Pancake Tortoise (*Malacochersus tornieri*) **CARE SHEET**

By Robert Ortiz-Dietz, version 04-15-2021

Following is what has worked for me. I realize there are many successful ways of properly keeping and reproducing diverse species. Everything I share here is not a hard and fast rule but rather is meant as a guide for someone starting out without much experience with this species or wanting to know how I keep them. At no time am I implying other keepers' methods are incorrect. I hope this helps you take care of your pancakes properly. Use it and feel free to share it.

Natural History: The pancake tortoise's natural distribution is eastern Africa. They are known from Kenya and Tanzania but apparently extend to other countries to the south.

Natural Environment: This **subtropical species** lives in a specific microhabitat composed of rock crevices in large boulder outcroppings known, as kopjes, and small hillsides in the **subtropical woodland/savanna**. The habitat is marked by a **rainy and a dry season**. The outcroppings seem to be typically interspersed with bushes, small trees such as acacias, various herbaceous weeds, some succulents and grasses. The substrate depending on the location is predominantly soil with some rock splinters/gravel. Outside of the rainy season, which seems to occur mainly between October and May, there is no water. The air humidity only rises after a rainfall, otherwise it is not humid at all. What is important to remember though, is that some of the deeper crevices probably retain moisture for several weeks/months into the dry season.

Habitat ambient air Temperatures (***different from microhabitat temperatures!***) seem to move as follows:

Summer
Night time: 68-77 °Fahrenheit (20-25 °Celsius)
Day time: 82-90 °F (28-32 °C)

Winter
Night time: 61-68 °F (16-20 °C)
Day time: 79-86 (26-30 °C)

The temperatures within the rock boulder crevices remain much more stable given that the rocks act as a huge heat storage. Hobbyists who have travelled to the natural habitat during different seasons and took temperature measurements, shared with me that temps usually fluctuate very little in the deepest **crevices** and **remain between 67-85 °F (18-28°C) between night and day year-round**. Tortoises can move within the crevices to be exposed to more or less heat.

This is also the range I have observed my group of pancakes prefers in their terrariums. My night time lows in the winter do not drop under 68-70 °F (19-21 °C). Day time temps in my enclosures are 80-90 °F (26-32 °C). In the winter, the day time temps may be a couple of degrees cooler on some days.

Humidity
I find **substrate** humidity very important on the warm side hide. Some of my pancakes like it very moist, particularly hatchlings and juveniles. I keep the cool hide barely moist in the summer and dry in the winter to prevent fungal or bacterial infections. It is **very important** to note, that

pancakes **DO NOT like high air humidity**, it affects their health. Good ventilation is paramount! Well ventilated terrariums are very important! A fish tank is NOT an option as it does not have a vent at the lower level of the front or side.

Terrarium setup

There are several ways to successfully keep pancakes. Some people keep them in cattle troughs with open tops, others use ventilated glass terrariums like an Exo-Terra and yet others, including myself use wooden terrariums with glass fronts. As with all reptiles, what matters is to achieve the ideal environment and temperature/humidity/lighting ranges as well as hiding opportunities.

Some setups, such as open troughs may not work as well if these are located in a cool/cold airconditioned home but would be great in a dedicated animal room that is kept warmer overall. Here is what works well for me:

I keep my adults in a ratio of one male to one or two females. Each group lives in a 4 feet long by 2 feet wide by 18-inch-tall plywood terrariums. The top is solid. The back wall has a ventilation opening 4 inches by 24 inches covered in pet screen (much stronger and durable than mosquito screen). The front is plexiglass or glass. The front also has a vertical ventilation opening measuring 2 inches by 16 inches on one side of the (plexi)glass.

I paint the inside with one coat of water-based primer followed by one coat of latex (acrylic) trim or cabinet paint (semigloss or gloss). Any seams are sealed with caulking before painting. Finally, I apply a coat of water based acrylic flat/matte paint in an earth tone to all walls. While flat paint is not really washable, it just looks better than the higher sheens for my taste.
Most of my ceilings are painted white (the semigloss paint mentioned above), which helps with light reflection and thus making the terrarium a bit brighter.

