

# HIBERNATING YOUR MEDITERRANEAN TORTOISE

By Richard Hazard MA VetMB MRCVS

## When?

Wild Mediterranean tortoises in their natural habitat hibernate for only 1-2 months starting when day length and temperature drop. In the UK, tortoises use similar cues to regulate their hibernation period and due to our colder climate can often hibernate for up to 6-7 months. Unfortunately, this is a common reason why many tortoises do not awaken in the spring!

The important question to ask is 'for how long' rather than 'when'. A tortoise should **NOT be hibernated for longer than 16 weeks** (4 months) and preferably for only **4-12 weeks** (1-3 months). An unhealthy tortoise should not be hibernated at all, but rather over-wintered during the colder months (see later).

Tortoises that are hibernated for prolonged periods can exhaust their energy reserves resulting in poor health and an impaired immune system. This is a common cause of post-hibernation anorexia in tortoises.

In the UK, tortoises kept outdoors will naturally start to prepare for hibernation around September. If your tortoise is allowed to hibernate this early, it will have to be housed indoors after awakening until the outside environment is adequate. It is therefore advised that most tortoises are housed inside from around September and are not hibernated until mid-December.

**Some species of tortoise do not hibernate**; therefore please seek advice if you are unsure of which species of tortoise you have.

## Pre-hibernation Examination

Ideally all tortoises should have a pre-hibernation check with a veterinary surgeon to ensure they are clinically well. This should occur well in advance of your planned hibernation date in case action is required (i.e. October if planning to hibernate in December).

You should **NEVER** hibernate your tortoise if it is unhealthy. It is perfectly fine and beneficial for these tortoises to be over-wintered instead.

The tortoise should be weighed and measured in order to assess body condition (they need to be well hydrated with sufficient levels of body fat to survive hibernation) and your veterinary surgeon will also examine the tortoise's eyes, nose, mouth and cloaca to check for evidence of infection and disease. If there are any health concerns, faeces and blood may be collected to check for internal parasites and organ function respectively (routine faecal analysis is available if you are concerned about internal parasites in your tortoise).

## Over-wintering (Non-hibernation)

If your veterinary surgeon decides that your tortoise is not fit to hibernate then it should be kept indoors until the outside weather is acceptable.

The tortoise must be housed in an area where adequate heat and UV radiation can be provided. A focal source of warmth such as a heat lamp must be provided at one end of the enclosure to maintain a basking temperature of  $\geq 40^{\circ}\text{C}$ ; the other end of the enclosure should approximately  $27^{\circ}\text{C}$ . A source of UV radiation must also be provided and situated within 15-30cm (depending on the UV source) of the tortoise to be of any benefit. The UV radiation must **NOT** pass through glass/plastic or fine mesh as this will absorb nearly all of the UV radiation. Self ballasted mercury-vapour lamps are ideal as a source of both heat and UV radiation (these work at distances greater

than 30cm but should never be used in an enclosed vivarium).

This set-up, with at least 9 hours of illumination per day, will provide an adequate artificial environment in which your tortoise will continue to eat and stay healthy (assuming he is being fed a correct diet). Please ensure your tortoise has an area within which to hide, a bowl of water large enough to hold the tortoise (and from which it can escape) and a temperature gradient from one side of the enclosure to the other. Open-top enclosures are ideal as closed vivariums tend to over-heat or not produce a sufficient temperature gradient for tortoises.

For more information regarding tortoise housing please consult your veterinary surgeon or the further reading section at the end of this hand-out.

## **Inducing hibernation**

If you have an indoor tortoise or you have brought your tortoise inside to prevent prolonged hibernation, you will need to induce hibernation at the appropriate time. This requires environmental manipulation to create autumnal conditions.

Slowly reduce the average temperature by 1°C daily until it reaches 15°C and at the same time slowly reduce the number of hours of light and UV-radiation daily (if you use a mercury vapour lamp raising this will cause all these parameters to drop).

**A tortoise must be starved for a minimum of 3-4 weeks** prior to hibernation to allow time for all gut material to be passed out of the tortoise. Any remaining gut material will become rotten during hibernation. Most tortoises will starve themselves as the temperature drops but some continue to eat and so access to food must be prevented for a month before hibernation.

