then you can place everything back in it, including the crickets.

Another important part of cricket maintenance involves replacing the substrate in the nesting box after each round of crickets is born. You can probably get away with reusing substrate a few times, but you'll increase the risk of bacterial infections or worms if you don't replace it often enough. When you empty out an old portion of substrate, wipe down the inside of the nesting container. If you are using a plastic container, you can rinse it in hot water. If you are using cardboard, you will have to throw the entire box away when the cardboard starts disintegrating (and replace it). Discarded nesting substrate and cricket feces may be used as plant fertilizer.

Light bulbs for your heating lamps will need to be replaced as needed, and any electrical wiring should be checked for safety at least every 6 months.
Feeding Crickets to Reptiles

Cricket farms used to primarily sell crickets to fishing bait shops, but today the exploding reptile pet industry is responsible for the bulk of their sales. Each year, more and more people are choosing reptiles for pets. This is not surprising, since reptiles are convenient, affordable, and fun to raise. Depending on the specific reptile that you own, you’ll go about preparing your feeder crickets in a slightly different manner. In general, you'll need to pick the right-size crickets, gut load them, and dust them before feeding them to your pet.

Picking the Right Size Crickets

It's necessary to feed your reptile crickets that measure in proportion to his own size. If you have a baby lizard, it is not a good idea to feed him adult crickets because they can bite him and will be more difficult for him to eat. Most of the time, a young reptile will not attempt to eat a cricket that is too big. Yet, if the reptile is feeling bold, it may take a chance and end up choking on the cricket. As a general guideline, you can look at the space between your lizard's eyes. Feed him crickets that are no larger than the length of that space. If you have many crickets, you can easily sort the different sizes by drilling a few holes into a bucket or pail. Place another bucket underneath the bucket with the holes. Then, put your bunches of crickets into the bucket with the holes and gently shake it a bit. Only crickets of a certain diameter will be able to slip through the holes into the bottom tub.

Gut loading

Using the food guidelines outlined in the Cricket Diet & Nutrition chapter, you can create gut load recipes to nutrition-pack your crickets prior to feeding them to your reptile. You can also buy prepackaged, dry gut loads from most breeders and pet shops. All gut loads should be fed to feeder crickets at least 48 hours before you give the crickets to your pet. Ideally, your crickets should have the gut load available to them every day during the last two days of their life (before they get eaten).

Dusting

Unless you are including a calcium supplement in your particular gut load, you'll want to dust (coat) your crickets in a calcium powder prior to feeding them to reptiles. There are additional vitamin and mineral powders that crickets can be dusted in, but the specifics will vary depending on what type of reptile you own. You can find these supplemental powders for sale in pet stores. To dust your crickets, place them in a plastic bag or container with a small amount of vitamin / mineral powder. Seal the top and gently shake the bag so that your crickets are enveloped in the powder. Give the dusted crickets to your pet immediately.
Cricket Care Overview

Setup

*Keep crickets in a screen-top aquarium, storage bin, or properly enclosed critter cage elevated off of the floor. Line the upper inner walls of the tank with clear packaging tape to prevent crickets from climbing out.

*Have two tanks: one for adult breeders and one for egg incubation / young crickets. When the young crickets grow up, their tank will become the adult breeder tank and the other tank will turn into the new egg incubation tank.

*Keep the tank warm with heat lamps. Monitor the temperature by sticking a little thermometer inside the tank.

*Include egg cartons and paper towel rolls for crickets to hide in.

*Include a nesting box in the adult breeder tank. Fill it with vermiculite or peat moss and cover it with wire mesh.

*Use cotton batting or a wet sponge in a dish as the water source for adult crickets. For hatchlings, only use fresh fruit as the water source.

*Offer a variety of dry food and fresh food.

Daily Care

*Check food and water levels. Replenish as necessary.

*Remove any dead crickets, molts, or uneaten fresh foods that are 24 hours old.

*Make sure the nesting substrate is moist. If it appears to be getting dry, mist it with your water spray bottle.

Weekly Care

*Thoroughly wash and disinfect the cricket tanks. Use the recommended cleaning agents (diluted bleach solution or vinegar).

*Shake the feces off of the egg cartons. Remove and replace egg cartons or paper rolls that are excessively wet or soiled.

Problem prevention

*Keep ants away by smearing the base of the tanks with petroleum jelly or...
cooking oil.

*Keep flies away by using a tight screen mesh lid and sealing any cracks or holes in the tank. Don't leave the tank open when you are not working with it.

*Prevent suffocation by ensuring that your crickets have sufficient airflow in the tank.

*Prevent drowning by using limited amounts of water and a sponge or piece of cotton.

