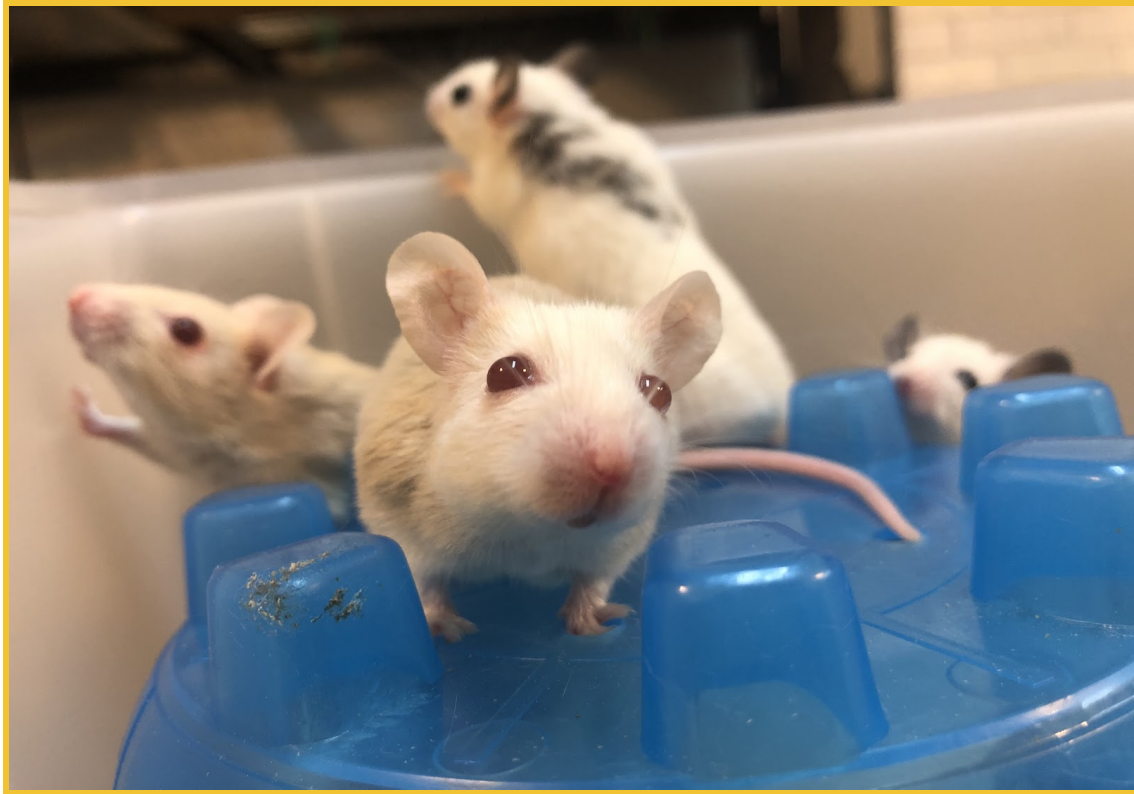


African Soft Fur Care File

Produced by: African Soft Fur (ASF) Breeding Hub
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Introduction

African Soft Fur Rats, as their name implies, come from Africa and are considered to be the natural staple diet for wild ball pythons. This makes them a popular feeder to breed despite not being domesticated like mice or norway rats. For further research, the following terms are useful to find information specific to ASF: Multi's, Mastomys, Promys, Multimammate Rat, Multimammate Mouse, Natal Multimammate Mouse, Natal rat, or *Mastomys natalensis* (their scientific name as of 2020).

The contents of this guide have been compiled from the personal experience of several experienced breeders as well as scientific research done on either African Soft Fur (ASF) Rats specifically or other similar rodent species where research specific to ASF rats was not available. The recommendations contained in this guide are considered the gold standard at the time of writing, but with all creatures there is some variation of what works best. We feel that this is an ideal starting point for those new to ASF or looking to improve their care for their pets or breeders.

ASF have several negative reputations as feeders, but in our experience this is highly variable. One of the two of the most popular reputations include being aggressive, very bitey, or impossible to handle. For the purposes of discussion, we will refer to "lines" of ASF - think of this like the lines of a pedigree dog breed; some are bred to be better guards, some are bred for show conformation, some are bred for unique colors, etc. Most rodents are line-bred within a breeder's facility and after a few generations through intentional or accidental selection different traits will be brought out. Many breeders in our group focus heavily on breeding for a more calm and docile nature to make cleaning or working with them easier for us and less stressful for the ASF. This isn't a trait all breeders work toward, so the source of your initial breeder ASF will depend how true that reputation is.

For ASF bred to be less fearful of humans, they can make fascinating pets to watch in a same-sex colony or easy animals to breed as feeders. We hope to cover the nuances for both pet-keeping and breeding where applicable.

General Care

In this section, we will cover some basics for owning and taking care of ASF. Everything from caging recommendations, bedding options, primary diets, fresh food additions, handling, and daily routines is covered here.