Tortoises should be bathed daily to ensure they are adequately hydrated. This is especially important once they stop eating.

## **How?**

The tortoise should be placed within a small box that is large enough to incorporate the tortoise surrounded by a couple of inches of insulating material (shredded paper is ideal and straw should be avoided as it can harbour mould spores).

The ideal place to put this box is inside a spare chiller cabinet as this allows you to closely control the ambient temperature. **NEVER** use the fridge in which you keep your food as tortoises can carry salmonella, which can cause food poisoning. Temperature should be monitored daily using a maximum/minimum thermometer (available from any good garden or DIY shop) and kept between **3-7°C**.

If you do not have a spare chiller cabinet, place the box within a larger one made of wood or thick cardboard and again pack insulating material such as shredded paper or polystyrene chips between the two. This allows the tortoise some room for movement but prevents it from coming into contact with the outer surfaces of the second box where it could easily freeze. This box should then be placed somewhere where the temperature is within the ideal range and does not fluctuate.

**The temperature must never go above 10°C(50°F) or below 0°C(32°F)**. If the tortoise becomes too hot, its metabolism will increase thus exhausting energy stores more rapidly. Too cold and the tortoise will freeze resulting in serious injuries including blindness (the following picture shows a tortoise with eye trauma likely secondary to frost damage).



Regardless of where you keep your tortoise, please ensure that no rodents or foxes can gain access to them during hibernation. Do NOT create air holes in the top of the boxes as these will only act to allow the entrance of vermin/insects. The oxygen contained within the box is sufficient for the hibernating tortoise so long as the correct temperature is maintained and regular checks are performed (creating multiple air changes).

## **Monitoring**

It is a common misconception that once a tortoise has entered hibernation it should not be checked in case it is inadvertently awakened. The complete opposite is true and we should be monitoring the hibernating tortoise every 2 days as a minimum and checking the ambient temperature daily. Frequent weighing is important to check for excessive weight loss - more than 1% monthly weight loss is cause for concern. Any evidence of activity should be noted as this implies improper hibernation. If the tortoise shows evidence of having urinated (kitchen roll placed beneath them is ideal for this purpose) then advice should be sought as urination can lead to severe dehydration. Seek veterinary advice if your tortoise displays any of the above problems as it may be necessary to bring him out of hibernation early.

## **Awakening**

As previously mentioned a tortoise should not be hibernated for longer than 16 weeks and preferably for only 4-12 weeks. Prolonged hibernation will result in your tortoise exhausting all of its energy reserves and is a common cause of post-hibernation anorexia. When it is time to bring your tortoise out of hibernation you should slowly increase the temperature over several hours until it is greater than 15°C. Once movement is observed you can transfer your tortoise back to an enclosure where over the following 48 hours you can slowly increase the amount of heat and light until it reaches a normal temperature (27°C). They should be bathed daily and have their weight/appetite monitored until they return to normal.

## **Post-hibernation Examination**

After hibernation it is advisable to take your tortoise to visit your veterinary surgeon to check that it is still healthy. Your veterinary surgeon will discuss hibernation, the summer ahead and appropriate diet. They will also check for any signs of disease as mentioned previously.

It is vital that you seek veterinary attention if after hibernation your tortoise:

- ⤴ Has lost greater than or equal to 10% of pre-hibernation bodyweight,
- ⤴ Hasn't urinated or drunk within 4 days,
- ⤴ Hasn't eaten within 7 days,
- ⤴ Displays any abnormal signs such as discharge from the eyes, nose, mouth or cloaca or any evidence of trauma.

## Summer Housing

If your tortoise is not normally housed indoors then once the outside temperatures are warming up, around March, you can consider placing your tortoise outside again. Please ensure that they cannot escape their enclosure, that they will be safe from predation, have a safe enclosed area to use as a hide and that you can bring them inside if the temperature is likely to drop close to freezing.

If you house your tortoise indoors then a similar set-up as described for over-wintering can be used (again if you have any concerns please consult your veterinary surgeon). However, Mediterranean tortoises thrive outside during the summer months and will benefit greatly if you can provide this.

