

Body Condition Scoring of Captive (Zoo) Equids

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Obesity in captive wild equids may result from forage diets that are higher in energy, over-fed and not fed according to BW. In addition, processed forages are supplemented or substituted for long-stem forage diets and differences in feeding management are not considered. The scoring system used for domestic horses has been used and modified for captive (zoo) equids. The nine-point system provides a useful tool to objectively determine if an equid is too fat or too thin. The categories range from 1 (poor) to 9 (extremely fat) with 5 (moderate) representing the "ideal" body condition. Four anatomical areas are identified to visually assess zoo equids compared to the nine anatomical structures used for domestic horses. To identify visual differences in wild equids, keepers must first develop proficiency in existing scoring systems. Captive equids that lack adequate conditioning (1-4) will appear angular with bone structures visually discernable, including prominent thoracic and lumbar vertebrae, ribs, and points of hip & buttocks. Over-weight to obese equids will show more contour and less angularity. Ribs and vertebra are not visually discernible with scores ≥ 5 . Ass-type equids are more angular in the hips than the horse-type equids of comparable condition scores. They also have less fat along the neck and withers for comparable scores. The neck and shoulder of horse-type equids amplified the increases of fat deposition. Patches of fat can appear on the neck, shoulder and hip with scores greater than 7.

Key words: *Equus* spp., condition score, obesity

INTRODUCTION

Maintaining body weight of wild equids in captivity is an on-going challenge for animal care personnel. Although underweight and thin equids in captivity can occur, over-weight animals, including obesity, is usually the primary concern. The over-weight and obesity problems simply results from feeding more energy than they need but there are a number of factors that have or may contribute to this nutritional management concern.

1. Animals are usually maintained in small enclosures and are inactive;
2. enclosures usually do not provide the animals an opportunity to actively forage, and the acquisition of food has been eliminated as a survival issue;
3. rations are frequently meal fed (two-times/day) vs. continuous feeding such as grazing;
4. equids are housed in groups and the amounts of forages fed are usually not based on body weight, subsequently animals are frequently over-fed;
5. processed forages (pellets and cubes) are supplemented or substituted for long-stem forage diets and adjustments may not be considered for differences in consumption, orts and feeding management;
6. forages fed in captivity are for the most part higher in energy than those from their respective habitat;
7. food is used as a source of enrichment and enrichment feedstuffs may not be included in determining daily energy intakes; thus, equids may be overfed;
8. they are no longer engaged in migration patterns or fleeing from natural predators, thus less energy expenditure;

9. keepers experiences with production animals and experiences with body evaluation systems of animals (horses, cattle, dogs, cats, etc.) have not been common;
10. most keepers are not familiar with domestic horse scoring systems that provide an objective assessment of the amount of external fat of an equine animal and;
11. universal use of the body condition scoring system by equine veterinarians and specialists has been slow.

Condition scoring will provide animal keepers a useful tool to safely adjust diets for changes in body weight. Proper use of a system evaluating body conditioning will also provide an opportunity to improve nutritional management of wild equids maintained in captivity.

MATERIALS AND METHODS

The scoring system developed for domestic horses (Henneke, et al., 1983; NRC, 1989) was used as a guide to evaluate wild equids in captivity at two facilities. The nine-point scoring system provides a useful tool to objectively determine if an animal is too fat, too thin or ideal. The categories range from 1 (poor) to 9 (extremely fat) with 5 (moderate) representing the "ideal" body condition.

Przewalski's horse (*Equus przewalskii*), Grevy's zebra (*Equus grevyi*), eastern kiang (*Equus kiang holdereri*) and Somalia wild ass (*Equus africanus somalicus*) were evaluated for overall body condition relative to visual assessment of external body fat. Although this scoring system was developed with stock-type mares, the system has become a useful tool for equine professionals in providing a guide and consistency in the evaluation of all domestic equids, including light-horses, draft-horses, mules, and asses. Differences in scoring ass-type equids were considered in the evaluation as noted by Bray (1999). When wild equids were immobilized for health or management reasons, the opportunity was used to palpate the animal for external body fat and compare the visual inspection with the palpation inspection. The body condition scoring was conducted by one evaluator who has 14 years of experiences in using the body condition scoring system with domestic equids.