My substrate is dirt/soil mixed with fine mulch (pesticide and color free) and less than ¼ by volume of coarse sand or rock chip.

One end of the terrarium (about one third) is on a heat tape or heat mat taped to the floor (inside), or has a spot reflector bulb (45W incandescent). If you use a glass tank, you can tape the heat tape on the underside and then place the tank on a Styrofoam or similar foamboard for insulation. Make sure to follow the manufacturer's instructions on properly installing heat tape to prevent fires or harm to your animals. Heat tapes typically need a dimmer or a rheostat/thermostat connected into the electrical line to adjust power output and thus heat.

The center third of the enclosure is open (no hides) and has a feeding plate (shoe box lid or Tupperware lid, and a small plastic container lid with water (like a mayonnaise lid). I use a small lid for water to prevent them soaking and defecating in the water. Since they have moist hides, they can get their skin moist there.

The other third of the enclosure is the cool end and is not locally heated.

Both ends have a double stacked layer of fake flag stone which I build. Each layer is separated by a 2-inch spacer. Pancakes feel safe in tight crevices. More on how to build these fake stones later. You can also use slate pieces. They are just heavier and inside a glass tank could crack the glass if the tortoises move them. The double layer allows the animals to get away from the soil and onto a dry surface if they choose to.

I like the bottom layer to extend from the back wall to the front wall and from the side wall, go 1/3 towards the center of the tank. This provides the tortoises a lot of room in their hides and

allows you to keep part of the hide moist, and another part dry. I also like to make sure all the tortoises fit under the same hide if they all want to be in the same microclimate. Therefore, my fake slates/stones are cut somewhat triangular in shape. The back and one side touch the back and side wall, the front is cut somewhat diagonally from the front galls pane to the back wall. This creates enough of an open area in the center of the terrarium where to place the food and water as well as allow space form mating.

If you have a vertical rack where one cage sits on top of another without an airgap, you may not need the heat tape as the lighting source will provide a slight heat to the enclosure above. In that case, see to it that one end of the terrarium does not get warmed by the below heat source in order for the pancakes to be able to find a temperature gradient and escape the heat. They really don't like it above 90°F (32°C) and seem to prefer hide temps in the mid to high 80's Fahrenheit (mid to high 20's Celsius).

Some people like to use basking lights instead of heat tapes. If you use a bulb or ceramic heat emitter, position it above the edge of the warm-side hides. Specially if you use natural stone which absorbs heat. This is in order to prevent the hide getting too hot. Figure out the wattage of your spot bulb or ceramic heat emitter by placing your hand on the closest surface under the bulb. It should not burn but be nice and warm.

Since I use fake flag stones/slate made from foam board, I position the reflector at the edge of the fake rock so the pancakes can bask while partially in the hide or climb up on top of the first level (my second level is smaller than the first to create a terrace. See pics further below.

The lighting source can be a UVB emitting fluorescent tube, a regular fluorescent tube (daylight color), a plant growth fluorescent tube or an LED strip/tube (daylight). I have not observed any difference in wellbeing or behavior. Other keepers report various types of lighting as well. As long as you supplement occasionally with a reptile multivitamin and mineral complex containing vitamin D3, it will be ok. I have used UVB emitting tubes for my babies and juveniles for a long time but don't run the tube all day. Rather I run an LED tube for 12 hours on a timer and set the UVB tube on a separate time that comes on for an hour during the peak feeding and activity period which for my young tortoises is mornings around 8-10am when they feed, and again around 4-5pm. My adults mostly prefer to feed around 2-3pm in the winter and 10-11am in the summer. Of course, this varies and you have to figure it out with your animals, but that is one way to do it and make your UVB bulb/tube last many years.