Please note that housing your tortoise inside a greenhouse is NOT ideal unless he also has access to outside sunlight or has an UV light. Some specialist greenhouses can have roofs that allow the correct spectrum of UV to be transmitted but most 'normal' glass or plastic roofs will absorb almost all of the UV radiation and as such are unsuitable.

## Diet

This is possibly the most important factor when it comes to keeping your tortoise healthy and fit for hibernation and this healthy diet must be provided throughout the year.

Tortoises require a diet that is **high** in fibre, vitamins and minerals and **low** in fats, carbohydrates and proteins.

The best things to feed a tortoise are non-toxic, uncontaminated weeds. A small amount of vegetable matter can be fed in moderation but should not be required.

Head lettuces such as iceberg lettuce are not advisable as the main constituent of a tortoise's diet as they contain very limited quantities of vitamins and minerals.

Food such as cabbage, spinach, chard, bok choy, peas and beans and any vegetables related to these are probably best avoided as they inhibit the absorption of calcium from the diet – a very important aspect of tortoise nutrition. Peas and beans are also high in proteins.

Mediterranean tortoises are vegetarians and meat products should never be fed. They contain high levels of urea and fats resulting in subsequent kidney and liver disease. They also contain high levels of phosphorus which can lead to Metabolic Bone Disease.

Pelleted foods are available and are good for debilitated tortoises but their energy and protein levels are generally quite high and are ideally avoided as long-term diets.

Some examples of things to feed a Mediterranean tortoise are (please ensure they are free from weed killer/pesticides, etc):

- ^ Dandelions,
- ^ Sowthistle (a very common weed),
- ^ White (Dutch) clover,
- ^ Naturally occurring non-toxic weeds,
- ^ Rocket (*use in moderation as high in goitrogens*),
- ^ Watercress (*use in moderation as high in goitrogens*),
- ^ Rose petals and leaves,
- ^ Hibiscus flowers and leaves,
- ^ (Romaine or red leaf lettuce – in very limited quantities).

A well balanced diet should ensure that your tortoise meets all of his nutritional requirements, with dandelions being ideal, but vitamin and mineral supplementation is advisable. Sprinkling your tortoise's daily meal with a calcium supplement (such as calcium carbonate powder) will help to meet their calcium requirements. If they are young then also supplementing with Vitamin D every other day is recommended (e.g. Nutrobal, Vetark).

Another important constituent of tortoise diets is Vitamin A. This can also be added to the diet sparingly (due to the risk of toxicity) as a multi-vitamin powder (e.g. Arkvits, Vetark). Below is a picture of a tortoise with an inflamed eye, this can be secondary to hypovitaminosis A especially in terrapins.



## Important Points

1. Never hibernate a tortoise for greater than 16 weeks and preferably only **4-12 weeks**.
2. Some species of tortoise do not hibernate, therefore please seek advice if you are unsure of which species of tortoise you have
3. Ensure your tortoise is healthy before considering hibernation (i.e. pre-hibernation vet check).
4. Ensure your tortoise does not eat for at least **3-4 weeks** before entering hibernation.
5. Ensure you monitor your tortoise adequately during hibernation, check temperature daily (always greater than **0°C[32°F]** and below **10°C[50°F]**) and weight monthly (no more than 1% body weight per month).
6. It is vital that you seek veterinary attention if after hibernation your tortoise:
  - Has lost greater than or equal to 10% of pre-hibernation bodyweight,
  - Hasn't urinated or drunk within 4 days,
  - Hasn't eaten within 7 days,
  - Displays any abnormal signs such as discharge from the eyes, nose, mouth or cloaca or any evidence of trauma.
7. Ensure you feed your tortoise an adequate diet with enough calcium, Vitamin D (or direct sunlight) and Vitamin A.

## Further Information

<http://www.tortoisetrust.org/> - a comprehensive website with lots of information regarding tortoise care. A must read for all tortoise owners.

<http://www.uvguide.co.uk/> - a UK based website dedicated to researching the use of ultraviolet light in reptile husbandry.

<http://www.tortoisetrust.org/articles/Animal%20Welfare%20Act%20Tortoise%20Housing.pdf> - an in depth guide to the requirements of tortoise vivarium design.

<http://www.thetortoisetable.org.uk/> - a site "dedicated to the provision of information on good, not-so-good and poisonous plants for tortoise keepers.