RESULTS

Four general anatomical areas were identified to visually access wild equids compared to the nine anatomical structures used with domestic horses. The anatomical areas for wild equids included the 1) areas of neck, shoulder and withers 2) back and loin 3) areas around the tail-head and hip (including the points of buttock and hip) 4) rib area. The scoring system used for domestic horses was modified with the observations from the evaluation of wild equids and is listed in Table 1. Observations of domestic horses for the respective scores are also included in the table for comparison to the observations made for the captive (zoo) equids. Captive equids that lack adequate conditioning (1-4) will appear angular with their bone structures visually discernable, including prominent thoracic and lumbar vertebrae, ribs, and points of hip and buttocks. As specified with the domestic horse system, the more prominent the bone structures and angularity, the lower the score. Over-weight to obese equids will show more contour and less angularity. Ribs and vertebra are not visually discernible with scores ≥ 5 . Ass-type equids are more angular in the hips than the horse-type equids of comparable condition scores. They have less fat deposits along

the neck and withers for comparable condition scores. The neck and shoulder of horse-type equids amplified the increase of fat deposits or conditioning. Patches of fat can appear on the neck, shoulder and hip with scores greater than 7. As the conditioning (or fatness) increased, the width and thickness of the fat wrinkles along the neck shoulder and ribs also increased. Equids with scores of ≥ 7 , demonstrated noticeable thickening of the neck. As the animal becomes fatter (higher scores), the bend at the neck will demonstrate fewer but wider fat wrinkles over the neck and shoulder area.

DISCUSSION

In order to identify visual differences in wild equids, keepers must first develop proficiency in the scoring system developed at Texas A & M University that has also been published in the National Research Council's 1989 edition of the *Nutrient Requirement of Horses*. The genetic differences among wild equids are diverse and can provide difficulties for generalities since palpation is only available if the animal is immobilized. Wild equids are generally smaller than their domestic counter species, but there are similarities with the order and degree of fat deposition as the animal gains or loses conditioning. As expected, thin animals demonstrated angularity and fleshly animals were more contour and rounded in appearance. In the domestic horse industry, emphasis of fat over the ribs has been the primary criterion for evaluating overall conditioning. Keepers also practice this single evaluation criterion. Both groups have confused the presents of unevenly spaced fat wrinkles in the rib area with the rib structures with condition scores that would approximate between 5 and 6.

Keepers, like horse owners, must be able to accurately assess equid's body condition in order to begin establishing a satisfactory feeding program. Although opportunities to use palpation as a tool in assessing zoo equids will be minimal at best, developing skills in visual inspection is critical. Keepers can develop proficiency with scoring domestic horses by attending equine workshops or extension programs that provide instruction. Zoo veterinarians, nutritionists and animal care personnel that have a foundation of a numerical scoring system will also share a common language to communicate information to each other relative to the animal's general and nutritional health. Efforts to improve these initial observations and scoring guide of captive (zoo) equids are on going.

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TABLE 1. Comparison of body condition scoring for domestic & captive (zoo) equids

Score	Neck & Shoulder	Withers	Loin & Back	Tailhead & Hip	Ribs
Domestic 1 Poor Captive (Zoo) Equids	Bone structures easily discernible; emaciated; no fatty tissue can be felt	Easily discernible; emaciated; no fatty tissue can be felt	Spinous processes projects prominently; emaciated; no fatty tissue can be felt	Hooks & pins project prominently	Project prominently
	<i>Bone structures easily discernible; emaciated; fatty tissue will not be felt or observed</i>		<i>Spinous processes projects prominently; emaciated; no fatty tissue is evident</i>	<i>Hooks & pins project prominently</i>	<i>Project prominently; rib spacing appears wide & depressed</i>
Domestic 2 Very Thin Captive (Zoo) Equids	Bone structures faintly discernible; visually evident; animal emaciated	Faintly discernible; visually evident; animal emaciated	Slight fat over base of spinous processes but still prominent; transverse processes of lumbar vertebrae feel rounded	Prominent & visually evident	Prominent & visually evident
	<i>Bone structure of withers still evident; not as pronounced as domestic; animal still appears visually emaciated</i>		<i>Spinous processes still prominent; transverse processes of lumbar vertebrae evident</i>	<i>Hooks & pins are prominent & visually evident</i>	<i>Still prominent & visually discernible</i>
Domestic 3 Thin Captive (Zoo) Equids	Structures accentuated	Structure accentuated	Fat buildup on spinous processes but easily seen; transverse processes can not be felt; Slope appearance from distal spinous processes; referred to as an inverted crease	Prominent, but individual vertebrae cannot be identified visually; hooks appear rounded but still easily discernible; pins not discernible	Slight fat cover over ribs; easily discernible
	<i>Withers less emphasized; neck continues to appear disjointed with neck, perhaps more so with ass-type equids; ventral portion of neck appears thicker than dorsal portion</i>		<i>Prominent, but individual vertebrae may not be identified visually; fat on spinous processes; transverse processes faintly discernible; inverted crease along back</i>	<i>Hooks appear rounded but still easily seen; pins may be discernible</i>	<i>Slight fat cover over ribs but remain easily discernible</i>