If you use a glass enclosure, such as an Exoterra, you may want to insulate the sides, back, and bottom of your tank with half-inch foam board or Styrofoam boards in case your terrarium is in your living room or similar airconditioned space. You may need to cover part of the top of the tank with foam board or plastic liner in order for the air temps inside the enclosure to rise into the mid to upper 80's °F (mid to upper 20's°C). Be sure to have enough space between the heat lamp and the cover to prevent a fire or melting.

If you have a dedicated animal room that you keep warmer, then the insulation is not necessary. I included a picture of a simple set up using an Exoterra. I occasionally use these tanks for raising juveniles. When using glass enclosures, a heat tape is better than an overhead bulb in my opinion. It keeps the substrate in the warm hide evenly warm. A bulb may heat up a small area under the bulb but the animal may still be sitting on cold substrate, thus potentially not thriving or even getting sick. It's analogous to us sleeping on cold concrete with a thick blanket covering us. As long as your body is touching the cold concrete, you most likely will still get pneumonia, regardless of how thick your blanket is!

Building fake slate or flag stone

As I mentioned before, I build my fake flag/slate stones form foam panels which I paint with water based flat paint and then cover in sand until dry. 2 coats on the top side. No sand on the underside. I find this easy to clean, light weight and very safe against glass breakage or crushing tortoises.

Use a ¾-inch foam board (I don't like Styrofoam as it is too brittle and breaks easily) from a construction store. Remove the protective plastic film that is on the foam board and then cut the piece to fit between one side of the enclosure and the front and back walls. The side facing the inside of the terrarium, you can shape a little with a few curves or cuts to make it look a bit more natural.

Then cut a few 1-inch-wide x 2-3 inches long strips from the spare/waste pieces that are left over from cutting the foam board. Use these strips as spacers. This will keep the fake slate off the ground and if you stack them, the stone has the right height for the pancakes to slip under.

I glue two strips on top of each other to achieve a height of 1.5 inches. I then glue these spacers to the underside of my flag/slate stone boards using either Elmers glue or paintable caulking. Position these spacer pieces along the back and side wall of the slate. Then add one piece diagonally from the back corner of the enclosure. This prevents the front of the fake rock from bending down or tipping forward.

Once the glue has set, I paint both top and underside of the board with exterior grade, acrylic/latex flat water-based paint. Use your imagination when choosing the color.

On the top side and edges only, while the paint is fresh, saturate the entire surface with about 1/4 inch of play sand or any fine sand you like and have access to. Once it dries in a few hours, flip the fake stone over and shake the excess sand off. Repaint with another coat and add sand again. I pour sand on the edges first and then lay the stone flat and add the sand to the top. On the edges, whatever sand sticks, is good enough. I also add sand to the front spacer as it is usually visible, even though I set it back a couple of inches from the edge. If you prefer more round looking rocks, just glue several layers of foam board together and once you have the desired thickness, carve the shape you want before adding paint and sand as described above.

Raising sexes apart

I raise genders apart as soon as they reach about 4 inches in length. Since males mature much faster than females, they often harass them incessantly and stress them out. In addition, when females are present, males will typically fight and the less dominant ones will avoid coming out of their hides as much and thus feed less.

Once a group of males is raised together, I have not observed any major issues. If you add another male, then there can be temporary or permanent fighting. I also observe some males eventually get aggressive as they grow and then need to be separated and housed individually or with mature females.

Male (left) versus female (right) in 4-inch (10cm) juveniles. You can sex them at smaller sizes but at 4 inches it's very clear who is who. Note the male's tail extends past the anal scute!

Growth:

I don't keep detailed records on my animals so forgive me for not inserting a nice table with stats!

