

BODY CONDITION SCORING: CAMELS



BASICS

OVERVIEW

Body condition scoring (BCS) is a subjective clinical evaluation technique used to estimate the amount of adipose tissue stores.

- Camelids have a great variability of body type and conformation even within the same species. Therefore weight alone is not a good indicator of body condition
- Body condition scoring (BCS) does not replace actual weighing. Both should be considered if possible
- A single score is usually not helpful. It is the variation of the BCS that needs to be stressed
- Body condition scoring is a good management tool to evaluate if the nutritional demands required by specific physiologic situations (particularly lactation and late pregnancy) are being met.
- • In addition, body condition scores allow monitoring animals through a change in feed or feeding systems.
- • In range animals' changes in body conditions scores are important in the evaluation of the nutritive value of pastures

INCIDENCE/PREVALENCE

- Camel BCS monitoring is required for monitoring of health status all domesticated and wild herds of camels

GEOGRAPHIC DISTRIBUTION

- Worldwide

SYSTEMS AFFECTED

- Musculoskeletal
- Other systems (reproductive, neurologic) may be affected in cases due to large variations in BCS
- BCS changes reflect effect of chronic diseases and malnutrition

PATHOPHYSIOLOGY

- Body adipose tissue reserves represent a good reflection on the state of energy balance of an animal
- In situation of positive energy balance, the animal's body stores extra energy in the form adipose tissue while in states of negative energy balance the store fat is mobilized
- Camels are peculiar in that adipose reserves are stored in select areas of the body most notably the hump in dromedary camels (*C. dromedaries*) or humps in the case of Bactrian camels (*C. dromedaries*)

- The ability to store large amounts of fat in the hump(s) is one of the cardinal adaptation mechanisms to the harsh condition of the desert where nutritional resources are often limited and subject to great seasonal variation
- Weight and energy balance variations have profound effect on several biological functions such as thermoregulation, reproductive function in the female (ovarian activity, conception and maintenance of pregnancy, and lactation), reproductive function in the male (libido, spermatogenesis)
- Severe loss of body condition (mobilization of adipose tissue) may cause metabolic disorders most notable is hepatic lipidosis.
- Obesity has been incriminated in decreased reproductive function

SIGNALMENT

Species

- Dromedary (*C. dromedaries*)
- Bactrian camel (*C. bactrianus*)

HISTORICAL FINDINGS

- Routine herd health visits
- Poor production
- Poor reproductive performance
- Increased rate of metabolic disorders

PHYSICAL EXAMINATION FINDINGS

- In camels, body condition is scored of a scale from 1 (emaciated animals) to 5 (obese animals) or from 1 (emaciated) to 9 (obese) depending on preference.
- The animal is evaluated from a caudal and dorsal aspect and from the side. The body areas that should be evaluated in order to determine the BCS in camels are:
 - Back line
 - Tail head
 - Sacral ligaments
 - Pins
 - Spinal processes
 - Hooks
 - Flank
 - Transverse processes
 - Ribs
 - Brisket
 - Hump(s)

Body Condition Scores: general considerations and caution

- Characteristic regions of fat deposition in camelids
 - Shoulders
 - Briskets
 - Cranial ribs
 - Inner thighs
 - Perineum

- Camel: Hump (or humps)

- ***Score 1: Emaciated (Figure 1)***

- Physically weak, Thin face and neck
- Extreme loss of muscle mass
- Absence of perineal fat, sharp visible ischial tuberosities (pin bones)
- Prominent tail-head
- Sharp, readily visible tuber coxae (hooks and hipbones)
- Prominent, sharp spinal processes and transverse processes
- Deep depression over the lumbar area
- Gaunt, visible, tucked-in paralumbar fossa
- Ribs easily identified from distance, depressed intercostal areas
- Hump: absent, straight backline



- **Score 2: Thin (Figure 2)**

- Minimal muscle mass
- Visible spine, pin bones and hip bones
- Lumbar fossa prominent
- Visible rib outlines
- No fat in brisket and sharp edges of the sternum
- Very small hump



