

## Housing & Environmental Requirements

Sugar gliders may be small but they are very active, they need a lot of enrichment and thus require a lot of room. We recommend a minimum enclosure size of 4ft (H) x 2ft (W) x 2ft (D) (not including the stand) for two gliders – but bigger is better. If the cage is too small the gliders will begin to show stereotypical stress behaviours such as backflips or running around the cage bars in circles.

I am often asked how much an initial set up would be for two gliders. This will depend on the enclosure, how many toys you buy, cage furniture, vitamin supplements, food. An adequate cage will cost over £100 unless you are lucky enough to find yourself a decent bargain. Sugar gliders are notoriously adept escape artists so splashing out on a high quality cage is worth it.

If you wish to go down the arboreal vivarium route, you could be looking at £200+, you will then need to adapt it to suit sugar gliders which could be another £100+. I asked a group of sugar glider keepers to estimate their set up costs, and we came to the conclusion that it costs between £300 -£500 before your gliders!

Many people use cages for housing which need to be good quality as gliders are very adept escape artists. There should be no gaps which you could fit two fingers through and the bar spacing should be a maximum of 15mm. Gaps are usually found around the roof, around doors and around the bottom – often there is a grate separating the body of the cage from the waste tray, ensure the grate is flush to the bottom of the cage.

Some cages have a flap for easy removal of the waste tray; if the grate is not flush to the bottom of the cage then gliders will find and use the flap as an escape route.

The cage should be powder coated, but be warned, sugar gliders are messy! A covering may be necessary to stop them from flicking food/waste up your walls, a large piece of fleece or a shower curtain are ideal.

Position the cage so that it is out of the way of draughts and not in direct sunlight. You will need to find somewhere that is quiet in the daytime to allow them to sleep and somewhere that other, un-supervised pets cannot get to.

Despite sugar gliders being nocturnal, they still need a day/night cycle so make sure whatever room they are in will need be light during the daytime (don't keep curtains closed).

I would not recommend keeping sugar gliders in the bedroom; they are nocturnal and active so are likely to disturb your sleep. Not only will they be running around the enclosure and playing in their wheel, they can also be quite vocal. It has been noted on numerous occasions that gliders become more active and vocal around a full moon.

Nor would I recommend you allow your gliders free roam of your bedroom while you sleep. Gliders need supervision, they will climb the walls, the curtains, get in to very small spaces, hide practically anywhere, eat anything and get in to as much trouble as they possibly can! It is not safe!

You could even end up crushing/suffocating them if they were to get in to bed with you. You need to know where your gliders are, they need a watchful eye keeping over them. As lovely as it sounds to allow them the space while they are at their most active, their safety must come first.

Sugar gliders come from temperate forests and so they need to be kept warm. If the temperature drops too cold they are at risk of dropping in to torpor which can be fatal if not caught and reversed. If the temperature is too hot they will overheat. The ambient temperature needs to be around 25-30 degrees Celsius.

Humidity also needs to be taken in to consideration, central heating causes the atmosphere to be very dry which is no good for gliders. They have very delicate skin which will dry out if there is no humidity. The outer edges of their ears will dry out and crumble away, if you notice this starting to happen you need to increase the humidity a little. Some people lightly mist with warm water above the cage, you don't want to get them wet.

There seems to be a growing trend of keeping gliders in custom made vivariums, I personally prefer vivariums as I feel they are more secure. Both enclosure types have pros and cons: with a vivarium, ventilation can be a problem, you will need to make sure there are secure air vents at the top and bottom of the viv to allow air flow. In a cage ventilation is not a problem, but draughts can be – draughts are very dangerous to gliders as they can cause chills.

Vivs are relatively escape proof – unless you leave the door open, or the air vents are not secured properly, they cannot get out! With a cage however, bars bend, there are often large gaps, waste tray flaps, the bar spacing is too wide, there are a lot of opportunities for escape! Also, in vivariums gliders are safe from other pets you may have.

Cages are great for hanging 'cage furniture', especially if the roof is also bars and not just an apex roof. Vivs however are not so great for hanging things! The way we get around this issue is by covering the sides with untreated willow trellis which allows gliders to climb the walls, and we tend to have a more natural looking set up with branches and logs and of course, a wheel.

There are many more pros and cons for using cages and vivs but to me, the viv wins! Safety is paramount.

### **Cage furniture**

Gliders need somewhere warm and cosy to sleep, in the wild they would live in a hollow tree trunk which they line with feathers, eucalyptus leaves and other miscellaneous items to insulate the nest.

In captivity we tend to use cage pouches, care should be taken with pouches as many gliders chew them and due to their long claws they can become caught and trapped. Check cage pouches daily and discard immediately if there are loose thread, are worn or damaged. The pouch should be made of fleece (other materials can cause gliders to become trapped), have very small stitching and hidden seams if possible. Pouches are available to buy in the UK, but please make sure you buy from a reputable seller or glider savvy seamstress.

Some people prefer to use wooden nest boxes, although these seem more natural, they are pretty bleak especially without any bedding materials. Gliders will also sit on top of the nest box and urinate on it, wood soaks up the urine so they become pretty smelly! If you decide to use a nest box, make sure you provide plenty of nesting material so that they can line, insulate, and make it more comfortable for them.

Always have more than one sleeping area available as wild gliders will utilise more than one nest. Likewise, always provide more than one feeding station. Sometimes gliders become aggressive over food, you do not want one of your gliders not being able to eat. Try and place the feeding stations a good distance apart and if possible, out of view from the other feeding station.

Wheels are an important feature in sugar glider cages, not only do they provide the glider with something to do, they are important for exercise which helps with the absorption of calcium. Wild gliders cover many miles in a night moving between one feeding site and another, they do not need to do this in captivity but they still need the exercise and they enjoy it.