Like most tortoises, pancakes grow fast. At six months they are usually already around 2 inches (5cm) long. At 1.5 years they measure about 3 inches (7.5cm) long. At about 2.5 to 3 years, they will be 4-5 inches (10-12.5cm) long. By year 5 or 6, they will be 6 inches long (15cm), their typical adult length. Nevertheless, they will not have the width and the girth (thickness) nor the weight of an adult animal. Males mature around year 3.5 to 4. Females around year 5 or 6. I find it very important to allow females to get 4 inches wide and definitely at least 1 inch thick (2.5cm) as most adults (some adults are thicker than this, usually 1.5 inches).

I like females to be at least 300grams in weight and about 6x4x1 inches (15cm x 10cm x2.5cm) in size before I allow them to breed. I had a couple of females, which I raised with males, that mated while smaller and resulted egg bound. One died! Needless to say, I felt very bad about it. It's better not to rush it. You will have plenty of offspring down the line. I invite you not to risk the health of your animal, it's not worth it.

From left to right: hatchling, 2.5 yrs., 3.5 yrs., 4.5yrs.
The 4.5-year-old female is almost as long as the adult female but lacks the weight and thickness. Another year and she will be ready to breed.

Bottom: Adult female

Saddle backs and split scutes fairly common

In my group, some juveniles have what I call a saddle back, a depression shortly after the middle of the body. In my large collection, it predominantly occurs in females, rarely in males. Since I also have a few of the wild caught individuals that are that way, though less pronounced, I know it to be natural and have observed it lessening with age as the animals get thicker.

This depression almost completely disappears once the animals are fully grown and gain in girth/thickness. They all grow as fast as all other juveniles and are just as healthy. They reproduce equally well.

Split scutes also occur occasionally, regardless of incubation temperature. Some wild caught, imported individuals in my group also have scute shape anomalies as well as bumpy shells versus smooth shells.

Most babies grow up with nice smooth shells if provided plenty of moisture in their hides.

Nevertheless, some individuals (the minority) grow slightly bumpy shells despite being raised under the same conditions and in the same terrarium with other offspring who display smooth shells. It's a natural variation.

If you keep them totally dry, you will most likely experience abnormal shell growth. With just a slight substrate moisture, the shells look bright colored versus dusty dry, as the moisture spreads throughout their shell through capillarity. Remember though, the tortoises also need access to a dry area for them to choose which condition they want:

Cool dry
Cool and barely moist
Warm and moist
Warm and dry

If your hides are large enough, this is easy to do, just keep part of the cool and the warm hides slightly moistened. Remember it's critical to NOT have a cold bottom surface. Insulate it or use very slight floor heat **upper 70's to low 80's Fahrenheit** (low to mid 20's Celsius).

Examples of naturally occurring shell deformities:

Captive bred and born 3.5-year-old female. The depression will be far less noticeable with age. This one also has a slightly bumpy shell.

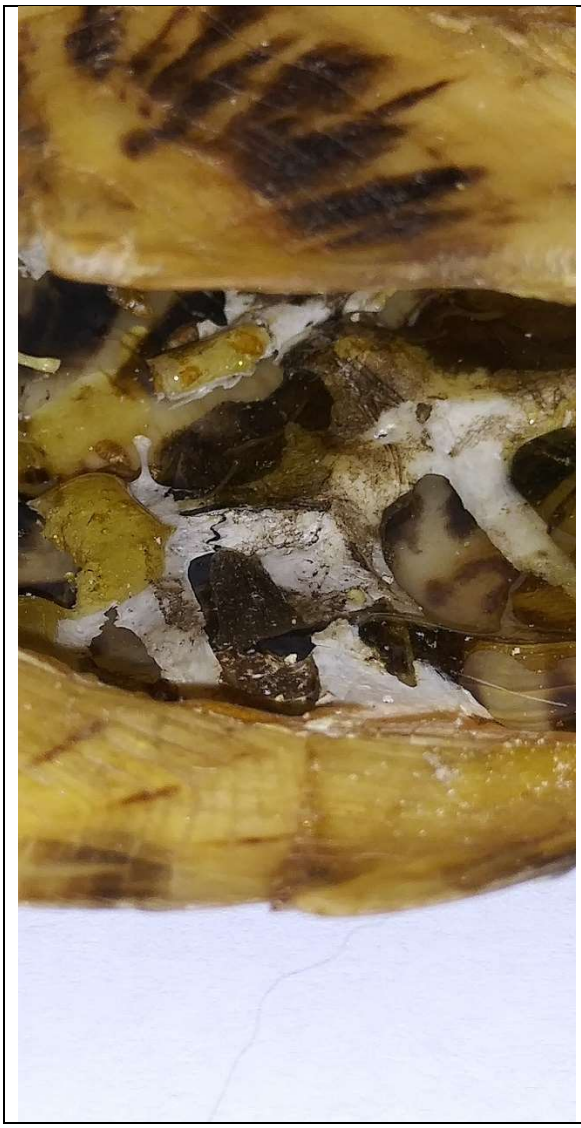
Wild caught female with saddle depression and off-shaped and split scutes. Adult females are thicker and thus the depression is less pronounced than in juveniles.

