

TORTOISE HIBERNATION

Hibernation is a natural part of many reptiles' annual cycle but also the time of year most likely to be associated with health problems. Immunosuppression, dehydration, freezing, rodent attack or other trauma may all be seen. However, hibernation does have advantages even in the captive reptile, slowing growth and allowing natural annual hormonal fluctuations.

SHOULD MY TORTOISE HIBERNATE?

- Hibernation is only suitable for those species which would naturally be exposed to adverse weather.
- Suitable species include most Mediterranean Tortoises, Horsfields and the Desert Tortoise.
- Do not hibernate Leopards, African spurred (Sulcata), Southern Turkish spur thighs, Egyptians, Libyans, Tunisians & other North African variants, Red-foots, Yellow foots and most turtles.
- Any individuals hibernated should not have had significant health problems within the previous year and be of a sufficient size.

HOW TO PREPARE FOR HIBERNATION?

- During August and September, as the days grow shorter, the light intensity decreases, the temperature begins to fall and tortoises prepare for hibernation.
- Annual pre-hibernation vet checks for any underlying illness are strongly recommended in the autumn
- A faecal sample may also be screened at this point to ensure tortoises are not entering hibernation with an excessively high parasite burden.
- Feeding may then be stopped but tortoises kept warm for the first week to allow digestion.
- After this, temperatures may be slowly reduced by ~5°C per week until hibernation. This may be by allowing the tortoise to spend increasing time outside (in outhouse/ cold frame etc), as this will allow exposure to a shorter day length and decrease in environmental temperature. Still bring the tortoise in overnight but do not provide a basking site.
- For tortoises maintained inside, the temperatures and lighting provided should mimic the natural levels to encourage hibernation. Typically the basking site is left on (but only for nine hours) for the first week and then turned off for the next three weeks. Any thermostatically controlled heat sources should have the temperature reduced slowly.
- Bathing should be continued at least every other day to ensure a tortoise enters hibernation with a full bladder as this will be an important fluid reservoir for them during hibernation.
- Once body temperature is around 13°C, the tortoise can be moved to a refrigerator or hibernation box and maintained between 2-9°C.

TYPES OF HIBERNATION

1. **Self-hibernation** – not advised
2. **Box hibernation** – double box for insulation – needs to be secure and rodent proof
Use a large, wooden, rodent-proof tea-chest or box, with small air holes in the sides. Both the top and the holes should be covered in wire mesh to prevent vermin entering.
Line the base and the sides of the box with thick pads of polystyrene or newspaper. Place the tortoise in an inner box with air-holes and filled for one to three-quarters with polystyrene chips, dry leaves or shredded newspaper. Avoid hay or straw. Place the smaller box inside the larger one, making sure you can open it easily for check-ups.
3. **Fridge hibernation** – good in principle as a hibernation temperature of $\sim 5^{\circ}\text{C}$ is achieved.
However the temperature is variable depending on the position in the fridge (higher is slightly warmer). The inclusion of a thermal probe or max/min thermometer is required to ensure the correct temperature is achieved. Fridges will also tend to dry out the air inside them and the humidity will be too low. The ventilation is also poor. The solution to the short comings is to open the door daily (just for 30 seconds) to allow for ventilation and assessment. Placing a bowl of water in the bottom of the fridge and keeping it topped up will allow for the humidity to be maintained. A chiller cabinet does have some advantages over a fridge as direct visualisation is possible through the glass door. Many are fan assisted and this improves ventilation. There is no need to insulate tortoises hibernated in this way, although many people prefer to provide some substrate to allow the tortoise to bury itself.

DURING HIBERNATION

- Whichever method is chosen, it is important to ensure that temperatures are kept constant at $\sim 5^{\circ}\text{C}$ for the hibernation period. Tortoises kept below freezing point can lose their eyesight or at worst their lives. Use a maximum and minimum thermometer (obtainable from garden shops or online) to check temperature changes.
- For every drop of 10°C the heart rate drops 50%. At 4°C the respiratory movements are negligible. If the tortoise is kept too warm and becomes too active it will use up its fat and of glycogen or animal starch stored in the liver, the latter is needed on emergence from hibernation.
- Your tortoise can be carefully weighed individually or complete with inner box every one to two weeks.
- An adult tortoise loses about 1% of its pre-hibernation weight per month, so a 1000g tortoise is allowed to lose 10g monthly. A drastic weight loss ($>8-10\%$ loss) indicates something is wrong: the animal should be brought out of hibernation immediately, checked and disease investigated.

POST – HIBERNATION

- The decision to wake your tortoise up may be as soon as six weeks (for juveniles just learning the process) or up to three months after going into hibernation.
- Bring out of hibernation slowly, check for discharges from the nose, eyes and tail end. Inspect it carefully, bath the face and eyes and wash the mouth.
- Leave at room temperature for the first few hours.
- Then a warm bath can be given for at least half an hour. This can be repeated twice daily. It is important that the tortoise empties its bladder to get rid of the toxic waste accumulated during hibernation and that it replenishes its water supply by drinking. Monitor urination and defecation. If this does not occur then a visit to the vet is required so the tortoise can be rehydrated and further investigations performed as required.
- Keep the animal warm (in vivarium or heated enclosure), until the days get sufficiently warm for the tortoise to go outside. Keep the tortoise indoors overnight until the nights get warmer.

- Feed succulent foods initially before weaning back to a normal diet
- Once out of hibernation and eating, keep it active (as for overwintering) if the weather becomes cold again. Warm spells in February breaking hibernation are a hazard of the British climate.
- Any tortoise that is not feeding or has not urinated within seven days of emergence from hibernation, or if it appears ill, should be taken to a veterinary surgeon with an interest in tortoises without delay.

WHAT IF MY TORTOISE DOESN'T HIBERNATE?

- Any tortoise which is underweight or suffering from an ailment should not be hibernated, but overwintered in a vivarium. This should have a heat source and full spectrum light (including UV-a and UV-b outputs) for 13-14 hours to prevent hibernation. A basking area is created using a spot bulb, providing a basking temperature of 40°C. This should be kept on all day. The cool end should be maintained at 25°C. Background heat is important with this set up and a stable room temperature is required. Heat can be provided with a heat mat (on the back wall) a tubular heater, a heat plate or a ceramic bulb. This should be set on a thermostat so that the overnight temperature does not drop below 25°C. The temperatures should be measured with a maximum/minimum thermometer. During the cold winter months careful checking is required to ensure the heat sources are keeping the tank sufficiently warm. Heat sources should be guarded or kept at a height to prevent thermal burns. A simple vivarium can be provided with the light source on one end and a shelter on the other. Never allow the temperature to go below 15°C (60°F).