The wheel should be one made specifically for sugar gliders like the Stealth Wheel. Many people use a Wodent Wheel with a tail guard to help prevent any injuries which is a cheaper option. Some people have had gliders injured by Wodent Wheels, I am not sure whether the tail guard was fitted or not though. Both the Stealth Wheel and the Wodent Wheel are available with special tracks to help keep the claws blunt.

Everything is a risk with gliders, you cannot wrap them up in cotton wool (although some really should be!). All you can do is make an informed decision, avoid unnecessary risks and REGULARLY check everything in the gliders' environment for damage.

Wire wheels should not be used for sugar gliders (or any animal for that matter), as they have caused many injuries and deaths. If you buy a cage with a wire wheel already inside, remove it before you put the gliders in, they really are not worth the risk – not even for one night!

Live branches are a great addition to cages, care should be taken to ensure the branches are not toxic and that the tree has not been treated with chemicals. Gliders enjoy stripping the bark and removing leaves which are often used to line the nest. Live branches are great for enrichment and the bark stripping should help with their oral hygiene.

You could make holes in the branches which you could fill with a wax worm or you could mix some acacia gum up and fill the holes with that.

Some popular branches are apple, pear, willow, manzanita and Java (there are many others and an extensive list of safe woods and plants is attached at the end of the care guide). Eucalyptus and Acacia are also safe for gliders but not as easily accessible unless you grow your own.

According to Dr. Stephen Jackson, Melbourne Zoo. All species of Acacia (for the sap), Banksia, Callistemon, Corymbia, Eucalyptus, Melaleuca (for nectar or pollen) are suitable for Sugar Gliders.

Enrichment is very important to prevent boredom and it encourages natural behaviours, there are many ways to enrich their lives and many things you can do. As well as what has been previously mentioned, there are also forage toys with hidden treats for them to find. You could just even rearrange their cage and add new things to their environment – they love exploring and finding new things. Put some shredded paper or other bedding on the floor of their enclosure so they can take that to their nests. You just need a bit of imagination.

If you house your sugar gliders in a vivarium, throw in some live locust so that your gliders can hunt for them. It is interesting to watch them hunt.

### **Substrate**

Substrate refers to what we put on the floor of the enclosure and is down to personal choice. Some people just use sheets of fleece so that they can remove it and throw it in the washing machine – fleece would be more suitable for cage waste trays rather than vivariums. Kitchen towel can be used, which again is better for the waste trays. There are many types of absorbent, odour destroying substrates that can be used but make sure it is natural and not scented. Others use reptile bedding like aspen or even dust free shavings.

Whatever you decide to use, make sure it is not dusty or a choke hazard. Gliders will fish about in the substrate if they can reach it and if they drop something they want in it!

### **Cleanliness**

I mentioned before that gliders are messy, the mess is easily contained if they are housed in a vivarium. If they are in a cage however, a cover may be necessary to prevent damage to your walls and carpet. Sugar gliders often sit in their food bowl so their feet and hands become covered in food which they then flick off or tread all over the bars of the cage. Poop also often ends up on the outside.

Use an animal friendly disinfectant to clean your enclosure, I use F10 SCXD, the XD has an added cleaner but is still safe for animals. The cage bars become sticky from the food as well as urine so these need to be regularly wiped down.

It is up to you how regularly you spot clean/deep clean your enclosures but glider waste does have a strong aroma. Gliders (especially un-neutered males) scent mark their surroundings, so if you deep clean too often the gliders will be constantly scenting their environment which also has a strong aroma.

To avoid 'super scenting', clean the enclosure in stages. The waste tray can be cleaned as often as you like because the gliders cannot get to that part of the cage. But sugar gliders rely heavily on scent, so if everything is cleaned at once they will want to freshly mark everything again.

By cleaning in stages, the male will not feel the need to go around and re-scent everything. Items within the enclosure will still have his scent so his whole territory does not need to be reclaimed.

### **Sugar Gliders Need Company**

This topic is so important I felt that it needed a title and a page all of its own and not just a brief paragraph hidden somewhere within the depths of the care guide! I cannot stress strongly enough how much sugar gliders need company of their own kind for their physical and mental well-being.

Wild gliders live in large colonies and being alone would mean death to them. Our captive gliders are not under threat from predators (although some pet gliders have met their demise because of the family cat/dog) but that does not mean they do not have this instinct.

Captive gliders are not domesticated and they cannot be compared to domesticated animals like dogs. Dogs have been domesticated over thousands of years (estimated at 18 – 32 thousand years) and have learnt to accept humans as part of their pack. Despite these thousands of years however, dogs still need a hierarchy, they still feel the need to protect the pack, and they will still hunt and squabble over food so they are still showing some of their wild instincts.

By complete contrast, sugar gliders have only been kept in captivity for around 200 years. According to Stephen Jackson in the book *Australian Mammals Biology and Captive Management*, *“Possums and gliders have long been held in captivity with records suggesting that considerable numbers of sugar gliders were held as pets as early as 1830 – 1840s (Gunn 1851)”*.

They did not seek out humans to make their life easier (like dogs allegedly did), we sought them out to make our lives more pleasurable.

Some unethical breeders are happy to sell gliders to be on their own, they tell people that so long as you can spend 2 hours a night with them, they will be fine. This is not the case, 2 hours with company means 22 hours alone. Sugar gliders are nocturnal so will be most active while you are (or should be) sleeping.

They will also tell you that it is easier to bond with one glider, rather than two. Again, this is not the case, gliders give each other confidence. A glider without confidence will be crabby and nervous, even in pairs they can still be nervous but usually one is more curious than the other and the shy glider will soon follow suit.