Lifespan

- Females - approximately 2 years
- Males - approximately 2 years
- Recommended to retire breeding adults by 1 year old - beyond this age, females especially are prone to complications and have reduced litter sizes

Housing

ASF are avid chewers and very talented at getting their teeth into anything plastic. For this reason the following enclosures are the most recommended:

- Glass aquariums with a metal mesh lid
- Rodent lab caging (this has a plastic base, but is designed to have no edges an ASF could chew on)
- Rodent racks (professionally built or DIY if you use tubs that have no chew-points and have a very snug fit along the top of the tub)
- DIY Racks must use $\frac{1}{4}$ " hardware cloth mesh - young weaned or hopper ASF can squeeze into or through $\frac{1}{2}$ " hardware cloth mesh
 - $\frac{1}{2}$ " hardware cloth mesh can be used for a food hopper, but it is strongly advised to add a lid over this area made of $\frac{1}{4}$ "; if they shuffle food out of the way or run low, hoppers may climb through the $\frac{1}{2}$ " mesh and the $\frac{1}{4}$ " lid will keep them secure



Example of a lab cage with ASF

Standard hamster/gerbil/rat cages at the pet store are not recommended as the plastic bases are not located in a way that prevents an ASF chewing on it and making an escape hole. Similarly, many of these cages have openings that are too large for young ASF.

Toys & Hides

It is recommended to provide toys and hides for ASF, pets and breeders.

Chew toys, like small pieces of untreated wood or apple sticks found in pet stores work very well. Alternatively, empty paper towel tubes make good chews and hiding spots for young ASF. For the ASF that are interested, hooves and antlers sold for dog chews can also be good enriching chews.

For pets, you can also include wheels which will help keep them busy and less inclined to chew on their enclosure.

It is advised NOT to include most types of wheels with breeding colonies as it is easy for the blind babies crawling around to get caught in them and injured or placed in the wheel by mom and then flung off by another adult when the wheel is used. Flat saucer-type wheels can be used with relative safety (though babies could still get tossed off), but upright wheels with metal bars or mesh are risky for babies. Additionally - some rodents find wheels addictive and mom may become too obsessed and neglect to feed the babies in favor of running; this can cause the loss of the babies.

It is advised to provide wood, plastic, or cardboard boxes as hiding places for ASF; or to provide a small pile of hay to build a more natural nest for themselves. They often prefer to nest in a hidden area and this helps lower stress and keep them feeling secure. Plastic or wood hides from the pet store are good options, as are small cardboard boxes (such as a pop tarts box or similar small box). Avoid the flavored hides at pet stores as many rodents use the flavor to determine it is food and may eat a significant amount of the compacted sawdust which has no nutrition for them and could cause impaction. When chewing, rodents do not typically ingest much of the wood/cardboard, but flavored wood appears to be food to them.

Bedding

There are a variety of rodent beddings on the market, but not all are safe for rodents despite the marketing. Low dust beddings are very important. Acceptable bedding options include any kiln-dried pine shavings (pine sold for animal use is kiln-dried in the US), aspen shavings or chips, hemp bedding, pine pellets, or other hardwood beddings (poplar, maple, beech) if you have them available.



The ideal bedding setup is the following:

-
1. Thin layer of Sweet PDZ (a horse stall refresher product that neutralizes ammonia and reduces smell - safe for rodents)
 2. Layer of equine pine pellets (these are kiln dried pine, compressed into pellets - they will expand into a dense powder that absorbs the liquid so the bedding stays dry and helps reduce the smell)
 3. Layer of kiln dried pine or aspen.
 - a. This can be the larger or smaller pine flakes, or any type of aspen shaving
 4. (Optional) Handful of hay for nesting material (timothy hay, orchard hay, etc.)

The Sweet PDZ and Pine Pellets can both be purchased at Tractor Supply Co. Other farm supply stores will likely have a similar product available and Sweet PDZ can be purchased from Amazon if a local store can't be found (on Amazon the most common product is for chicken coops - just ensure the one you choose does not have any added chemicals, scents, etc.).

Do NOT use Cedar shavings for any rodents - the scented oils natural in the wood are harmful to their lungs and will cause illness over time.

Also do NOT use paper beddings like Care Fresh. Studies have shown that they are extremely poor at absorbing or neutralizing ammonia. In the [Research and Studies](#) section at the end of the guide, we included a link to the study and a screenshot of the table showing the results with Care Fresh specifically to illustrate how poor this substrate performed.

Diet



The dietary needs of ASF rats are not as well-studied as mice or rats, but over many years of breeding, the following foods and combinations have been proven to produce large, healthy litters or successful pet ASF.

Dietary needs for pets vs breeders are slightly different as breeding ASF will need additional protein to keep up with the demands of gestation and rearing litters. Not all of this is set in stone - some lines of ASF appear to do better with a bit higher or lower protein than the amounts below, or do better with more seed or vegetable add-ins than others. This is just a good starting point and you can experiment over time and see what works best for your animals.

Pet ASF Diet should have 15%+ Protein AND 10% Fat or below. The most highly recommended pet ASF diet is Mazuri 6F.

