

BODY CONDITION SCORING: ALPACAS AND LLAMAS



BASICS

OVERVIEW

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

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 allows monitoring animals through a change in feed or feeding systems.

INCIDENCE/PREVALENCE

- N/A

SYSTEMS AFFECTED

- Musculoskeletal, production management, nutritional, reproductive, lactation

PATHOPHYSIOLOGY

- Body adipose tissue reserves represent a good reflection on the state of energy balance of an animal
- Body size is variable between species of SAC and even within species because of the large variety of types or breeds
- Visual estimation of body weight is an important part of herd management and dosing of preventive medications (particularly anthelmintics, anesthetics and antibiotics)
- 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
- 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

GEOGRAPHIC DISTRIBUTION

- Worldwide

HISTORICAL FINDINGS

- Weight loss
- Weight gain

- Complaint of illthrift, gastrointestinal disorders

SIGNALMENT

- BCS should be determine on all animals regardless of age and sex.
- It is important to take into consideration to the type of animal examined (Suri vs. Huacaya in alpacas) and breed (llamas)
- It is important to consider whether the animal is in full fleece or shorn

PHYSICAL EXAMINATION FINDINGS

- Animal with poor body condition may have other physical abnormalities such as skin lesions, diarrhea, weakness
- It is important to palpate the animal for accurate appreciation of BCS
- Body areas to be Assessed:
 - The dorsal aspect of the thorax, just caudal to the withers
 - The fiberless area behind the elbows
 - The region between the hind legs
 - The brisket area
 - Palpation of the pelvis is less than ideal due to the inherent thin skin, light muscling, and minimal fat cover in this area
- Technique for evaluation (Figure 1)

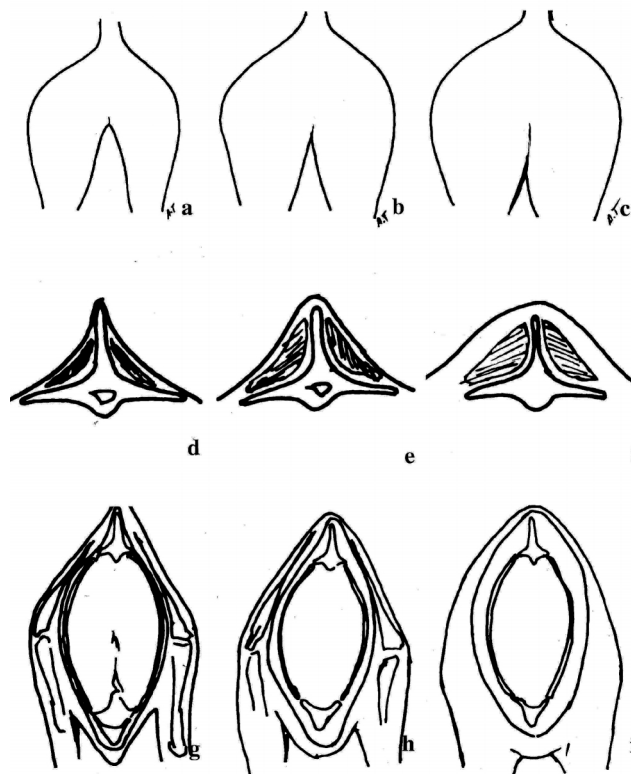


Figure 1: Body condition score evaluation in llamas and alpacas. a-c: Inspection of the space between the inner thighs (a: thin, b: optimal, c: obese); d-e: Inspection and palpation of the

lumbar area (d: very little muscle, e: optimal, f: fat); g-i: Conformation of the thoracic and sternal area(g:Thin, h: optimal i: obese).

- General appreciation from a distance for camels, camelids and if animals are sheared (llamoids)
- Depending on the body area, palpation evaluates fat deposit or both muscle mass and fat deposit
- Palpate over the lumbar (loin) areas to feel the spinous and transverse processes and evaluate presence or absence of depression and its depth or roundness. Evaluating the angle from between the thumb on one side of the spinous process and the other fingers on the other side. (Figures 2 and 3)



Figures 2 and 3: Palpation of the lumbar area in alpacas.