Wild caught female with off-shaped and split scutes. Same female as above

A different wild-caught female with the saddle back.

Remember these tortoises don't have a strong and continuous skeleton structure and are quite soft and pliable, hence their name: soft-shell-tortoise. They barely have any bones in their shells unlike other tortoises; it's mostly scutes held together by connective tissue.

Note how little skeletal structure there is. White parts.

	Picture above and left: barely some very thin rib-like-bone structures.

Feeding: As mentioned before, I prefer using small water dishes to prevent tortoises from soaking and defecating in them. I also place the bowl far enough from the food lid to minimize the pancakes stepping into the water bowl while feeding. Once or twice a week, I like to add 4-5 drops of trace mineral solution per one gallon of water and offer that to the tortoises to help with a balanced nutrition and optimal health.

I feed every day. During the winter months, some pancakes will eat much less and sometimes sporadically, however all my animals will eat at least 5 times per week. Most will eat daily, even if they eat less. If your animals are not eating at all, check the temps in their hides and make sure you don't have cold surfaces.

You can place the food items onto the lid of a plastic container. Depending on the season, I feed some of the plants listed below but will always prioritize weeds and wild grasses when available versus store purchased produce. You can also harvest a lot of weeds during their growing season, dry them in the sun and then chop them up finely in a blender. Then sprinkle that "powder" onto washed and still wet produce (binds the weed powder with the water droplets) to boost nutrition during months when you are not able to find weeds and wild grasses.

For store purchased items, I feed mixed spring greens (no spinach due to oxalic acid), romaine and other lettuces, kale, turnip greens, chopped or minced cactus pads (found in Mexican and Asian grocery stores), chopped okra, minced zucchini, tomatoes, bell peppers, to name a few.

Buy some “Rose of Sharon” bushes – a type of cold-tolerant hibiscus shrub- and plant them in your yard. The flowers are great food and since they wilt after one day anyway, you can use them for your tortoises after you enjoyed their color in your yard.

I also feed mulberry leaves. I have a couple of wild mulberry bushes that I planted in the yard, as well as a large tree that came with the house. They love them and are excellent nutrition.

Some people offer Mazuri tortoise food and Zoomed Grassland mix. I have not found my pancakes to like Mazzuri tortoise pellets and thus never offer them. I have not tried the Grassland mix.

I supplement once or twice a week with a mix of reptile multivitamin and a multimineral mix.

Some weeds that tortoises like and may be available in your area:

Dandelion (Taraxacum officianale)
Sowthistles (Sonchus spp.)
Hawkweeds (Pictis spp.)
Hawkbeards (Crepis spp.)
Hawkbits (Leontodon spp.)
Plantains (Plantago spp.)
Clovers (Trifolium spp.)
Honeysuckle (Lonicera periclymenum)
Cat’s ears (Hypochoeris spp.)
Vetches (Vicina spp.)
Trefoils (Lotus spp.)
Mallows (Malva spp.)
Bindweeds (Calystegia spp.)
Sedums (Sedum spp.)
Ivy-leaved Toadflax (Cymbalaria muralis)
Wild clematis
Acanthus
Nettles
Fine blade soft wild grasses
Grape leaves from wild or domesticated grape vines

You can try different weeds that you collect from non-pesticide treated yards, parks, etc. and see which ones the pancakes like. They generally won’t eat something that is not good for them.