Breeder ASF Diet should have 20%+ Protein AND 10% Fat or below. The most highly recommended breeder ASF diet is Mazuri Rat & Mouse Diet. Many breeders also use Mazuri

6F and use higher-protein add-ins on a more regular basis. Mazuri Rat & Mouse should be sufficient as a stand-alone diet with no additions necessary for most ASF, but Mazuri 6F would likely require some weekly supplementation of mealworms or egg to keep protein levels high enough for nursing or pregnant does.

Be aware that too much protein can be harmful. In rodents, excess protein in the diet can cause damage to the kidneys over time as they don't process it as well. If your base diet is over 20% protein, limit the frequency or amount of high protein add-ins to weekly or only when new litters have arrived.

Both pets and breeders benefit from additions to the diet; if your base diet meets the above guidelines for your situation, these additions are primarily for mental enrichment and variety rather than nutritional need. Unlike breeders, pets may need to have additions given in moderation to prevent obesity. Popular additions include:

- Black oil sunflower seeds (BOSS)
 - Typically offered weekly as a scattered foraging item; offers healthy fats that benefit nursing moms, moms that need to put back on some weight, or growth for juveniles. Adds some protein, but not truly high protein. The primary benefit is from the types of fats and other minerals it offers.
- Cooked egg (scrambled, hard boiled, etc)
 - Typically offered as a protein boost - if you're unsure that you have enough protein and want to prevent that as a cause for babies being eaten, these are often offered to moms just after birth. Can also be used to supplement a lower protein base feed like the 6F formula for breeders on a weekly basis.
- Small bits of cooked chicken or cooked chicken bones (bones are not an issue for rodents like they are for dogs)
 - Meat is best as an occasional add-in for moms that are looking thin after birth or when you're unsure if the protein in the diet is sufficient to prevent babies being eaten.
 - Bones are a good enrichment chew; they aren't especially high in protein on their own, but are good for keeping them mentally enriched and busy for the ones that like them. Bones should have any seasonings or sauces removed to the best of your ability - especially if you aren't sure if the ingredients are rodent safe.
- Mealworms/Superworms & other feeder insects (i.e. dubia roaches and crickets, etc.)
 - Dried worms can be added to the lab block for lower protein base diets; adding some 2 to 3 times a week onto Mazuri 6F will boost the protein and should be plenty for breeding ASF. Weekly is more appropriate for the Mazuri Rat & Mouse Diet so as not to add too much extra protein.
 - Live worms can be added at similar intervals but are best put into the bin rather than onto a food hopper like you can for the dried worms. (If added on top, you may find them elsewhere in your house if they crawl off and away)
- Bird seed mixes or individual seeds including red or white millet, safflower seeds, oat groats, pumpkin seeds, flaxseeds, etc.

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- Seeds or mixes are used primarily as mental enrichment by scatter feeding across the bedding which allows them to express natural foraging instincts
 - Avoid mixes that contain whole dried corn as it can be contaminated with bacteria that can seriously harm rodents - this is typically because it gets into the center of the corn before drying and the drying may not have fully killed it. This is not specific to ASF and can harm other rodent species as well.
 - Avoid any pet bird mixes that contain colored crunchy pieces, particularly if there is any food dye listed (these are not good for rodents and can be fatal for reptiles if their feeders have consumed them - red 40 and yellow dyes especially)
 - Fresh vegetables or small amounts of fruit.
 - This is used for enrichment and variety in the diet - fruit and veggies don't add protein in most cases, but can provide other trace minerals or vitamins as well as something new, fun, and interesting to eat.
 - This is best added weekly, but smaller portions can be offered more often if desired and assuming the amount isn't causing diarrhea.

For breeders, particularly if you are new and are not familiar with the needs of your lines, adding in a protein-rich food whenever you see a new litter is advised (black oil sunflower seeds, cooked egg, small bits of cooked chicken, etc.) and adding in varied treats up to 2-3 times per week can be beneficial. If given daily, some ASF will eat only the add-ins and not eat the rodent block - this is problematic as the block provides a very good nutritional profile for their health and the add-ins won't cover every necessary nutrient/vitamin they need.

For pets 1-2 times a week, adding in small quantities of various extras is good for enrichment (i.e. scatter feeding seeds, BOSS, or mealworms) as well as variety in the diet.

WARNING - when feeding fresh veggies, start with small amounts of the water-rich vegetables like lettuce as a large amount of these can cause diarrhea and dehydration. Diarrhea and dehydration can be problematic, but if a mild case occurs they should be fine within a day or two of their regular diet and 24/7 water access. If it occurs, offer less of the offending item at a time so that it does not recur.

ASF-Safe Fresh Foods

Fresh foods are an excellent way to provide additional nutrition and enrichment to your pets or breeders. However, too much of a good thing can be harmful, so variety is key! No animal should eat a diet of purely kale, for example. Even though kale is full of antioxidants and Vitamin C, it is also very high in calcium, and too much of it can cause a build-up of minerals affecting the kidney and bladder of small mammals. This is why it is important not to feed any one type of fresh food every time - rotate what types you feed wherever possible.

Always make sure that all items listed are collected from known and reliable sources such as your grocery store or own garden, where pesticides and harmful chemicals are not used. Always wash fresh foods thoroughly before offering them the same way you would for yourself.