<p>Domestic</p> <p>4</p> <p>Moderately Thin</p> <p>Captive (Zoo) Equids</p>	Structures not obviously thin	Not obviously thin	Slope appearance from distal spinous processes; referred to as an inverted crease	Prominence depends on conformation; fat felt; hooks not discernible	Faint outline discernible
	<i>Thin but not obviously thin; will appear thinner with ass-type equids compared to horse-type; e.g Przewalski; ass-type equids are angular in appearance</i>		<i>May have a slight inverted crease along back</i>	<i>Prominence depends on whether ass-type or horse-type; hooks not discernible; sides of hip are flat</i>	<i>Faint outline; may be seen; horse-type equids appear to have more fat over ribs</i>

Continue - Body condition scoring for domestic & captive (zoo) equids

Score	Neck & Shoulder	Withers	Loin & Back	Tailhead & Hip	Ribs
<p>Domestic</p> <p>5</p> <p>Moderate</p> <p><i>Captive (Zoo) Equids</i></p>	Blends smoothly into body	Rounded over spinous processes	Back level	Fat around area beginning to feel spongy	Not visually discernible but easily felt
	<i>Shoulder will appear to blend into body; for ass-type neck may still appear thin & not blend into body; for zebras & Przewalskis neck is thicker & may appear slightly fleshy compared to domestic equids; wither appears flat</i>		<i>Back appears level; ass-type will appear angular compared to lower condition scores</i>	<i>Tailhead is not prominent; fat around area; sides of hip still appear flat</i>	<i>Ribs not visible but if accessible, could be easily felt; horse-type equids appear to have more fat over ribs</i>
<p>Domestic</p> <p>6</p> <p>Moderately Fleshy</p> <p><i>Captive (Zoo) Equids</i></p>	Fat deposits beginning in areas	Fat beginning to be deposited	May have slight crease down back	Fat around area feels soft	Fat over area feels spongy
	<i>Fat beginning to be deposited; neck appears thicker, particularly for horse-type; smoother transition of neck into body</i>		<i>Back appears level but wider; ass-type still appear slightly angular over back</i>	<i>Distinguish additional fat at the junction of the tailhead & sacral vertebrae; if immobilized, fat around area feels soft; hip & thigh appear less flat</i>	<i>Ribs not discernible</i>
<p>Domestic</p> <p>7</p> <p>Fleshy</p> <p><i>Captive (Zoo) Equids</i></p>	Fat deposited along areas	Fat deposited along area	May have crease down back ("gutter" appearance); appearance influenced by breed	Fat around area is soft	Can feel individual ribs; fat between ribs obvious
	<i>Fat deposited along area is evident; bend of neck demonstrates wider fat wrinkles over neck & shoulder areas</i>		<i>Back may appear level; may not demonstrate crease used to describe domestic equids; has fat patches</i>	<i>Hip & thigh appear slightly round</i>	<i>Thickening over ribs is evident; fat wrinkles over ribs are uneven spacing & wide</i>
<p>Domestic</p> <p>8</p> <p>Fat</p> <p><i>Captive (Zoo) Equids</i></p>	Noticeable thickening of neck Area behind shoulder filled-in & flushed with body	Area along withers filled with fat; may appear patchy	Crease ("gutter" appearance) down back is evident	Fat around area feels very soft	Difficult to feel ribs

	<i>Noticeable more thickening of neck; bend of neck demonstrates fewer & wider fat wrinkles over shoulder & withers; withers not definable for horse-type; may have patchy fat</i>		<i>Back does demonstrate obviously crease; patchy fat can be seen</i>	<i>Hip & thigh appear round</i>	<i>Fat provides a wider wrinkling effect that are exaggerated on bends</i>
Domestic 9 Extremely Fat Captive (Zoo) Equids	Bulging fat	Bulging fat	Obvious crease down back	Bulging fat around area	Patchy fat may appear over area
	<i>Fat is evident along neck; withers not identifiable; fat patches are evident</i>		<i>Patchy fat, back wide</i>	<i>Hip & thigh are obviously round</i>	<i>Patchy fat may appear over area; fat evident</i>