Sugar gliders have been used as test subjects in laboratory experiments investigating serotonin deficiency depression. The following is a quote from 'Practical Marsupial Medicine' by Cathy A. Johnson-Delaney, DVM, Dipl ABVP (Avian):

*“Self-mutilation is usually seen in solitary sugar gliders. Sugar gliders have been used in laboratory animal medicine as models of serotonin-deficiency depression. To clinically depress a sugar glider, the researchers found one only has to house them as single animals.”*

Depression is known to repress the immune system which would make single gliders more susceptible to illness. Self-mutilation which is a common problem with solo gliders will start with over grooming, they will then start to pull their fur out and this can then lead to them biting themselves. Veterinary intervention is required as they can seriously damage themselves.

Depression, immune suppression and self-mutilation are not the only dangers of keeping a solo glider. Gliders need to be kept warm, if their body temperature drops too low they will fall in to torpor.

Wild colonies will become torpid when the weather is too bad for them to go out and search for food. The difference is however, that wild colonies are large so they snuggle together to make sure their individual body temperatures do not drop too low.

If our captive gliders drop in to torpor, due to the lack of a colony, they struggle to maintain their body heat. As a result their energy stores are burnt up by the body trying to maintain a safe body temperature as well as keeping all the internal organs functioning. Once the energy reserves are used up, the body cannot continue to function and, if not caught in time, they will then die!

If you are not prepared to provide this most basic of requirements, then I would strongly urge you to dismiss the idea of sugar gliders as a pet. Quite simply put, it is cruel to keep a glider on its own!

### **Buying your First Sugar Gliders**

Generally speaking, do not buy your gliders from a pet shop! It is very common to find that those who have bought from a pet shop have un-socialised, aggressive gliders. Shops tend to lack knowledge of glider care and requirements and they are often fed a woefully inadequate diet which can lead to health problems later on. Pet shop gliders tend not to be handled, they are poorly housed and they often sell males as females and vice versa.

I should say here that not all pet shops are the same, I used to own a pet shop (although I never sold or kept gliders as part of the business)!

As a sugar glider keeper myself, I do not feel that shops are a healthy environment for them. All the activity is during the daytime when gliders should be sleeping. The shop closes at night so the gliders will not get any out of cage time or human interactive playtime.

However, if a shop is your only option as you cannot find a breeder anywhere near to you, make sure you ask lots and lots of questions. Read this care guide thoroughly so you can quiz them on diet, housing, and basic requirements. Ask if you can see the gliders being handled, if they reach for a set of gardening gloves, or hold the glider so tightly it can't move, don't buy from them!

It is worth taking the time to find a good breeder, but be warned, there are bad breeders too! You still need to ask lots of questions. As a breeder myself, I regularly update people waiting for my joeys with pictures and videos of me handling them. Most people have a smart phone so pictures and/or videos should not be too much of a problem.

You will need to find out from the breeder what they are feeding their gliders as a sudden change in diet can cause upset tummies so if you do not like the breeder's diet you will need to slowly wean them on to the diet of your preference.

A good breeder can easily show they have extensive knowledge and that their breeding gliders are actually pets and not just money makers. They should have enthusiasm and, all the good breeders I know, will talk for hours about their experiences both good and bad.

### **Colony dynamics.**

For all intents and purposes, a neutered male can be classed as a female. Neutering removes the testes where most of the testosterone is produced. Neutering is best done before the male reaches sexual maturity (4-6 months out of pouch). If neutering is done after this time and he has already developed his bald spot (scent gland), you will need to wait for at least a month until his hormones settle and his scent gland is no longer active before you introduce him to another male.

For the purposes of the 'Colony Dynamics' section of this care guide, assume that the term 'neutered male' refers to a male that has been neutered long enough for his hormones to settle and he is not perceived as a threat to an un-neutered male.

Wild gliders live in large colonies of one male and the rest female. If you plan to keep a breeding group, then you will need to observe the one male rule. However, breeding groups do not seem to work too well in captivity so most breeders keep breeding pairs.

Neutered males mix well with males and females alike, they also make a great addition to a breeding pair. So male, female and neutered male works well together.

Females work well with other females and of course males (neutered or not).

Un-neutered males do not mix well with other un-neutered males, especially if there is a female around. However, neutered and un-neutered males can work together. The un-neutered male will not be perceived as a threat as he is not producing testosterone in large enough amounts.

### **Neutering**

If you do not wish to breed your male/female pair then you will need to get the male neutered, they will breed regardless of whether they are related or not. Females cannot be neutered, the operation on such a small animal is too complicated and she may not survive. With males however, the operation is short and they can be up and active again within half an hour of being anaesthetised.

Neutered males can make very loving, gentle pets as they are not driven by their hormones. Many people have found that neutered males actually make better pets than un-neutered males or females.

They do not tend to display territorial behaviours, especially if neutered young but they still have the adventurous curiosity of un-neutered males.

Un-neutered males scent mark a lot. Male sugar gliders have the main scent glands on their head and chest but they also have anal scent glands. The scent is not overly offensive (in my opinion) but it can be strong. Neutering does not stop them from scent marking behaviour but it greatly reduces the odour.

The head and chest scent glands ooze a yellowish oil which stains the fur of the male and also other colony members – by ‘de-activating’ the scent gland you will have cleaner looking gliders.

As I have mentioned previously, neutered males are a lot easier to house than un-neutered males and they make a great addition to a breeding pair.

It is not uncommon for neutered males to mount females, especially if they were not neutered before they reached sexual maturity. So do not be surprised if you witness mating behaviour, but obviously, as he is neutered he will not be able to impregnate the female.

