



## Tortoise Hibernation

The evolution, development and biological adaptations shown by this remarkable group of animals includes hibernation as a survival strategy in some species. Hibernation occurs when:

- day length is reduced
- food supplies are too low for survival
- temperatures are too low for activity

### Species which hibernate:

Mediterranean species		Russian/Steppe tortoise
<p>Testudo graeca</p> 	<p>Testudo hermanni</p> 	<p>Testudo (Agrionemys) horsfieldii</p> 
<p>Testudo ibera</p> 	<p>Testudo marginata</p> 	

### Whether to hibernate – Questions

Is it a species which hibernates?	Is it wound and injury-free?
Is it a suitable weight compared to its length?	Has it been feeding well?
Is it healthy and without parasites?	Is it urinating and defaecating normally?
	Is it fully hydrated?

### Preparation: three stages

1. Maintain at normal vivarium temperatures for 7-10 days, without food, daily bath, night temperatures 15°C
2. Maintain at room temperature for 7-10 days, without food, daily bath, night temperatures 10-15°C
3. Last 7-10 days reduce temperatures to 10-15°C, without food or bathing

**Health Check: Eyes, ears, nose, legs, cloaca – all normal**

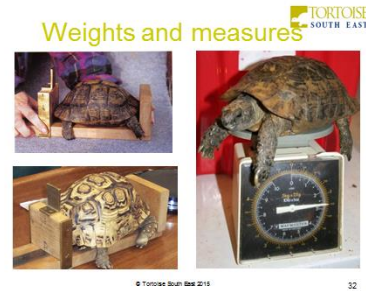
**Parasites: Check worm and flagellate count with faecal sample and treat if necessary**

**Digestive system: must be empty of food; no defaecation for final 7-10 days of preparation**

**Bathing stimulates defaecation and allows full hydration and full bladder**

**Weights and Measures:**

**Calculate Bone Ratio**  
**L = Straight carapace length in cm**  
**W = Weight in grams**  
**Bone ratio N =  $W \div L^3$  =  $\frac{\text{weight in g}}{\text{length in cm}^3}$**   
**This is the Bone density ratio**



**E.G. 1**  
**Tortoise weighs 1310g and is 20.4cm long**  
 $\frac{1310}{(20.4)^3} = \frac{1310}{20.4 \times 20.4 \times 20.4} = \frac{1310}{8489.66}$   
**= 0.15**  
**= Bone density ratio**

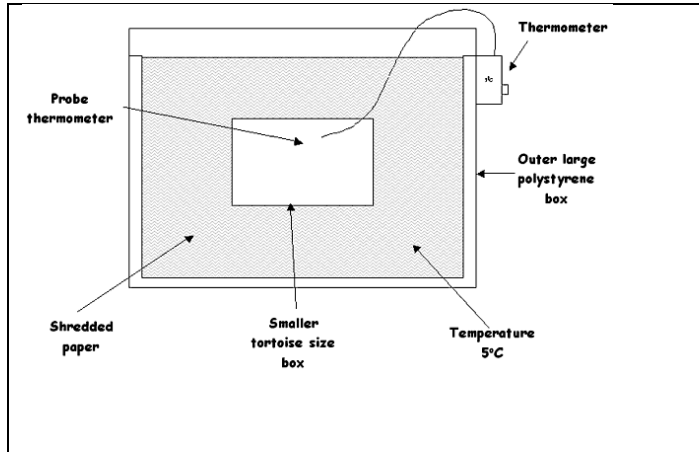
**E.G. 2**  
**Tortoise weighs 1720g and is 20.4cm long**  
 $\frac{1720}{(20.4)^3} = \frac{1720}{20.4 \times 20.4 \times 20.4} = \frac{1720}{8489.66}$   
**= 0.20**  
**= Bone density ratio**

**Healthy tortoise less than 15cm length**  
**N is between 0.22- 0.25**

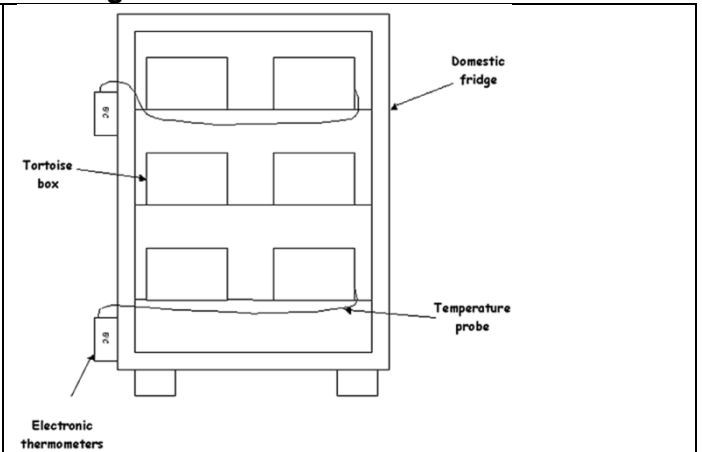
**Healthy tortoise greater than 15cm length**  
**N is between 0.21- 0.23**

**If  $N \geq 0.25$  obese/If  $N \leq 0.17$  light do not hibernate**

**Where to Hibernate:**  
**Brick Out-house**



**Fridge/Cooler**



**How Long to Hibernate:**

In captivity - Depends on age and weight

- From one year – short hibernation 2-3 weeks
- Mature adults – 8 weeks maximum

**Hibernation conditions:**

Temperature must remain as constant as possible between 4-8°C

Regular inspection is needed

Can be weighed without problem

Excessive movement – temperature too high

Urination/ defecation – hibernation must be abandoned

#### **After Hibernation:**

- Bring tortoises back to room temperature
- Movement will be seen
- Eyes open (sometimes need bathing)
- Put into vivarium to allow basking to reach around 30°C
- Bath daily – at least two urinations should be seen after hibernation – removes toxin build up in bladder
- Feeding should resume within 24 hours

#### **Normal activity resumes:**

#### **Temperature regulation:**

All Chelonians have a PBT (Preferred Body Temperature).

This is a range of temperatures:

Daily: e.g. 20°C-30°C

Seasonally: e.g. Min 15°C Maximum 36°C

#### **Things that can go Wrong**

- Freezing – leading to blindness
- Rodent damage – tortoises are easy prey
- Dehydration – toxins in blood raised
- Metabolic bone disorder – small lungs
- Rhinitis/RNS – breathing difficulties