Leafy Vegetables:

- Arugula
- Basil
- Beet greens *
- Blackberry leaves
- Bok choy
- Borage
- Butter lettuce
- Cabbage *
- Carrot tops
- Chard *
- Cilantro
- Clover
- Collard greens *
- Dandelion greens
- Endive
- Grape leaves
- Grass clippings
- Kale *
- Lemon balm
- Mint leaves
- Mustard greens
- Nasturtium leaves
- Okra leaves
- Oregano
- Parsley *
- Pumpkin leaves
- Purslane
- Radicchio
- Radish tops *
- Raspberry leaves
- Red leaf lettuce
- Romaine lettuce
- Rose leaves
- Rosemary
- Sage
- Spinach *
- Spring greens
- Strawberry leaves
- Swiss chard *
- Thyme
- Turnip greens *

* These plants are high in calcium oxalates and/or goitrogens. Feed sparingly and rotate with other options.

Other Vegetables:

- Beans (cooked)
- Bell peppers
- Broccoli *
- Carrots
- Cucumbers
- Corn
- Green beans
- Lentils (cooked)
- Mushrooms (nontoxic varieties)
- Peas
- Pumpkin
- Radishes
- Squash (all edible varieties)
- Snap peas
- Snow peas
- Sweet potatoes
- Tomatoes
- Zucchini

* These plants are high in calcium oxalates and/or goitrogens. Feed sparingly and rotate with other options.

Fruits:

- Apples
- Apricots
- Bananas
- Blackberries
- Blueberries
- Cactus fruits
- Cantaloupes
- Cherries
- Cranberries
- Figs
- Grapefruits
- Grapes
- Huckleberries
- Kiwi
- Mangos

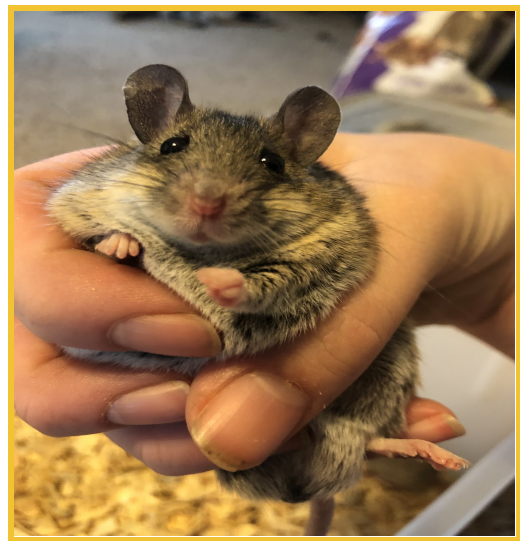
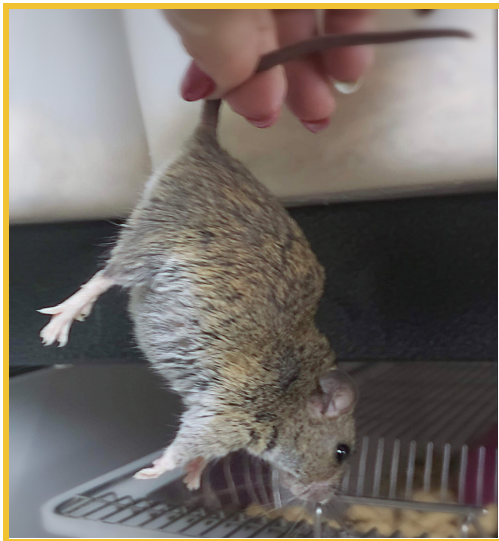
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- Melon (all edible varieties)
 - Mulberries
 - Oranges
 - Papayas
 - Peaches
 - Pears
 - Pineapples
 - Plums
 - Pumpkins
 - Raspberries
 - Rose hips
 - Salmonberries
 - Strawberries
 - Thimbleberries

Edible Flowers:

- Apple blossoms
- Bee balm
- Cactus flowers
- Calendula
- Carnations
- Chamomile
- Clover blossoms
- Dandelions
- Elderberries
- Hibiscus
- Lavender
- Nasturtiums
- Orchids
- Pansies
- Roses
- Sunflowers

Handling

Depending on the line, some ASF can be handled gently like domestic mice or rats by being gently scooped up onto your hands and supported. This is not always the case, so we recommend using the proper Tailing method to pick up or move ASF from lines you are not sure of or are new to you.



To Tail a rodent properly, you need to grip between two fingers at the base of the tail. Use only enough pressure that the tail is not going to slip out of your grip - too much pressure can cause pain or injury; as long as you are careful and using only the amount of pressure needed, it should not cause pain. Additionally, gripping away from the base of the tail can cause pain and injuries like degloving (where the skin of the tail sloughs off).

When moving a rodent by the tail, you should aim to limit the amount of time they are in the air. Have their destination enclosure nearby so they can be lifted and promptly placed back on the ground. If they spend an extended time in the air (more than a few seconds), more skittish individuals may start to experience high stress and flail around or attempt to bite. Flailing and spinning can lead to degloving even when the tail is being gripped in the right spot as they exert more force swinging than when they are not moving erratically.