*If you find crickets in your house that have escaped, do NOT place them back into the tank. Set them free outdoors and wash your hands.

*If your crickets catch a parasite or virus, get rid of the entire colony, disinfect everything and start over.

*Always wash your hands after handling crickets and cricket supplies.

**End of Part One**

This concludes Part One of this book, the section devoted to cricket care. In Part Two, you'll learn some of the fascinating science surrounding crickets. But before we move on, I want to remind you of the special bonus I am offering to my readers. As a way of saying thanks for purchasing my book, I have prepared an additional downloadable bonus as a resource to help you in your cricket breeding journey.

To download your free bonus, go to [http://www.cricket-breeding.com/readerbonus](http://www.cricket-breeding.com/readerbonus)

When you download your bonus, you are also eligible to receive free updates of the latest news and research in the herpetology and feeder care industry.

Up until a few years ago, most people did not know about the Cricket Paralysis Virus. It wasn't until after the majority of cricket farmers and breeders lost all of their crickets, that this information finally became mainstream. But why wait for disaster to strike when you can be prepared?

Now you can stay ahead of the curve when it comes to your pet's health.

Get your free reader bonus today at [www.cricket-breeding.com/readerbonus](http://www.cricket-breeding.com/readerbonus)
Part Two: Amazing Crickets

How Crickets Mate

Crickets mate in a very interesting manner. Unlike most species of animals, in which the male mounts the female, cricket sex begins when the female mounts the male!

Prior to mounting, there is some courtship that takes place. (Could you imagine that? Crickets have class!) Female crickets are drawn in by the sound of the male’s chirp; only the males can chirp. Although every male cricket has its own unique sound, there are two types of chirps that play a role in the courtship process. The first type of chirp is called the “calling song”, and this is the one that you most commonly hear on warm summer nights. It is an evenly patterned, loud series of chirps that male crickets use to catch the attention of female crickets. The second type of chirp is called the “courtship song”, and this one is much quieter than the first. The male cricket chirps the courtship song when a female is nearby or approaching. Scientific studies have shown that female crickets are very selective of their mates, and will choose based on the sound quality of his song. The females are able to distinguish a dominant male from a weaker male, merely by the characteristics of his chirp. When a female has decided upon a mate, she will turn her body toward the direction of his chirp. She is able to hear him with her ears, which are located below the knees of her front legs.

When the male and female come into contact, the male releases a white sperm packet and the female climbs on top of him. There is no typical copulation as the male transfers his sperm packet over to the female. Once the female has received the sperm packet, she hops off, and sperm continues to deposit into her for up to 30 minutes. The sperm that enters is stored inside of her until she decides to lay her eggs. At egg laying time, the sperm will release and fertilize each egg as it slides down her ovipositor.

For the common field cricket, mating is over after the female cricket climbs off. Tree crickets, on the other hand, engage in an even more amazing behavior known as “courtship feeding”. Shortly after mating, the male cricket secretes a special fluid from a gland between his wings. The fluid contains nutrients that are meant to help increase the odds of successful reproduction. The female cricket drinks this fluid off of the male’s wings before they part ways. Female tree crickets have even been known to sneak up and drink the nutritional fluid from another female’s mate before the other female gets the chance to take it. How sinister!
According to a recent study done by the University of Exeter, female crickets can mate with as many male crickets as they like, and then choose which male’s sperm will be used to fertilize her eggs. To conduct their study, the researchers bred field crickets in their laboratory, and used DNA techniques to quantify the sperm stored by each female. They then conducted paternity tests to determine which sperm belonged to which male cricket. They found that regardless of how many males a female had mated with, she stored a higher content of sperm from unrelated males. It is believed that the females use their abdominal muscles to control the amount of sperm that is stored for each male they’ve mated with. One theory is that this ability prevents inbreeding, and encourages the best combination of genes. Since most crickets will mate with any relative, this sperm selection mechanism helps prevent the defects associated with too much inbreeding.
Cricket Knights in Shining Armor

*A Tale of Two Crickets*

In the glow of an orange sunset sky, a pair of lovers relax in front of their new home. As they eat dinner and enjoy the fresh air, he reassures her that she is safe with him. He has been singing romantic songs for her all day, and she is charmed. Nowhere in all of the land has she found anyone with a better voice than his. It would be an understatement to say that he had her from the first song. As they stare at each other, face to face, she thinks about the day that their children will be born. She is so thankful to have found the perfect home and the perfect mate. Just as this thought crosses her mind, a blood curdling screech pierces the vicinity and her eyes glimpse something enormous as it swoops down from the sky. With no time to think, she rushes inside. She looks for her love, but he is nowhere to be found. She realizes he is still standing outside, directly in front of the house, directly in the eye of danger. She remembers his pledge to protect her no matter the costs. As the enemy charges through the doorway of her home, it tears him to smithereens and stops just short of her fearful body. It could reach her if it wanted, but it is satisfied. It carries away what is left of her beloved, and soon all is silent.