Breeding:

Female size and weight for breeding

As mentioned before, females should be at least 300 grams in weight and 1 inch (2.5cm) thick/high, and 4 inches wide. The length can vary. Weight and thickness are the key factors in my experience.

Males try to mate throughout the year when females come out of their hides to feed. I prefer to house one male to 2 females to avoid one female getting all the attention (harassment!)
Pancakes are quite gentle and won't bite or ram their mates as other tortoises do. Therefore, they can be housed together permanently.

Provide a 6-inch-deep portion of the substrate under the warm side hides for females to dig their nest in. They typically prefer to lay there as long as substrate temps are no higher than 90F (32C). If the female test dig in other locations, she may not like the area you provided. Just add more substrate in the area she is digging and usually that does the trick. I sometimes also place a plastic shoebox filled with substrate in the terrarium and place the female on top. Then I cover part of the shoebox with a fake slate. They usually feel safe there and start digging their nest and lay.
Females typically lay one, rarely two eggs per clutch, for a total of 4-6 eggs per year. Some females lay more than that but it's not typical.

Carefully uncover them and don't rotate them. Mark the top with a soft pencil and place them in the incubator (or a warm area of your animal room inside a deli cup) in exactly the same position you found them (with the pencil mark up).

Many substrates can be used such as the soil mix described for the terrariums, vermiculite, perlite, garden soil free of pesticides and additives, fine bark mulch, coarse sand, etc. Some people keep the substrate slightly moist; I prefer to use dry vermiculite and place a small water container with lots of holes in the lid, inside the same plastic box. This provides enough air humidity.

As probably all tortoises, pancakes are Temperature Sex Dependent.
At **88-91F** (or 31-33C) you will hatch almost exclusively females.

Between **77-82F** (25-28C) you will hatch mainly males.
Around **84-86F** (29-30C) produces both genders.
Length of incubate varies greatly depending on temperature and the individual egg itself. At higher temps, the incubation period lasts anywhere from 3 to 6 months, at lower temps, it typically takes 6-9 months. Even eggs incubated in the same container may hatch weeks or months apart. It is probably a survival mechanism. Unless the eggs smell or have little flies on them and/or are cracked, leave them alone.

Once the babies hatch, I leave them in the incubator for 24-48 hours until their yolk is absorbed and the umbilical area has closed. Then I transfer them to a separate container with part of the substrate being moist (paper towels or regular terrarium substrate). If you use paper towels, its harder to keep both a dry and moist area due to the capillarity of the paper. Be sure to keep part of the hides dry so they can choose a warm and moist or warm and dry area, as well as a cool and moist and cool and dry area.

In a few days, the hatchlings flatten out and the marginal scutes stretch out. They will usually feed as soon as they are placed in the terrarium. Provide a small, very shallow plastic container lid with a ¼ to ½ inch of water at all times for them to drink and soak in. Make sure they have a warm side and a cooler side, each with a shallow hide. They like to feel the sides and top of the hide if possible, to feel safe. Keep the hides slightly moist and make sure the terrarium walls are not cold. Insulate them if necessary. Sometimes I place the plastic containers, where I initially keep the babies, inside the terrarium of an adult group of tortoises, to ensure good temps.

The care for hatchlings is the same as described above for juveniles and adults. Substrate moisture is very important to ensure smooth shell growth and happy pancakes. After 4 to 6 months, you can start seeing the color pattern develop as the growth rings emerge. When they hatch, you can’t tell what they will look like at all.

I hope this helps!