Young and weaned/hopper stage ASF are prone to jumping - even if your lines are friendly, it is advised to tail this age ASF in lieu of scooping up as they can jump quite far and are very quick. This is as much for your convenience as for their safety - if they jump, a high fall could cause injury or if they manage to get away from you, predators (dogs, cats, large birds, norway rats, etc.), chemicals, or wiring in your house could cause injury or death to them if they aren't found quickly.

Daily Care Routine

1. Visual inspection - open the enclosure and take a look at each ASF.
 - a. For young babies, look for milk bands, healthy coloring, and keep an eye out for any especially sluggish or still babies
 - b. For adults, visually look for any injuries or signs of illness (hunched posture, heavy breathing, poor body condition, warty growths or boney tails) as well as pregnancy in females in a breeding colony
2. Water check
 - a. Verify that there is water in your bottle or water system
 - b. Test that the water nozzle or bottle is clear of debris and is properly dispensing water - lack of accessible water can very quickly lead to deaths in a colony
3. Food check
 - a. Check that there is food available
 - b. Up to 2-3 times per week, offer fresh foods, seeds, or mealworms according to your preference (optional for rodent-specific diets with appropriate protein/fat levels)
 - c. Provide additional protein/fats if you see new babies to help the mother regain some nutrition from her hard work (i.e. - scrambled/hard boiled egg, mealworms, black oil sunflower seeds) (optional depending on your main diet and their needs)

Illness & Injury

Respiratory Infection

Symptoms

- Wheezing or wet sounding breathing

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- Sneezing
 - Weepy eyes/nose

Note - some sneezing when relocating rodents to a new home is normal as they adjust to a new environment. If sneezing is very frequent and persists more than a week or so, it could be a sign of a respiratory infection.

Treatment

The only treatment options for respiratory infections are antibiotics. Most antibiotics are only available through a vet, but some can be gotten as medications sold for fish or birds without a prescription (some can be found on Amazon, while others may need a pet store or farm supply store to source).

The most common antibiotic treatments used on rodents are Amoxicillin and Baytril.

- Fish Mox (Amoxicillin)
- API Fin & Body Cure (Baytril)

If you choose to medicate your own animals, be very sure of the dosages you use. Most antibiotics require a 2x daily dose for 2 weeks given orally.

Eye Injury/Infection



Eye injuries can easily become infected and infections can be deadly. As part of your daily visual inspections, you should keep an eye out for any signs of an abrasion on the eye. These

abrasions can occur from accidental scratches from another colony member, a scratch from a shaving, a fight, or a rough edge on a hide or other piece of decor and can be quite small. It may be easier to notice that the eye is slightly enlarged compared to the other eye, any oozing or goeyness beyond the normal amount for the individual, or any blood or puss on or around the face.

Once you've noticed an issue, you will need to gently clean the area and apply an antiseptic. A warm, damp soft cloth can be used to clean the eye and area around the eye. Betadine (diluted with water to a tea-color, not straight from the bottle) should be gently applied on and around the eye. This process should be done one to two times a day until you no longer see signs of the injury or any infection.

If the eye appears to worsen for more than a day or two after starting treatment, an infection may have set in and it would be best to cull (infections are painful and tend to progress very quickly) or seek a vet for further instructions.

Rodent Papillomavirus (MnPV1)

Symptoms

- Wart-like growths appearing

The visible evidence of papillomavirus initially tends to appear below the chin, near the butt/tail, or along the belly. It is easy to miss early signs or dismiss it as a scab from a minor fight.

These warts will grow and spread across the animal over time. Eventually, they will need to be euthanized as the warts may inhibit eating, walking, or be causing pain and a low quality of life. As far as we know, there is no available treatment for this virus; [one study](#) cites an experimental vaccination, but we don't believe this is something the general public can access and the safety for use as feeders once vaccinated is completely unstudied.

Papillomavirus in ASF is widely considered endemic; meaning that most keepers believe that it is a virus present in most, if not all, ASF populations with the majority of individuals showing no symptoms of the virus as silent carriers. It is thought that it is simply a virus that is exposed from parent to offspring at or before birth and that the immune system can manage the virus unless something happens to cause a weaker immune system. Things like stress (being

brought to a new facility, new caging, drastic diet change, age, unrelated injury, etc.) causing the immune system to weaken and the virus to multiply in their system and lead to symptoms.

Typically, evidence of papillomavirus does not arise without excess stress until the animals reach over 1 year old. In some lines, it begins to show at a younger age (as young as 4 months) and in others it isn't seen until 2 years or more; sometimes it is not seen at all. Since there isn't a fool-proof situation to trigger papillomavirus to confirm its presence in lines that rarely if ever display symptoms, it is unknown if it is simply very common or if it is endemic. Lines that are bred for a pet-quality temperament experience lower stress levels being worked with and this may contribute to some lines having a later onset for papillomavirus symptoms.

If one individual begins displaying symptoms, it is not any more likely for others to display symptoms than they would if none were showing symptoms. If all individuals are older, then they may all start displaying symptoms in a similar time-frame, but it is due to age and not the presence of others with visible symptoms.

