



# Metabolic Bone Disease (MBD)

By: Davina B, George F, Ben L, Aaron N, and Jasmin S



(Image credit: Reptile Guide, National Geographic, Myths and Facts about Bearded Dragon Care, Chinese Water Dragon Care Guide, [Amazon.co.uk](https://www.amazon.co.uk), Orthobridge Institute)

## What is MBD?

Metabolic Bone Disease is the weakening of the skeletal structure and muscular contractions in reptiles, along with mammals/birds in rarer cases.

Although MBD is commonly seen in captive Iguanas and Bearded Dragons – due to the improper balance of Calcium and Phosphorus in their given diet – Turtles and Tortoises can also be susceptible to a less sturdy shell, and birds may struggle with flight as a result of soft or malleable bones within the wings.

## What causes MBD?

Calcium deficiency can cause weakened muscle contraction, poorer blood clots, and cardiac failure. However, calcium deficiency isn't the only cause of this; it can also occur if there is too much phosphorus in the body. In other words, the body needs the correct ratio. So, if the ratio of calcium to phosphorus isn't ideal, the body reacts by secreting parathyroid hormones. These hormones signal to the body that it needs to obtain more calcium from any sources available, causing calcium to be taken from the bone (and thus weakening them). An imbalance of calcium and phosphorus may be caused by:

- Not enough calcium/phosphorus in the diet.
- Too much fat in the diet
- Insufficient lighting (lack of UVA/UVB light)
- Insufficient heat source



Here are two different bearded dragons. Can you spot which one is showing signs of MBD and which one is healthy? How can you tell?



## Treatment for MBD

MBD can't entirely be reversed in most cases. However, if the husbandry, which includes the correct diet, lighting and supplements are corrected, the bones which are affected will then become stronger. For serious cases, short term prescriptions of calcium may be issued along with an absorbent to make the process quicker.



What do you think is more important: Treatment or Prevention?

## Species affected by MBD

Metabolic bone disease most commonly affects captive reptiles – though it may also affect captive mammals and birds with improper care. Green Iguanas are especially susceptible to MBD and may exhibit symptoms such as muscle twitches, tremors and an inability to raise the body from the ground. These symptoms may worsen when the animal is stressed by handling and movement.



MBD



## How can MBD be prevented?

- A balanced diet rich in calcium, phosphorus, vitamin D3 and protein.
- For certain species (e.g. hedgehogs) avoid chemical use in gardens, instead use natural alternatives

### FOR REPTILES SPECIFICALLY:

- Sufficient exposure to UVA / UVB light rays, for around 12 hours a day.
- Sufficient enclosure size for the reptile to exercise and move around.
- Dark/Light cycles.
- Proper heat gradients, as reptiles are ectothermic (they are cold blooded, so their body temperature is regulated by external sources).
- A mix of vegetables in the diet, including leafy green vegetables which are nutrient rich.