Physical benefits have not really been documented as yet, we can only assume they are the same as for other animals.

If you make the decision to neuter then you will need to find a vet that is either experienced or willing to learn, most exotic specialist vets will be able to perform the procedure.

When the glider wakes up from the anaesthetic, his first instinct will be to chew so he needs to be distracted by food. My vet also administers long acting pain relief to prevent attention being drawn to the neuter site. Sugar gliders are well known for attacking their wound and removing the stitches so internal stitches are necessary.

If your glider re-opens the wound site then you will need to take him back to the vet for re-stitching. If he re-opens the wound again, a collar will need to be put on him to prevent further attacks on the site. The collars are not easy to put on so you may need some help!

Some vets advise splitting the male from his colony for a while after neutering. I can understand why they would suggest this but it isn't necessary or recommended. The male is going to be stressed after his operation which will be compounded by separating him from his family and the change in his environment. Just put him back in to his enclosure and carry on with your normal routine. You will need to check the op site but don't make a big deal out of it.

### **Introducing Gliders**

If you decide to purchase your gliders from two different breeders, you will need to introduce them properly to reduce stress and the risk of fighting.

It is important to quarantine any new animals before introducing them. It is unlikely that they will be carrying anything nasty, especially if you have carefully selected the breeder, but you just never know.

As gliders do not cope well being kept alone I wouldn't recommend anything more than quarantining for two weeks. You could also take them to the vets for faecal samples to check there are no internal parasites, although this could also be considered an unnecessary stress, especially if the gliders are not bonded.

There are a few basic guidelines that should be followed:

- The colony dynamics which I covered earlier in the care guide.
- Do not introduce an un-neutered adult male to a young female – females should be at least 1 year out of pouch before being put with a male of breeding age.
- Make sure both gliders are around the same size.
- Do not just put them in the same cage and let them get on with it.

Place both cages side by side, about a foot apart so that they can see, hear and smell one another, but they cannot reach one another.

Sugar gliders recognise other members of the colony by scent so you need to transfer scent from one glider to another. For introduction purposes, allow both gliders to make their cage pouches really smelly by leaving them unwashed for at least a couple of weeks. Once the pouches are suitably smelly, swap them over. Swap pouches for around a week and watch your gliders to see how they react to one another across the cages.

After a week of pouch swapping, try some supervised playtime during the early evening – I recommend using a small tent so that they are enclosed and safe and you can also

intervene quickly if needed. You want them to interact with one another, have plenty of treats and toys at the ready to encourage play.

After a week of supervised playtime and you are happy with the gliders' reaction to one another, you can try putting them in a cage together. It is best to put them in a fresh cage with clean toys and nest boxes/pouches, however, this is not always possible as it will mean you need 3 cages.

If a clean cage is possible, great! If not, clean one of the cages as well as you can and put in new pouches and toys, then **during the day time** put the gliders in the clean cage. Evict them both from their respective nest boxes/pouches and allow them to see one another and explore their new surroundings. They will both be sleepy so they should both find the nest and go back to sleep.

You must keep an eye on them until they find the nest; and when they wake up. Make sure you give them two feeding stations to avoid squabbles over food. You should be ready and prepared to intervene if fighting breaks out. But, if you have followed the introduction process and read the gliders signals properly, there should be no real aggression.

Gliders do squabble occasionally, so a few cross words or scuffles are normal. If the scuffles become aggressive you will need to split them back up in to separate cages and think about what went wrong.

### **Bonding with your Gliders**

Before you bring your gliders home, cut up a few pieces of fleece and wear them about your person for a couple of days. Do not wash them, just put them in to the nest; gliders rely heavily on scent so having your scent in the nest will help them become familiar with you while they are in their safe place.

Once you have got your gliders home and in their new enclosure just leave them alone for a couple of days. They need time to readjust and become familiar with their new surroundings, sounds and smells. Feed and water them but just ignore them otherwise. Keep any activity around their cage calm and minimal.

Sugar gliders can form very strong bonds with their keeper but in order to do this you need to be classed as part of the colony. For bonding purposes I recommend old clothes that you do not mind being scented and urinated on. It sounds grim, but you need to keep these clothes smelling of your gliders while you are forming the bond, so don't wash them!

Young joeys are not necessarily easier to bond with, adults can form strong bonds too. It all depends on how much the gliders have been socialised from an early age and, if they're adult, how they have been treated by previous owners and if they have been passed from home to home.

If adults have been treated well and have already bonded to a human they have already learnt to trust humans, and are likely to form a bond easily with a new keeper. Nearly all sugar gliders will bond, some take longer and need a lot of time and patience.

Things to remember while bonding:

- Sugar gliders are prey animals – we are predators! Try and not act like a predator.
- Be calm and relaxed and talk softly.
- Wear clothes that you do not mind being glider scented
- Be patient – bonding must be on their terms and at their pace, learn to read their signals so you know when to back off.
- Never punish, swipe, flick or shout at your gliders. Negative behaviour like this can damage trust and undo all of the hard work you have put in.
- Not all gliders like to be physically held.
- Try bonding in the daytime when they are lethargic
- Have lots of treats available, be generous – the way to a glider’s heart is through its stomach!
- Never chase a glider – this is predatory behaviour

Bonding pouches are available that allow you to carry your sugar gliders with you during the daytime but make sure the pouch has a zipper so your gliders cannot run off. Bonding pouches are a great way for your gliders to become accustomed to your scent while they sleep. The aim is for them to associate your scent with warm, relaxed comfort.

The tone of voice is important, not the words, but I find that I talk less softly if I’m talking to them about work! I think that if you are telling them how sweet and adorable they are and that you’re not going to hurt them, your tone will automatically reflect this.