Dehydration

Symptoms

- A boney tail where the "rings" of vertebrae are visible or felt easily
- Skin that doesn't "snap" back if gently pinched
- Wrinkled skin or folds in the skin (most easily seen on juveniles)

Note - If you come into the room and find their water is empty, it is best to assume they are at least somewhat dehydrated.

Treatment

Fix the water system so that water is now available (make sure the bottle/nozzle does not leak, check for debris plugging the end, make sure it is filled). Offer vegetables or fruit with high moisture content (cucumbers, carrots, tomatoes, etc.) so that all individuals can access water quickly and easily. If there's only one water nozzle and they've been without water for more than a few hours, they may fight or squabble over accessing it. Alternatively, you can temporarily provide a shallow dish of water so all can access.

Young juveniles still nursing may perish despite fixing the issue if the moms were not producing enough milk; when they're not eating on their own, they are fully dependent on the milk and may not drink. By the time mom is producing enough milk again, some may pass.

Breeders

In this section, we will cover breeder-specific information including colony structure, a size chart by age, when to wean, recommended colony sizes for different enclosures, and selective breeding tips as well as few useful bullet-points here:

- ASF can breed as young as 5-6 weeks, although most will not start breeding until 8-16 weeks with 12-16 weeks (3-4 months) being the most common.
- Gestation is 21-26 days.
- If you are seeing clear signs of pregnancy, the babies are likely to be born within a week.
- Average litter size is around 10, but litters can be born up to 20 babies.
- All females will help nurse babies and males will help sitting on babies while moms take a break.
- Unless you have very large colonies (5-6+ females with litters), babies of various ages being piled together should not be an issue. In cases with 5+ litters together, the weakest of the young babies may not get enough food and may perish

Colony Structure



Breeding colonies should have 1 male and at least 2 females. The number of individuals depends on the enclosure size, although most breeders have the best luck doing 1 male with 2 to 4 females.

Some breeders may have colonies with a male and his son and their females - ASF are typically good at establishing a social hierarchy such that males do not fight over the females (the dominant male will do most of the breeding). This is useful if you want to replace the male for a better-tempered son, but not lose production while the son grows up. Once the son is old enough, the father can be culled and the colony will

have a new dominant male by default.

Once a female in the colony has had a litter, that colony is formed and adults should not be removed and then re-added and new adults should also not be added. Doing so will almost always cause brutal fights that typically end in death.

There have been experiments done to determine ways that colonies may be merged or new members added. In many cases, the introductions fail and result in injuries or death, but one of our members (Steven Winters) appears to have hit upon a method that works. We have linked the video [here](#). It is at your own risk if you choose to attempt to introduce new members to a colony, but we know there are situations where you may feel it is worth the risk (i.e. to preserve a genetic trait when the male of an established colony dies without male sons present to continue the line).

ASF Size Chart

This is a general size chart - some lines may grow to larger max sizes or grow faster or slower as juveniles. Not all ASF will reach the max sizes listed as adults; these are the largest sizes typically seen in mature breeders in lines of ASF we have worked with and/or discussed with other breeders.

Age	Female Size	Male Size
Birth	1-4 grams	1-4 grams
1 Week	7 grams	7 grams
1 Month (Weaning Age)	18 grams	18 grams
4 Months	60 grams	75 grams
Full Grown Adult (Max Weights)	130 grams	140 grams

Enclosure Sizing

To some extent, the enclosure size you choose and how many ASF you want in your enclosure is a personal decision. Some lines seem to be happier and produce better in somewhat smaller, crowded spaces, whereas others do best with more space. This is likely an area where you will need to follow trial and error. Below are the general colony sizes most breeders find work well for ASF in various enclosures. (Colony size will be written as [# of males].[# of females])

These ratios were adjusted from the Laboratory Minimum Standards for lab rats and mice accounting for the relative size of ASF rats and their average litter sizes. Unless you're very experienced, we strongly recommend not putting more adults in the enclosure than we suggest

below. More crowded enclosures will also require a more frequent cleaning schedule to prevent respiratory illnesses from the increased ammonia.

- [10 gallon aquarium](#) (20" x 10") - 1.2 colony
- [20 gallon long aquarium](#) (30" x 12") - 1.3 or 1.4 colony
- [Medium Concrete Mixing Tub](#) (DIY Rack, 28" x 20") - 1.4 up to 1.6 colony
- [Large Concrete Mixing Tub](#) (DIY Rack, 21" x 33") - 1.6 - 1.7 colony size
- [Rat Lab Cage](#) (Reptile Basics, 18.25" x 12") - 1.2 up to 1.3 colony
- [XL Rat Lab Cage](#) (Reptile Basics, 21.5" x 15.5") - 1.3 up to 1.4 colony

Anyone who wants to use a different type of enclosure should carefully consider how the floorspace compares to the popular methods above. Bear in mind that the larger the colony you have, the more juveniles you will be housing simultaneously - this is especially true if you need to raise all babies beyond weaning (such as for feeding ball pythons).