The story above may seem like a scene right out of a sci-fi movie. If it wasn’t written in a book about cricket breeding, you might never imagine that it is an actual event in the life of a field cricket. Obviously, the descriptions of her thoughts are imaginary. Nonetheless, it depicts an incredible behavior that biologists have recently observed in male field crickets.

Dr. Rolando Rodriguez-Munoz, from the University of Exeter, set up a series of infrared cameras to study a population of wild field crickets, each of which had been individually numbered and genetically analyzed. The cameras were positioned outdoors in the natural habitat of the field crickets, right above their burrows. Each camera recorded hours upon hours of cricket behavior, and Dr. Rodriguez-Munoz watched all of the recorded footage. His discovery? Chivalry is alive and well in the world of crickets.

“*Ladies first*, says Mr. Cricket.

In the camera footage, the male crickets are repeatedly seen outside of the burrow. When a predator approaches, the male waits for the female to enter the burrow first. It is not until after she is safe inside, that he will attempt to save himself. This brief delay often results in the male losing his life. In the study, mated male crickets were four times more likely to be eaten than male crickets without a mate. On the other hand, mated female crickets were six times *less* likely to be eaten than their unpaired counterparts.
There is another significant point worth mentioning. Although scientists have observed that the males of many species of mammals will coerce the females to prevent them from mating with other males, this is not the case for crickets. Male crickets showed zero signs of attempting to control their mate’s behavior. A female cricket could wander and mate with other males, and her burrow mate would not attempt to stop her. The only time the male displayed aggression was when another male attempted to enter the burrow. This, however, is most likely attributed to the territorial nature of crickets.

The interesting thing about Dr. Rodriguez’s experiment is that he conducted the study in the natural habitat of the field crickets and not in a lab. His findings are unique compared to biologists who have done laboratory-only studies. The male cricket’s chivalrous behavior has never been observed before in the various lab tests that have been performed over the years. The “ladies first” motto that these crickets display is a remarkable phenomenon.

Warrior Crickets

For decades, scientists have studied aggressive behavior in crickets. Male crickets frequently engage in territorial battles, as well as battles over prospective mates. If you place two male crickets in a container together, initially they will both avoid each other. If the two males have already fought in a different instance, then there is preexisting dominance, and the subordinate male will run from the other. If there is no preexisting dominance, then the males may ultimately face each other and engage in antennae fencing. After a bit of antennae fencing, they may lock mandibles and wrestle. Fights between male crickets can go on for a considerable amount of time before one of the crickets surrenders. The losing cricket turns away to avoid the dominant winner. It is important to note that the aggressive behavior of crickets can vary through each of the unique species. For example, *Acheta domesticus* are naturally more social than many of the *Gryllus* types of crickets. Cricket species that live more solitary lives are likely to express increased levels of aggression.

In Chinese culture, it is a longstanding tradition to watch and bet on cricket fights for entertainment. It traces back to the Tang Dynasty, but is as popular as ever today. According to an article in the November 2011 *New York Times*, China spends about $63 million per year on raising and keeping crickets for the purpose of cricket fights. Interestingly enough, biologists have recently proven the validity of an 800-year-old Chinese text which states that the best cricket fighters have the largest heads. Researchers from the University of Toronto Mississauga, have discovered that male crickets with disproportionately large heads win fights more often. This is accredited to the fact that a larger head is usually accompanied by larger mandibles.
The Cricket Chirp

There's a common misconception out there that crickets chirp by rubbing their legs together. Although this is not too far-fetched, it is incorrect. Male crickets actually create their songs by rubbing their forewings together. One side of the wings contains a jagged texture. When the smooth side of the wing rubs against the rough side, it acts as a stridulating organ and produces the chirp sound. Various factors such as species, temperature, body size, and age, affect the rhythm and pitch of the chirps. Crickets also vary their chirping speed depending on the purpose of the chirp. For example, a cricket that is engaging in a fight with another cricket will chirp more vigorously than a cricket attempting to attract a mate.

Temperature is one of the main factors affecting the rate of a cricket's chirp, and scientists have found specific formulas that can be used to calculate the temperature merely by counting the amount of cricket chirps heard every few seconds. Some species of crickets are more accurate than others, when it comes to predicting the temperature. The Snowy Tree Cricket has been nicknamed “poor man's thermometer”, because of how well its chirps correlate to the current temperature. One formula for calculating the temperature is to count the amount of chirps heard within a 13-second time frame. Then, add 40 to that number. The sum is the temperature in degrees Fahrenheit. Pretty cool, eh?