Only keep them with you in their bonding pouch for a couple of hours to start with. It may help you to actually replace their nest with the bonding pouch so that you can just zip it up and go rather than disturbing them or struggling to catch them and risk upsetting them. Do not do chores like vacuuming while they are with you.

While you have your gliders in the bonding pouch and when you are in a safe environment (i.e. not outside), open the zip and offer them a treat (with your fingers, not tweezers), I suggest sitting down for this. They may crab at you but hold your nerve, just keep offering the treat and talk to them calmly.

If the glider lunges at you, you need to hold your nerve! Use a large treat so that when the glider lunges he will bite at the treat rather than you. Continue to talk softly and do not make sudden, jerky movements, be calm. Expect crabbing and lunging, you will be more prepared for it and less likely to jump and startle the glider.

Be confident when offering treats, do not wave your hand around as this will encourage the glider to grab your finger. Sometimes the glider will hold your finger, take the treat and release you but sometimes they hold on, this is not what you want as it is very hard to get them to release, the more you try the more they grip on.

To prevent the finger holding, offer the treat with one hand and place your forearm of the other arm in front of your treat hand. This way you are offering the glider a step, they step on to your left arm (for example) and take the treat from your right hand.

If your glider physically turns away from the treat you are offering and starts to burrow in to his pouch, he is telling you he’s had enough. Leave the treat in the pouch for him (one per glider) and put the pouch back in his enclosure. I recommend leaving the treat as your gliders may not be familiar with that particular taste so let them discover it for themselves.

Once both gliders are happily accepting a treat from you without crabbing, you can slowly start to pet them on the side of their face (their cheeks) while they are eating. I tend to offer them something slightly larger and chewier than a yogurt drop to do this; it just allows you more time to organise yourself and to pet them. From this you can progress to head strokes and full body strokes.

Night time activities with your gliders are also important. I highly recommend buying a small indoor tent so that you can embark on some safe play time with them. Remove them from their enclosure in their pouch and sit in the tent with them, make sure you have lots of treats with you. Lure the gliders out of their pouch with treats, and encourage them to play.

You can use cat toys (but no catnip!), or craft feathers (not from wild birds picked up from the street) as gliders like to hunt and pounce and chase things. To keep their interest, make sure you offer them a treat once they catch the toy/feather.

When you first start with 'tent time', it is doubtful that they will play much at all but you need to keep trying and encouraging them. Gliders appreciate the opportunity to get out of the cage and, once bonded, enjoy the interactive playtime. You will soon become a treat dispenser, launch pad and landing bay to your gliders which is exactly what you want!

Some people suggest playtime in the bathroom, I personally do not like this idea. In a tent gliders can climb the walls, in a bathroom most surfaces are slippery and unclimbable. A glider's natural instinct is to climb and to not allow them to escape off the floor (or bath) is stressful for them. Not to mention all of the hazards like the chemicals we use on surfaces, open toilet lids, and it's unhygienic! Would you let your child play in the bathroom? A tent is a far safer, more comfortable environment for both yourself and your gliders.

I often receive emails from people who cannot offer their gliders interactive playtime as their gliders do not 'get up' until the early hours of the morning. There are ways to encourage gliders to rise earlier, you need to get them in to a regular routine, feed them at 6 or 7pm. When you feed them peek in to their nest and offer them a treat. They will soon learn to expect the treat and be up waiting for you.

Some gliders are particularly sensitive to light and will not rise until the lights are turned off. If it is still light outside, close the curtains and turn the lights off, or if you have dimming lights, dim them. You will also benefit from red light bulbs. Red light appears to be invisible to nocturnal animals; the neighbours may question you, but at least the gliders will appreciate them.

Sometimes you will need to pick your glider up whether it is to transfer from one pouch to another or if they escape and run off.

If the glider is loose in the room you need to make sure there is nowhere they can escape – windows and doors should be closed anyway if you allow your glider out to play in the room; but if they have escaped their cage, escape routes need to be a priority. Stay calm, remember the predator/prey scenario, you do not want to appear to be a big clumsy predator that wants to eat the glider!

If the glider is bonded it should be easy, the glider should jump on you when you are close enough (especially if there is a treat involved). If not, hold your hand towards them and they should run towards and on to you.

If the glider is un-bonded, I recommend that you arm yourself with treats and you grab the cage pouch. Gently and calmly coax the glider towards you with the treat and show them the cage pouch. If you are lucky, the escapee will climb in to the pouch. If you are not so lucky you need to catch the escapee. Wear the pouch like a mitten with the inside of the pouch on the outside. Distract the glider with a big treat, while he is eating slowly and calmly show the glider your pouch glove. Then gently put your hands around the shoulders/mid-section of the glider and with your other hand turn the pouch inside out keeping the top closed. Put the pouch back in to the enclosure and leave him alone. If the glider escaped, it is a good idea to scrutinise the cage to find out how he escaped.

Picking a glider up out of the nest pouch is sometimes necessary but it is also a good bonding technique assuming you do not have a crabby, lunging, defensive glider. Do not attempt this until your gliders are taking treats from you without crabbing.

When picking a glider up out of the nest pouch, again, have treats at the ready for a distraction. Take the pouch out of the enclosure and sit down with it. Offer the glider a treat and calmly and slowly insert your hand in to the pouch behind the glider. Take your time and don't be afraid to stop (with your hand still in the pouch) to allow your glider to become accustomed to what you are doing. The aim is to mimic what other gliders do when entering the nest, they tend to burrow down in to the colony. Gently work your fingers underneath the glider so you are cupping him in the palm of your hand. Expect a few nips and nibbles, but if you remain calm they shouldn't be the sort of bite that draws blood. Keep offering treats so that the glider enjoys being in your hands and slowly start petting him.