For groups with 5 or fewer adults, approximately 0.45-0.55 sq ft of floor space per adult in a breeding colony appears sufficient. (When less space is given, overcrowding seems to occur and cause losses in litters.)

For groups up to 9 or 10 adults, approximately 0.6-0.75 sq ft of space per adult seems sufficient to allow space for the increased numbers of juveniles when litters are consistently being born.

Larger groups are not as well-explored, and with the small space increase seen between 5 and 10 adult breeding groups, we hypothesize that groups larger than 10 adults will need slightly more space per adult to account for the increased number of juveniles present. A good starting point is likely 0.8-0.9 sq ft per adult.

If significant culling is intended to be done at the pinky/fuzzy stage in a given breeding group, a good starting point would be to use the values above for the number of adults whose average litter count you expect to reach hopper/weaning age.

Weaning

ASF have been successfully weaned as young as 3 weeks old, but it is preferable to wait until 4 weeks old. Alternately, you can wean once you've seen all of them eating solids and drinking from the water bottle/nozzle on their own.

It is advised to remove weanling age ASF to make room for the younger litters to be nursed whenever possible.



Weaning at 4 weeks gives them time to learn how to use the water bottle/nozzle and have more time to have a fully solid food diet

If you wean at 3 weeks, include a water bowl in the enclosure until you're sure they are using the water bottle/nozzle - it is also advised to include a few pieces of block or seed mix in the enclosure in case they struggle to reach food on a hopper at their smaller size.

Selective Breeding

As stated previously ASF are **not domesticated**, and for this reason we believe the two important things to remember are:

- Always breed for **temperament**
- Always breed for the **health** of your future lines.

Temperament and the Cons of Socialization

Animal temperament is described as “individual differences in behavior that are biologically passed.” **Temperament** is not the physical traits or characteristics of the animal, but their natural behavior. For this reason it is not recommended to “socialize” young ASF as you risk masking how they would have normally reacted towards human contact.

In general, socializing ASF from birth by handling daily for longer than needed for basic health checks and cleaning will give you a more “tame” animal in situations it was exposed to and became used to when very young; however, this taming and socializing does not and can not cover every instance of interaction that animal may have in the future and does not change the genetic temperament that is passed on to their offspring. By socializing individuals that are being held back as future breeders, you have no way of knowing that you are improving the natural temperament of your lines.

Below are examples of behavior differences between a genetically calm/friendly ASF, a genetically fearful ASF, and a socialized but genetically fearful ASF. The first 2 are situations that socialization from birth would prepare the ASF to experience, but the final shows an unexpected situation that would trigger the ASF to react from its natural temperament.

Event 1: A hand reaches into the cage to lift a hide and check on babies or to add food

- Calm ASF - notices someone has entered the cage, walks over to sniff the hand or just watches to see what's happened
- Socialized + Fearful ASF - notices someone has entered the cage, walks over to sniff the hand or just watches to see what's happened ** This is something that has been taught as "safe" from birth due to socialization
- Fearful ASF - notices someone has entered the cage, freezes in place and is prepared to bite if the hand is too close or lunges to bite the hand

Event 2: The ASF is gently picked up by the base of the tail and moved into a new enclosure during cleaning

- Calm ASF - doesn't attempt to flee and resumes normal behavior once placed in the new enclosure
- Socialized + Fearful ASF - doesn't attempt to flee and resumes normal behavior once placed in the new enclosure ** This is something that has been taught as "safe" from birth due to socialization
- Fearful ASF - attempts to flee from the approaching hand or attempts to bite as it approaches; frequently will bolt for a hide or freeze in place once placed in the new enclosure

Event 3: During cleaning, you trip and knock the enclosure you were about to clean onto the floor; the lid comes off and the ASF scatter into hiding spots since being out in the open is a risky behavior they will all instinctively avoid.

- Calm ASF - once found, can be picked up gently by the tail and returned to the enclosure and resumes normal behaviors shortly after
- Socialized + Fearful ASF - once found, the ASF is in a situation it is unfamiliar with and is fearful - this ASF may react by leaping out of your hands or biting and will likely be skittish and fearful for a short time after being placed back in the enclosure ** This is something that has not been taught as "safe" from birth due to socialization
- Fearful ASF - once found, the ASF is in a situation it is unfamiliar with and is fearful - this ASF may react by leaping out of your hands or biting and will likely be skittish and fearful for a short time after being placed back in the enclosure

An ASF who is naturally calm or friendly and has not been socialized is likely to react more calmly to a surprising situation (i.e. a small child shouting close by, a car backfiring outside, a smoke detector going off in the house, etc.). An ASF that is fearful or aggressive and has not been socialized will react much more strongly to the same stimulus (i.e. leaping and running away, biting, lunging at a perceived threat). The list of things an ASF is socialized to will always be limited in some way and unexpected or scary events can cause them to revert to their genetic temperament reactions rather than the socialized temperament.

Masking behavior through early socialization is considered a risk since a breeder can not be sure the genetic temperament they are passing down in their lines is an improvement or a positive temperament; this is often a way that a historically good line begins developing negative temperament traits by accident. The result is that breeders attempting to socialize will continue to see poor genetic temperaments pop up in their lines.