- Inspect and palpate the paralumbar fossa and evaluate the depth of the shelf created by the transverse process of the lumbar vertebrae
- Palpate over the ribs to feel the fat cover in that region
- Raise the tail and inspect the perineal area and the inguinal area for shape (curvature and fat deposition)
- Palpate the brisket for roundness and shape
- Palpate the shoulders for fat deposit
- In camels inspect the size and shape of the hump
- Scores are given from 1 (emaciated animals) to 5 or 9 (obese animals) depending on preference
 - Generally people using the 5 point system using intermediate scores in increments of 0.25 to 0.5 point
 - The ideal BCS
 - Males: 3 to 3.25 before the breeding season. Males will loose 0.5 to 1.0 points 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 loose more than 0.5 to 0.75 points
- ***Score 1: Emaciated animal (Figures 4, 5)***





Figures 4 and 5: Emaciated alpaca BCS 1.

- Extreme loss of muscle mass
- Thin face
- Deep depression over the lumbar area
- Gaunt, visible, tucked-in paralumbar fossa
- No perineal fat, sharp visible ischial tuberosities
- Inverted “V” inner thighs shape
- Narrow prominent “V” shaped brisket
- Ribs easily identified, depressed intercostal area
- **Score 2: Thin**
 - Muscle mass is minimal
 - Lumbar area depression slightly filled in but easily palpable
 - Lumbar fossa prominent
 - Some fat deposition in the perineal area
 - Gradual filling of the inner thighs
 - Gradual filling on the brisket and loss of sharp edges of the sternum
- **Score 3: Moderate (Figure 6)**
 - Normal muscle mass and smooth appearance
 - Lumbar area depression palpable with slight pressure
 - Lumbar fossa not evident
 - Perineum filled in
 - Inner thighs rounded
 - Brisket: sternum still palpable but starting to become round
 - Ribs can still be palpated with some pressure
- **Score 4: Fat**
 - Musculature not well defined “buried in fat”
 - Lumbar area rounded to nearly flat
 - No shelf formed by the transverse process of the lumbar vertebrae
 - Perineum filled in, no depression under the tail
 - Inguinal area filled in
 - Brisket flat
 - Ribs can only be palpated with firm pressure
- **Score 5: Obese (Figures 6, 7, 8, 9)**



Figure 6: Examples of emaciated (left) and optimal body condition (right) llamas.





Figures 7-9: Lateral, lumbar and shoulder views of an obese alpaca (BCS=5).

- Smooth, rounded appearance due to excessive fat deposition
- Lumbar area completely rounded
- Bony structures difficult to palpate
- Bulging perineum
- Thick tail-head
- Convex inguinal appearance
- Rounded brisket

GENETICS

- Species, breed and type of animal play a role in appreciation of BCC

CAUSES AND RISK FACTORS

- BCS score change with production cycle (lactation, breeding, pregnancy) and quality of nutritional program
- BCS changes occur due to various chronic illnesses
- In North America, open non-lactating females and males have a tendency to become obese



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 *Mycoplasma hemolamae* in cases of anemia
- BVD
- 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

- Depend on suspected condition



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



FOLLOW-UP

EXPECTED COURSE AND PROGNOSIS

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

POSSIBLE COMPLICATIONS

- Animals with poor BCS will have a compromised general health and immune system, increased risk for infertility and pregnancy loss
- Animal with very high BCS are predisposed to metabolic disorders

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

- Good nutrition and overall herd management



MISCELLANEOUS

ASSOCIATED CONDITIONS

- N/A

AGE-RELATED FACTOR

- N/A

ZOONOTIC POTENTIAL

- N/A

PREGNANCY

- Pregnancy and lactation have profound effects on BCS

BIOSECURITY

- N/A

PRODUCTION MANAGEMENT

- BCS should be performed on all animals within the herd on a minimum quarterly basis.

- BCS should be assessed at least 4 times and ideally 6 times a year
- Best times for assessment of body conditions scores for the herd in general are
 - Before winter
 - In the middle of winter
 - In spring
 - In summer
 - In fall
- Best times for assessment of body conditions scores for breeding females are
 - Early pregnancy
 - Mid pregnancy
 - At parturition
 - 6 week after parturition (corresponds in general with the early pregnancy in re-bred females)
 - At weaning (corresponds in general to mid pregnancy in re-bred females)

SYNONYM

- N/A

SEE ALSO

- Blood Chemistry (www.fiveminutevet.com/ruminant)
- Camelid: Dentistry
- Camelid: Parasitology
- Nutrition and Metabolic Disease: Camelid (www.fiveminutevet.com/ruminant)
- Parasite Control Programs: Camelid
- Physical Examination: Camelid (see Appendix 5)
- Vaccination Programs: Camelid
- Weight Loss: Camelid

ABBREVIATIONS

BCS= body condition score

SUGGESTED READING

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