Once the glider is comfortable with your hand, you can then progress to luring them on to your arm or shoulder.

The more effort you put in to bonding, the more rewards you will get in return. Once they are fully bonded they will want to be with you, and they will seek out your company. Sugar gliders will bond with all members of your family but I would not recommend you allow your children bonding time unsupervised. Gliders have very sharp claws which allows them to climb skin! Children are also noisy and excitable which is the exact opposite to what gliders need!

Speaking of claws, when a sugar glider walks over your skin, do not be surprised if you develop an itchy 'rash'. This is very common and is easily reduced by an astringent gel, and as your body gets used to the gliders you will stop reacting in this way. I only react to new gliders, I have no problem with my current ones.

How long the bonding process takes is different for each glider, it is impossible to guess how long it will take. You just need to be patient and persistent and have an endless supply of treats. You need to persuade them to trust you, let their curiosity bring them to you, not the other way round.

### **Treats**

If you have read the bonding section, you will have noticed that treats are an essential item for every sugar glider keeper. Yogurt drops (ones that are specifically for sugar gliders) are a universal favourite. Dried fruits, meal worms, wax worms and morio worms can also be used.

Avoid using human food (including baby foods), they tend to be full of hidden sugars like sucrose, fructose, inverted sugar syrup and honey. They are full of preservatives, colourings and flavourings.

Human food is full of fat; sugar gliders need very little fat in their diet. Feeding too much can lead to liver ailments and also eye problems. It is known that if a female glider is fed a high fat it can lead to blindness in the joeys – I rescued a glider with this very issue, he was named Seymour ...

Baby foods are often fortified with vitamins and iron, if you are feeding a good diet, you already feed your gliders plenty of vitamins, and excessive amounts can be detrimental. Too much iron is also dangerous as they have difficulty removing the excess iron from their system and they can develop Hemochromatosis or Iron Storage Disease; I will go in to this condition further in the Health Section of this guide.

### **Anatomy, Health and Wellbeing**

A healthy sugar glider should have a nice, smooth coat and a bushy tail. The coat colour varies from a beautiful steel grey to a reddish brown. However, grey gliders can stain due to poor diet, poor husbandry or from male scenting. The darker markings on a red/brown glider will be brown rather than black.

The tail is semi prehensile which means the sugar glider can use the tail for grasping, but it cannot support its own weight. It should be well furred; a bald tail would indicate poor nutrition, injury or stress. Quite often the tail will lose just a patch of fur which could be down to a slight disagreement within the group/pairing as gliders will bite another glider's tail during an argument. One should never pick up or hold a glider by the tail, doing so can very easily cause a break or dislocation.

The ears should be perky, alert, smooth and shiny, they should not look dry and there should be no crumbling which would indicate a lack of humidity in the environment.

The eyes should be bright and clear with no discharge and the third eyelid (which comes across the eye) should not be visible. Bright eyed and bushy tailed really does apply to sugar gliders.

Sugar gliders do not need worming or inoculations, and fleas are not an issue either. Fleas can and will jump on to a glider, but they will either be groomed off or they will not be able to attach due to the fur density.

The teeth are very odd looking, the top teeth are pointy and visible when the mouth is closed so they appear goofy. The bottom teeth are incredibly long and protrude from the jaw forwards with a slight curve inwards.

The teeth are not like a rodent's teeth, they do not grow constantly and they do not need trimming. Trimming the teeth would cause a lot of pain and the glider will be reluctant to eat. Many of us know ourselves what it is like to break a tooth!

Claws are long, curved and sharp as they are used for running up and down tree trunks. In captivity our gliders' claws will probably need blunting or trimming. Nail trimming tracks are available which fit in to glider wheels. Sometimes tracks are not enough, however, so trimming will be necessary, only the very tip of the claw should be taken off. There is a vein that runs down the claw which you do not want to nick, but also cutting

too short will affect their ability to climb. You will often notice a glider hanging off cage bars, for example, just by their claws.

Glider hands (front paws) are similar to our hands in that they can hold and grip things with it and they have an opposable thumb. All of the fingers and the thumb should have a claw.

The back feet are unusual in appearance, they have a 'thumb' which does not have a claw. The next two toes are fused together, they both have claws and are used as a grooming comb. The last two toes are just normal toes with a claw on each.

**\*\* Interesting fact\*\***

The back feet can rotate through 90° so they are facing backwards, this allows sugar gliders to descend tree trunks quickly and easily.

### **Male or Female?**

It is relatively easy to tell the difference between an un-neutered male and a female. The males have testicles on the belly area, they are two small round furry balls often fondly referred to as 'poms' by glider keepers.

Males (once matured) also have two obvious scent glands, one on the top of the head and one on the chest (they do have others but these are the most prominent). The scent glands secrete an orange/brown oil which is used to mark territory, other gliders and human friends.

Females have a pouch which is not always obvious, especially in young females that have never bred.

It is possible to tell the sex of a glider as soon as it comes out of pouch as the belly is not furred. Males have a little bubble on the belly and females have a slit.

Neutered males generally do not have the scent glands as they are activated by the hormone testosterone. Most of the testosterone is produced in the testes so by removing the main producer, you will prevent the scent gland from being active. Some males that are neutered later on in life will retain some of their gland.

### **Diet**

Diet is one of the most controversial topics within the glider world. The following is based on my experiences as a glider keeper for over a decade; a lot of research, some professional input from vets and a dash of common sense.

I have not come across a captive diet that resembles the wild diet, but I do incorporate some of the items (or a variation of) that a wild glider would consume. The same basic principles apply for gliders as they would humans; low fat, low sugar and plenty of variety.