- **Score 3: Moderately thin (Figure 3)**

- Minimal muscle mass
- Visible spine, pin bones and hip bones
- Lumbar area depression slightly filled in but easily palpable
- Gradual filling on the brisket and loss of sharp edges of the sternum
- Small hump



- **Score 4: Borderline thin (Figure 4)**

- No muscle atrophy
- Slightly visible spines, hipbones, pin bones
- Last ribs outlines
- Lumbar fossa not very evident
- Shoulder and rump muscles can still be delineated
- Hump slightly below normal size with angular dorsal edge



- **Score 5: Optimum (Figure 5a,b)**

- Normal muscle mass and smooth appearance
- Lumbar area depression palpable with slight pressure
- Lumbar fossa not evident
- Perineum filled in
- Pins and hooks are still visible
- Sternum palpable but starting to become round
- Ribs can still be palpated with some pressure
- Shoulder and rump muscles can still be delineated
- Hump normal size with angular dorsal edge



● **Score 6: Optimum (Figure 6)**

- Normal muscle mass and smooth appearance
- No visible spine and rib outline
- Slightly visible hip and pin bone
- Normal size brisket with some fat deposit
- Perineum filled in and patchy fat around tail-head
- Pins and hooks are still visible
- Ribs can still be palpated with some pressure
- Hump normal size



Score 7: Slightly fat (Figure 7)

- Normal muscle mass
- No visible spine and rib outline
- Slightly visible hip and pin bone
- Normal size brisket with full fat deposit
- Perineum filled in and fat around tail-head
- Some ribs can still be palpated with some pressure
- Hump slightly larger than normal



● **Score 8: Fat (Figures 8 and 9)**

- Musculature not well defined “buried in fat”
- Lumbar area rounded to nearly flat
- Pins and hooks are rounded but visible
- Perineum filled in, no depression under the tail
- Brisket well developed
- Ribs can only be palpated with firm pressure
- Shoulders very thick
- Hump round and wide at the base



- **Score 9: Obese**

- Smooth, rounded appearance due to excessive fat deposition
- Lumbar area completely rounded
- Bony structures difficult to palpate
- Thick tail-head
- Rounded fat brisket and thick shoulders
- Very large and round hump (s)

GENETICS

- There are several breeds of camels and it is very difficult to discern subtle variations in body type and their effect on scoring of the body condition
- Bactrian x dromedary crosses tend to have a very large, wide hump

CAUSES AND RISK FACTORS

- BCS score change with production cycle (lactation, breeding, pregnancy) and quality of nutritional program
- Males tend to lose body condition during the rutting season
- In non-supplemented nomadic herds there is a normal variation of body condition score of 3 to 4 points between the raining and dry season
- BCS changes occur due to various chronic illnesses, particularly trypanosomiasis and gastrointestinal parasitism
- Racing camels are often kept at a minimal body condition
- In North America and zoo the tendency is for animals to become very obese predisposing them to metabolic disorders and infertility. This due to overfeeding
- Bactrian camels undergoing severe nutritional and body condition changes may experience a drop of the hump ("Floppy humps") (Figure 10: ideal body condition, Figure 11: Obese male, Figure 12: male with floppy hump, Figure 13: Lactating female BCS of 1, floppy humps)



Figure 10



Figure 11



Figure 12



Figure 13



DIAGNOSIS

DIFFERENTIAL DIAGNOSIS

- Differential diagnosis of causes of weight loss include poor nutrition, poor dentition, heavy parasitism, trace mineral deficiencies

CBC/BIOCHEMISTRY/URINALYSIS

- Indicated if a systemic disease is suspected

OTHER LABORATORY TEST

- Parasitology
- Test for trypanosomiasis
- Test for Johne's diseases
- Trace mineral analysis
- Feed analysis

IMAGING

- Transabdominal ultrasonography if gastrointestinal disorders are suspected
- Radiography if dental or maxillary abnormalities are found

OTHER DIAGNOSTIC PROCEDURES

- Depend on suspected condition

PATHOLOGIC FINDINGS

- Animal with extreme variation in body weight may be affected by "floppy hump"
- Fat necrosis around the hump in obese animals



