

BODY CONDITION SCORES FOR DESERT TORTOISES



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Introduction

Body condition scoring serves as a management tool originally developed for domestic livestock. It is a visual appraisal system that estimates the average body energy reserves of animals without using scales, calipers, or calculators. This system gives a relative score to each individual for its level of body reserves in the form of muscle and fat. The body condition score (BCS) is based on an evaluation of muscle mass and fat deposits in relation to skeletal features.

We have adapted this concept to the adult desert tortoise to help assess an individual's current body condition. Since individuals can vary in size and shape, weight alone is not a good indicator of body condition. This score is dynamic and should improve if the animal is eating and body energy reserves increase. Conversely, the score will decrease if inanition persists or body energy reserves are depleted.

A tortoise's body condition will change with life stage, stage of reproduction, season of the year, drought, food availability, and disease. Therefore, this tool can be used to monitor and compare populations over time.

Body Condition Scoring:

BCS is a score that ranges from one to nine with one being emaciated and nine being extremely obese (see chart below). Assigning a BCS is a two-step process. The numbers are divided into 3 groups: 1-3, 4-6, and 7-9.

STEP 1: Choose the grouping that best describes the tortoise at this point in time.

- a) Under condition (1-3), best assessed by degrees of temporalis muscle atrophy
- b) Acceptable or good condition (4-6), best assessed by degrees of temporalis muscle development
- c) Over-condition (7-9), best assessed by degrees of subcutaneous fat deposition

STEP 2: Fine tune the score by choosing one of the 3 numbers in the range using the descriptions below. Choose the best fit for the individual at this point in time.

Reference Point	1	2	3	4	5	6	7	8	9
Sagittal crest visible	extreme	yes	slight	no	no	no	no	no	no
Sagittal crest palpable	yes	yes	yes	slight	no	no	no	no	no
Temporalis muscle developed	no	no	no	slight	yes	yes	yes	yes	yes
Muscle atrophy (limbs)	extreme	yes	yes	slight	no	no	no	no	no
Subcutaneous fat (pre-femoral space)	no	no	no	no	no	slight	yes	extreme	extreme
Subcutaneous fat (limbs and tail base)	no	no	no	no	no	slight	slight	yes	extreme

1. Emaciated: Sagittal crest very prominent due to severe atrophy of temporalis muscle. Loss of this muscle mass gives the top of the skull a concave appearance. Obvious muscle atrophy of forelimbs (distal limb may be concave). Animals in this poor condition are usually weak and listless (limbs may be limp, head/neck do not retract into shell). Coelomic cavity devoid of ingesta (tortoise feels very light unless stone or eggs present).



2. Very Thin: Sagittal crest easily visible and palpable. Temporalis muscle reduced and concave. Distal forelimbs atrophied and bones easily palpable. Similar to BCS 1 but may be more active and alert. Coelomic cavity lacks ingesta (tortoise feels light unless stones or eggs are present).



3. Thin: Sagittal crest palpable and slightly visible. Temporalis muscle has an irregular appearance (concave to flat). Loss of muscle mass of distal forelimbs but not concave, bones not easily palpable.



4. Lean: Sagittal crest not visible but slightly palpable. Temporalis muscle slightly palpable but has a flat appearance, and there is not a clear delineation between the right and left sides on the top of the head. Moderate amount of muscle mass on the distal forelimbs, bones are not palpable.



5. Good: Sagittal crest is not visible or palpable. Temporal muscle mass is developed on the top of the head and has a bi-lobed appearance. Moderate amount of muscle mass palpable along proximal forelimbs. Muscle mass along anterior aspect of forelimbs convex.



6. Very good: Temporal muscle mass is developed on the top of the head and has a bi-lobed appearance. Moderate amount of muscle mass palpable along proximal forelimbs and has a convex appearance. There is slight subcutaneous swelling in the cervical, axillary, or pre-femoral area.



7. Fat: Temporal muscle mass is developed on the top of the head. Forelimbs appear very rounded. Subcutaneous swelling in cervical, axillary, and/or prefemoral regions. Slight subcutaneous fat deposition along limbs and tail base.



8. Obese: Temporal muscle mass is developed on the top of the head. Forelimbs appear very rounded and skin folds may be present. Subcutaneous swelling in cervical, axillary, and prefemoral regions. Subcutaneous fat deposition along limbs and tail base.



9. Morbidly Obese: Temporal muscle mass is developed on the top of the head. Forelimbs appear very rounded and skin folds may be present. Pronounced subcutaneous swelling in cervical, axillary, and prefemoral regions in addition to limbs and tail base. Tortoise appears too big for its shell and cannot retract limbs completely into its shell.