The diet of a wild glider mainly consists of the sap from Acacia trees, pollen, nectar and insects. The majority of the protein comes from pollen with the exception of breeding season when gliders opt for insects.

The captive diet is made up of fruits and vegetables, a protein source, supplements and 'diet enhancers'.

The first diet listed below is a maintenance diet for none breeding gliders:

### **SGS I**

This diet consists of a staple fruit and vegetable mix, I use 2 thirds vegetable and 1 third fruit. The veg I tend to use mostly are:

- Butternut Squash
- Sweet Potato
- Carrot
- Sugar Snap Peas
- Spring Greens – twice a month

The fruit I use are:

- Apple
- Pear
- Melon
- Sharon Fruit (Persimmon)
- Mango
- Papaya
- Orange – once a week

The above lists are by no means complete, variety is important for a healthy diet. You just need to make sure that the fruit and vegetables have a calcium:phosphorus ratio of around 1:1 - 2:1. The easy way to do this is by using the calcium:phosphorus traffic light system which is listed at the back of this care guide and on [www.sugarglider.co.uk](http://www.sugarglider.co.uk)

### **Foods to avoid**

- Grapes – these are toxic, they appear in the Merck Veterinary Manual as the cause of death in some dogs. A close friend of mine lost two skunks which was confirmed by a vet as a direct result of consuming grapes. Some people disagree, but to me, it's just not worth the risk.
- Onion family – causes a type of anaemia – therefore toxic
- Rhubarb – toxic
- Avocado – the flesh is far too fatty and appears in the vet manuals as having toxic properties.
- Honey – pure sugar, use only for occasional treats or if glider drops in to torpor to raise blood sugar levels. Honey is the cause of massive debate – I will put forward my case later on.
- Nuts & Seeds – these serve no nutritional purpose to gliders
- Parrot and hamster food – these serve no nutritional purpose to gliders

Many people with 2 or 3 gliders do a large batch of around 30 meals. 1lb of fruit/veg makes 25-30 meals depending on how generous you are with the tablespoon. If you wish to do this, once the mixture is at the consistency you want, spoon it in to ice cube trays (each one is about a tablespoon) and freeze. Thaw out a cube per glider for the evening meal.

Always wash your fruit and veg; peel the butternut squash and sweet potato, etc. If we peel the item to eat then peel it for the gliders. I don't bother peeling things like apples, pears, carrots, Sharon fruit, peaches, nectarines, etc.

Chop the fruit and veg up and pop it in the food processor, add water and blend it to a mush, add as much water as you need to keep the mix moving easily.

The reason we blend the food is because each fruit/veg has different vitamins and minerals and gliders tend to pick out their favourite food items. So by blending the diet, it ensures they receive the benefit of all vitamins and minerals. I tend to blend it so it is quite smooth but lumpy.

The directions below are for a 1 pound (450g) mixture of fruit and vegetables.

While the fruit and veg is being blended add:

- A vitamin supplement, either Wombaroo High Protein Supplement (2 teaspoons per pound of fruit/veg) or Glider Booster (half a teaspoon per 1lb of fruit/veg mix).
- Calcium powder – half a teaspoon per 1lb of fruit/veg mix. I use a liquid calcium which is mixed in to individual food bowls at the time of feeding at a rate of 0.1ml per 100g bodyweight.
- Natural Probiotic yogurt, 1 tablespoon per 1lb of fruit/veg mix
- If using boiled eggs as a protein source, remove the shell and add them too (use 1 per 1lb of fruit/veg mix).
- A quarter of a teaspoon of acacia gum per 1lb of fruit/veg mix
- 1 teaspoon of bee pollen per 1lb of fruit/veg mix (Either added to the mix for a daily dose or if you wish to give less often add a pinch to the defrosted evening meal instead)

#### **A Note about Protein Sources**

Protein is another hotly debated topic in the glider world. There are a number of different protein sources you can use but the vast majority of them have very poor ca:p ratios.

Insects – I do not recommend you use these as the main protein source because, when shop bought, they are very poor nutritionally. If you wish to use insects I would recommend breeding them yourself and feeding them the kind of diet you feed your gliders to ensure they are healthily gut loaded. However, as many people that breed their own insects have found – they need as much care as the animal they are being bred for!

Egg, chicken, turkey are good protein sources but all have poor ca:p ratios. When feeding chicken and turkey, it should be cooked without any seasoning.

Some people use a high quality cat biscuit provide both the protein and the crunch. *Ellen S. Dierenfeld, PhD, CNS* in the diet research paper *Feeding Behaviour and Nutrition of the Sugar Glider* advises “*use of a properly balanced dry commercial product that also includes vitamins and minerals essential for other omnivorous species (i.e., dogs or primates) is superior to protein sources comprised of supplemented animal products, such as meat, eggs, and insects*”.

Although cats are not omnivorous, the kibble is similar in nutritional value to dog food, and the kibble tends to be a more manageable size for gliders. Cat biscuits have a good ca:p ratio, contain a range of vitamins and minerals and also provide a crunch in the diet. Gliders need a crunch in order to help keep their teeth and gums healthy.

Unfortunately, many people overlook this and do not realise the importance of oral health in gliders.

Cat biscuits do not cause 'lumpy jaw' or abscesses. Cavities are caused by poor oral health and too much sugar in the diet. Some gliders have a pre-disposition to abscesses (genetic), or they can be caused by injuries and again, poor oral hygiene. If you decide to use cat biscuits, give each glider 5 or 6 pieces of the kibble.

The next diet works on the same principle as SGS I, the staple is a fruit and vegetable mix as above. However, with the SGS II diet we add extra ingredients to ensure the female is in prime condition for breeding.