TREATMENT

THERAPEUTIC APPROACH

- In cases of weight loss: treat the underlying cause and rectify the nutritional program particularly in older animals
- In cases of obese animals. Reduce intake and promote exercise

SURGICAL CONSIDERATIONS AND TECHNIQUES

- N/A



MEDICATIONS

DRUGS OF CHOICE

- Depend on suspected cause of poor BCS

CONTRAINDICATIONS

- N/A

PRECAUTIONS

- Avoid fasting obese animals

POSSIBLE INTERACTIONS

- N/A

APPROPRIATE HEATHCARE

- Thin and obese animals should be closely monitored before breeding
- Diet should be slowly adjusted to meet the desired BCS

CLIENT EDUCATION

- Hand-on training in body condition scoring technique and use for management
- Distribution of BCS charts



FOLLOW-UP

EXPECTED COURSE AND PROGNOSIS

- Usually good prognosis if the underlying cause is determined and is treated promptly
- It is usually very difficult to reduce BCS in obese animal

POSSIBLE COMPLICATIONS

- Severe changes in BCS may result in metabolic disorders
- Very low and very high body condition scores may affect cyclicity and fertility in males and females

CLIENT EDUCATION

- Importance of observation of individual animals (particularly geriatric animals)
- Importance of a herd health program with parasite prevention
- Formulate ration based on feed testing and feeding guidelines
- Separate and feed animals based on BCS and physiological stage of production

PATIENT CARE

- N/A

PREVENTION

- Obesity is very rare in camels reared under normal pastoral/nomadic conditions but is very common under some lush conditions (zoological parks)
- Poor body condition is more common in nomadic herds particularly lactating females: strategic feed supplementation at critical times of the year help circumvent severe loss of BCS
- Deworming programs should be designed to reduce heavy parasitism in high risk seasons
- Ration should be adjusted for animals used for draught



MISCELLANEOUS

ASSOCIATED CONDITIONS

- Heavy parasite load is common in camels with poor body condition
- Fat necrosis (floppy hump) is often seen in Bactrian camels with great variations in body condition

AGE-RELATED FACTORS

- N/A

ZOONOTIC POTENTIAL

- N/A

PREGNANCY

- Pregnancy may affect body condition scoring.

BIOSECURITY

- N/A

PRODUCTION MANAGEMENT

- BCS should be assessed at least 4 times
- Best times for assessment of body conditions scores for the herd in general are

- Before cool /rainy season (breeding season)
- In the middle of cool /rainy season
- At the end of the rainy season
- Mid to late dry /arid season
- Best times for assessment of body conditions scores for breeding females are
 - Early pregnancy
 - Mid pregnancy
 - At parturition
 - 6 week after parturition (peak lactation)
 - At weaning
- The ideal BCS
 - Males: 6 to 7 before the breeding season. Males will lose up to 25% of their body weight during the breeding season. Camels in free mating systems may loose up to 2 points during rutting season.
 - Females: 2.5 to 3.25 for open or lactating females. 3.25 to 3.5 in the last trimester of pregnancy. Lactating females should not lose more than 0.5 to 0.75 points

SYNONYMS

- N/A

SEE ALSO

- Camelid Dentistry
- Camelid: Gastrointestinal Disease
- Camelid Parasitology
- Camelid: Reproduction
- Nutrition and Metabolic Disease: Camelid (www.fiveminutevet.com/ruminant)
- Parasite Control Programs: Camelid
- Trypanosomosis
- Weight loss: Camelid

ABBREVIATIONS

BCS= body condition score

SUGGESTED READING

Faye B, Bengoumi M, Messad S et al. Estimation des reserves corporelles chez le dromadaire. Revue Elev. Méd. Vét. Pays Trop. 2002, 55: 69-78

Shittu A, Zaharadeen MM, Fasina FO et al. Classification of slaughtred animals and estimation of body condition scores during rainy season in Sokoto abattoir. Sokoto Journal of Veterinary Sciences. 2014, 12: 31- 40

Tibary A. and Anouassi A. Management of reproduction in camelidae. In: Theriogenology in camelidae Actes Edition, Rabat, Morocco 1997. pp. 453- 479

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