Selective Breeding Process



Pictured: Two young Cinnamon-Agente with Head-spot variegation on left/middle. Young weaned mouse on the right.

When it comes time to raise up the next generation of breeders when your starting animals are skittish/prone to biting, it is advised to grow up the next colony separately as a replacement if you find a group that has an improved genetic temperament. Once your lines are solid in their genetic temperament, growing out replacement breeders can be done within the colony.

When breeding feeders, it is often necessary to keep poor-temperament colonies going while working on bettering temperament in order to have enough feeders, but you should aim to have at least one colony that is progressively improving in temperament so that the poor colonies can be replaced out of the improved colony's offspring in the future.

In order to breed for a reduction of poor temperament (skittishness, biting, etc.), the following process is recommended:

1. Avoid handling litters beyond the necessary amounts for health checks and cleaning
2. After weaning, wean the entire litter into one "evaluation" enclosure
3. Each week from 4 to 8 or 10 weeks of age, perform a brief temperament test on the evaluation enclosure prior to cleaning (Note: depending on how poor the starting temperament is, some tests may not be useful as every individual will fail) - if every ASF fails any given test, you can choose to move on to another test to determine any better individuals, or wait and repeat 1 week later.
 - a. Open the enclosure and evaluate - any ASF that continues to move (especially calm movements) despite your presence scores points. Any that freeze or display fearful body language can be moved into your feeders-only grow out enclosure.
 - b. Lift all the hides and drop in a small amount of a favorite snack (mealworms, seeds, etc.) - gently replace the lid and watch for which ASF are the most bold and go to eat first. Those who do not eat with you present fail this test.
 - i. If you're concerned about wasting food, use a small amount or leave them to finish the snack for an hour or two.
 - c. Proceed to normal cleaning day routine; any ASF that don't flee an attempt to tail or do not flail around while briefly in the air score points here. If one is very difficult to catch compared to the others or is attempting to climb up its tail to bite, it can be moved directly into the feeders-only grow out group.

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- d. For advanced temperament improvement once litters consistently perform well on the above 3 tests, you can start watching for calm behavior when handled without tailing. Tests for this include tolerance of being placed onto an open hand (without leaping off), level of calmness while held (breathing rate and if they sniff/move around vs freeze in place and just sit there), and tolerance to petting. This level is not often needed for feeder breeding, but is very useful for working toward pet-quality lines of ASF.
 4. Watch for the genders while testing and keep the highest scoring male and the highest scoring group of females; it is counter-productive to end up with a colony that has no females or no males. The number of females you keep depends on what colony size you prefer and how many have a good evaluation. (If you want 1.3 and only 2 females are good but the rest are very poor, it may be worth keeping 1.2 for the temperament improvement colony so you can be sure the 3rd girl's not-so-great temperament isn't accidentally selected from the next generation and leading to setbacks)

Research/Studies

Bedding Performance for Ammonia Control

The following table is copied from a study done to test the ammonia concentrations in lab cages holding mice to determine the ammonia levels of each bedding listed. This is a prime example for why Care Fresh is not a good substrate choice for the health of your ASF. By extension, other paper-based beddings that would not have any additional ammonia control properties are also not recommended.

The full study is available here, unfortunately many beddings used that ranked the highest are not readily available to the public:

[Evaluation of Cage Micro-Environment of Mice Housed on Various Types of Bedding Materials](#)

Table 2. Least squares means ammonia concentrations in static cages housing male NOD/LtJ mice on different types of bedding for 3 weeks

Bedding type	Ammonia concentration (ppm; mean \pm standard error)
Care FRESH Ultra ^a	122.7 \pm 1.5 ^A
Pine shavings	13.2 \pm 1.1 ^B
Cell-Sorb Plus	10.6 \pm 1.2 ^B
Pine shavings plus ALPHA-dri	10.5 \pm 1.2 ^B
Bed-O'cobs	8.6 \pm 1.1 ^B
Beta Chip	3.8 \pm 1.2 ^C
Bed-O'cobs and ALPHA-dri	2.5 \pm 1.2 ^{C,D}
Room	1.9 \pm 1.2 ^{C,D}
Pine shavings control ^b	1.4 \pm 1.3 ^{C,D}
Beta Chip control ^b	1.2 \pm 1.3 ^D
Bed-O'cobs and ALPHA-dri control ^b	1.2 \pm 1.2 ^D

Values not labeled with the same letter are statistically different from one another, based on Tukey HSD test with $\alpha = 0.05$.

^aDiscontinued after 2 weeks.

^bControl boxes contained bedding but no mice.

Rodent Papillomavirus (MnPV1)

“Two rodent papillomaviruses, MnPV1, which infects the Mastomys species of multimammate rats, and MmuPV1, which infects laboratory mice, are currently the most studied rodent PVs. Both of these viruses cause malignancy in the skin and can provide attractive infection models to study the lesser understood cutaneous papillomaviruses that have been frequently associated with HPV-related skin cancers.” (SOURCE: [Rodent Papillomaviruses](#))