While the community has known about the counting method for years, researchers from the University of Bristol have recently (April 2012) published the results of a new study that explains how we can predict the temperature by the pitch of a cricket's chirp too. Though most crickets, individually, only chirp in one pitch or note, a particular species of tree cricket, Oecanthus henryi, changes the pitch of its chirp based on the temperature. Since this species has wings that are longer than they are wide, it is able to generate multiple notes instead of just one. When it's 81°F, Oecanthus henryi sings at 3.6 kilohertz and when it's 64°F, it sings at 2.3 kilohertz. Scientists are still baffled over how this pitch alteration affects female mate selection.

In most cricket species, the pitch of the chirp relates to the age and size of the cricket. Luke Verburgt, from the University of Pretoria, recorded the mating songs of a group of crickets when they were 10-12 days old and then again when they were 48-50 days old. He analyzed the song traits and found that they changed with age. Young male crickets chirped louder, with a higher pitch. To test whether females preferred the younger or older chirps, Verburgt played the songs for a bunch of female crickets and documented which direction they turned. He found that the females turned toward the sound of the younger crickets 90% of the time. The biological reason that females did not choose the older crickets is probably because older males produce less sperm and are more prone to have sperm with genetic mutations.
Furthermore, biologists have found that female crickets remember the sounds of other males that they've heard, and make their future mating decisions based upon these memories. Lab researchers, Nathaniel Bailey and Marlene Zuk, discovered that females were less likely to be attracted to average males after they had heard the sound of an attractive male. The research was conducted using hundreds of field crickets. In the experiment, all female crickets were exposed to an average male cricket song. If a female responded to the song, the researchers considered that the female found that song attractive. Next, the researchers took a group of female crickets who had heard attractive songs and gathered them with other females who had heard unattractive songs. Bailey and Zuk discovered that the females who had heard unattractive songs responded more strongly to the average male song. These types of findings show that insects are much more complex than people tend to think.

Most evidence seems to indicate that a cricket's chirp is a highly significant part of the cricket reproductive cycle. Yet, when we take a look back at the issue of cricket parasites, do you recall the Ormia fly mentioned in the Potential Problems chapter? This fly targets male crickets by the sound of their chirp. An entire population of crickets in Hawaii has evolved in order to defend against this danger. The majority of the crickets lost their ability to chirp, and yet their numbers have not reduced. This raises questions regarding how they are able to find mates without chirping. One theory is that the females of the species have also evolved so that they no longer require a courtship song. Another idea is that perhaps the females mated with the silent males because they were the only ones left after the parasite killed off the singing ones. Either way, it is amazing that these crickets were able to change their entire method of courtship and reproduction.

The cricket auditory system is also complex. A cricket's ear consists of two ear drums, located on the forelegs, connected to a series of tracheal tubes and 70 auditory receptors. This system is what allows crickets to not only respond to the chirps of potential mates, but to also escape from predators such as bats. The cricket's ability to hear a high range of frequencies is especially helpful when it comes to recognizing a bat's echolocation call. Studies have confirmed that a cricket rapidly moves away from the direction of any sound that resembles the echolocation. What is even more remarkable is that a cricket will respond even if its ears are removed. Several students at the University of Bowdoin have discovered that a cricket can regenerate its auditory receptors. Each of their crickets had one ear removed. After one ear had been removed, all of the crickets developed new dendrites (branches attached to neurons) which grew across to the mid-section of the cricket to meet and communicate with the ear on the other side. It is only the beginning in this branch of research, and the researchers hope that further investigation will offer clues as to how exactly the auditory nerves are able to regenerate. In the future, this understanding may be useful for treating other living creatures, including humans.
Final Words & Bonus

By now, you know more about crickets than you even need to know in order to raise them successfully. The main section of Cricket Breeding Made Easy, was written to provide you with the absolute easiest and safest method for breeding and raising your own feeder crickets. The steps outlined in this book were written with problem prevention in mind. I have used a combination of real life experience and science based research to come up with the breeding system outlined in this book. Cricket Breeding Made Easy is meant to minimize the costs and headaches associated with managing your own cricket farm.

The additional scientific information, presented in Part Two, was included not only to be thought provoking, but also to raise awareness of the highly complex beings that crickets really are. Even though you may only be raising them as food for your pet, crickets deserve to be treated respectfully and humanely.

**BONUS**

As a special thanks to you for reading this book, I am offering additional resources for free!

To claim your bonus content, go to www.cricket-breeding.com/readerbonus and fill out the short form.

I look forward to providing you with even more information for your pets.

Until then, happy cricket farming!

Sincerely,

JM Daniels

author of Cricket Breeding Made Easy
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