## **SGS II**

The fruit and vegetable mixture is the same as SGS I except we add linseed, Oatmeal or Wheatgerm and we use a High Protein Supplement rather than Glider Booster.

### **Instructions Per Pound (450g) of Fruit/Veg Mixture**

Soak 1 tablespoon of linseed in 3 – 4 Tablespoons of boiled water, the boiled water softens the linseed shell and releases the oil.

While the fruit and veg is being blended add:

- Wombaroo High Protein Supplement – 2 teaspoons per 1lb
- Calcium powder as per instruction on the pack. I use a liquid calcium which is mixed in to individual food bowls at the time of feeding
- Oatmeal or Wheatgerm – add 1 heaped tablespoon per 1lb of fruit/veg mix
- Soaked linseed (the oily water too)
- Natural Probiotic yogurt, 1 tablespoon per 1lb of fruit/veg
- If using boiled eggs as a protein source, remove the shell and add them too (use 1 per pound of fruit/veg).
- A quarter of a teaspoon of acacia gum per 1lb of fruit/veg
- 2 teaspoons of bee pollen (Either added to the mix for a daily dose or if you wish to give less often add a pinch to the defrosted evening meal)

The SGS II diet has increased protein which the mother needs in order to nurse her offspring without losing her own body condition.

## **Diet Extras**

Extras like monkey biscuits and the dried pellet foods can be used as an addition to both the SGS I and SGS II diets to add a crunch which helps to keep the teeth and gums healthy. Insectivore Fare can be used as a protein source when you want to give some variation.

## **The Supplements**

I think it is important to know why we provide the supplements we do and what positive effects they have on gliders to give you a greater understanding of diet.

**Glider Booster and Wombaroo** are both multi vitamin supplements. You do NOT need to give both of them. Wombaroo is the better one of the two as it is higher in protein than Glider Booster. A multivitamin is important as our captive diets are nothing like their wild diets – unfortunately that is something we just cannot achieve in captivity.

Our captive diets, however, can still keep our gliders healthy for up to 15 years. The multi vitamin supplement provides everything the body needs to keep functioning. If you do wish to give them Booster and Wombaroo, then do so on alternate nights.

**Calcium** is very important for bone density and without it muscles cannot function properly so calcium is needed for fundamental things like the heart beating and breathing!

If your glider is suffering from a calcium deficiency there are small clues that you may not notice at first. Muscles tremble (not to be confused with the thermo regulation trembling) – you may notice the muscles on the back leg twitching. The glider will lose some ability to grip and release the bars on their cage, and the one you will notice is the eventual loss of use of the back legs.

Even at the hind leg paralysis stage, it is reversible. Treatment from a vet for the inexperienced is necessary and a review of the diet you are using is a must to prevent it from happening again.

I prefer to use Zolcal D as it is in liquid form so easier for the body to absorb and it also contains vitamin D which the body needs in order for it to use the calcium. Zolcal D is also recommended for treatment of calcium deficiency.

**Acacia Gum** is the main part of the wild diet, it provides complex carbohydrates and is also a soluble fibre. Acacia gum is indigestible to most animals, but gliders have an enlarged caecum to allow for the digestion of the gum. To me, that speaks volumes! If they have the means to digest it, use it!

Fibre is very important to keep the gut healthy and to keep everything moving through the gut easily. There are two types of fibre, soluble and insoluble, both are needed in the diet. Without soluble fibre there is a huge risk of constipation, without insoluble fibre there is a huge risk of diarrhoea. Both of which can cause major health issues, constipation can cause prolapse and in severe cases death; and diarrhoea can cause dehydration and again, death in severe cases.

**Bee Pollen** – Wild gliders use pollen (in its untreated form) as a protein source when insects are scarce. For the purposes of our captive gliders (and of course, some health conscious humans) we employ bees to collect the pollen, they then mix with their own enzymes which gives it a higher nutritional value than the untreated form.

Bee pollen contains all of the essential amino acids, enzymes, anti-oxidants and 27 minerals, in total there is over 96 very concentrated and extremely high quality nutrients present. It is also a metabolism booster, and boosts energy levels whilst having a low calorific value.

Nutritionally, Bee Pollen is classed as one of the best nutritional sources in the world, with 20% amino acid, 40% carbohydrate, 35% protein and just 5% fatty oils – I would eat it myself if it didn't taste so bad! The gliders don't seem to mind though.

Powdered bee pollen is preferred as it is more easily digested than the granules.

**Gliderade & Nutraglider** – Nectar is another part of the wild diet, albeit a small part – it is the only source of simple sugar wild gliders utilise. If you wish to offer flowers as part of your gliders' diet, please make sure they are from an uncontaminated source (no weed/insect killer, etc) and make sure they are NOT toxic!

Nectar mixes are just an extra, they are not what I would class as a necessary part of the diet, but they do contain vitamins and minerals. Gliderade also contains bee pollen; and Nutraglider contains acacia gum.

**Wheatgerm** is added to the diet as it contains lots of insoluble fibre which keeps the gut healthy and cleanses the system of toxins; Vitamin E which helps keep the reproductive organs healthy, is good for fur quality and works as an anti-oxidant; Thiamin which is good for the bones and skin; Vitamin B6 which keeps the metabolism in good working order and Vitamin B5 which is important in the production of energy.

**Linseed** when soaked releases an oil, which is fantastic for the fur! Linseed is rich in Omega 3 (Linolenic Acid) fatty acids and also Omega 6 (Linoleic Acid) both of which are essential fatty acids required for bodily function but are not produced by the body. Linseed is rich in anti – oxidants, and contains both soluble and insoluble fibre. I soften my linseed with a pestle and mortar to make the nutrients more easily available.

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