

## Further Honing of Body Condition Scoring Scales for Cheetahs (*Acinonyx jubatus*)

Mike Maslanka, MS, and Adrienne Crosier, PhD

Department of Nutrition Science, Smithsonian National Zoological Park and Conservation Biology Institute, Washington DC; AZA Cheetah SSP Program Leader, Center for Species Survival, Smithsonian National Zoological Park and Conservation Biology Institute, Front Royal, VA.

### Abstract

Body condition Scoring (BCS) is a non-invasive, cost-free tool to evaluate the extent of external (subcutaneous) adipose tissue on the skeletal structure of an animal. A five point scale was initially developed for cheetahs in 2007 (Dierenfeld et al). In 2011, Reppert, et al began the transition of the BCS scales for cheetahs to a 9 point scale (scores 2/3 and 7/8 were each grouped together). This work further hones that scale to delineate 9 distinct scores in a common format with associated images and descriptions. Images were gathered from a variety of sources; however, appropriate pictures (correct aspect, angle, shading, etc) could not be assigned across all 9 condition scores, and the description stands alone for one score. We fully expect these scales to be refined further as we gather additional information and find the best image for each score (it is a living document). We hope that facilities managing cheetahs will employ this document to enhance the nutritional welfare (weight, condition, diet) of the animals in their care.

**Acknowledgements:** While these scales were primarily developed in this form at the Smithsonian National Zoological Park and Conservation Biology Institute with great help from the Nutritional Services team at the Fort Worth Zoo, the images and foundational information come from a variety of sources. The two primary sources are listed in the Literature Cited, while others exist at large in the Breeding Centers Coalition (BCC), Cheetah Sustainability Program (CSP), and the Species Survival Plan (SSP). We appreciate the contributions of all of our colleagues to the development of this living document. In addition, we also especially appreciate the hands-on feedback provided by the participants of the annual cheetah SSP meeting at Fossil Rim Wildlife Center in October 2017 where these were first introduced and employed.

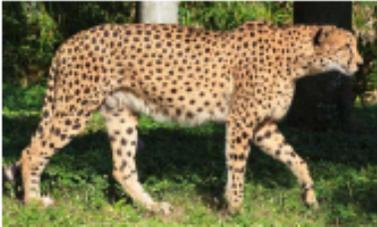
### Literature Cited

Dierenfeld, E., L. Fuller, and K. Meeks. 2007. Development of a Standardized Body Condition Score for Cheetahs (*Acinonyx jubatus*). Extended Abstract. In Proc 7<sup>th</sup> NAG Conf on Zoo and Wildlife Nutrition (Ward, A., A. Hunt, and M. Maslanka, eds), Knoxville, TN (Pp 202-204)

Reppert, A., K. Treiber, and A. Ward. 2011. Body Condition Scoring in Cheetah (*Acinonyx jubatus*): Advancements in Methodology and Visual Tools for Assessment. In Proc 9<sup>th</sup> NAG Conf on Zoo and Wildlife Nutrition (Ward, A., A. Coslik, and M. Maslanka, eds), Kansas City, MO (Pp 40-48).

	BCS	Neck / Shoulder	Torso / Ribs	Topline / Lumbar / Tuck	Hips / Buttocks/ Tailhead
NO IMAGE AVAILABLE	<b>1</b> Extreme low	<ul style="list-style-type: none"> <li>- Neck vertebrae visible</li> <li>- Ridge of shoulder blade sharply visible</li> </ul>	<ul style="list-style-type: none"> <li>- Ribs visible</li> <li>- Sharp transition between neck / shoulder and torso</li> </ul>	<ul style="list-style-type: none"> <li>- Vertebrae visible</li> <li>- Individual lumbar vertebrae visible</li> <li>- Severe tuck</li> </ul>	<ul style="list-style-type: none"> <li>- Point of hips sharp</li> <li>- Point of buttocks sharp</li> <li>- Bones in tail may be visible</li> <li>- Hip angle line concave</li> </ul>
	<b>2</b> Very low	<ul style="list-style-type: none"> <li>- Minimal coverage over neck vertebrae</li> <li>- Ridge of shoulder visible but slightly covered</li> </ul>	<ul style="list-style-type: none"> <li>- Ribs visible</li> <li>- Shoulder does not flow smoothly to torso, angular transition</li> </ul>	<ul style="list-style-type: none"> <li>- Vertebrae along topline visible</li> <li>- Outline of lumbar vertebrae visible</li> <li>- Obvious tuck</li> </ul>	<ul style="list-style-type: none"> <li>- Point of hips with minimal coverage</li> <li>- Point of buttocks angular with minimal coverage</li> <li>- Hip angle line concave</li> </ul>
	<b>3</b> Low	<ul style="list-style-type: none"> <li>- Shoulder blade visible, ridge begins to disappear</li> </ul>	<ul style="list-style-type: none"> <li>- Ribs barely visible / shadowed</li> <li>- Shoulder does not flow smoothly to torso</li> <li>- Torso shape still narrow, flattened</li> </ul>	<ul style="list-style-type: none"> <li>- Vertebrae along topline visible</li> <li>- Lumbar vertebrae individually visible with rounding dorsally, slight rounding of skin falling from tips</li> </ul>	<ul style="list-style-type: none"> <li>- Point of hips and point of buttocks with slightly round heads</li> <li>- Hip angle concave to flat</li> <li>- Tailhead protrudes with depressions both sides</li> </ul>
	<b>4</b> Moderately low	<ul style="list-style-type: none"> <li>- Shoulder blade visible, no ridge apparent</li> </ul>	<ul style="list-style-type: none"> <li>- Ribs not visible</li> <li>- Torso shape starting to round</li> <li>- Shoulder transition to torso distinct but smoother</li> </ul>	<ul style="list-style-type: none"> <li>- Topline mildly covered</li> <li>- Lumbar vertebrae visible but starting to look like a set</li> </ul>	<ul style="list-style-type: none"> <li>- Points of hips and buttocks slightly visible, beginning to round</li> <li>- Hip angle flattening</li> <li>- Tailhead visible but blending into hip at tail base</li> </ul>
	<b>5</b> Moderate	<ul style="list-style-type: none"> <li>- Shoulder blade flat but no ridge</li> </ul>	<ul style="list-style-type: none"> <li>- Shape of torso just apparent, starting to round</li> <li>- Shoulder flows smoothly into torso</li> </ul>	<ul style="list-style-type: none"> <li>- Topline moderately covered, flatter in appearance</li> <li>- Lumbar vertebrae not visible, obvious rounding</li> </ul>	<ul style="list-style-type: none"> <li>- Point of hips and buttocks rounded</li> <li>- Tailhead may be slightly visible</li> </ul>

BCS	Neck / Shoulder	Torso / Ribs	Topline / Lumbar / Tuck	Hips / Buttocks/ Tailhead
-----	-----------------	--------------	-------------------------	---------------------------

	BCS	Neck / Shoulder	Torso / Ribs	Topline / Lumbar / Tuck	Hips / Buttocks/ Tailhead
	<b>5</b> Moderate	- Shoulder blade flat but no ridge	- Shape of torso just apparent, starting to round - Shoulder flows smoothly into torso	- Topline moderately covered, flatter in appearance - Lumbar vertebrae not visible, obvious rounding	- Point of hips and buttocks rounded - Tailhead may be slightly visible
	<b>6</b> Moderately high	- Shoulder blade beginning to round	- Shape of torso disappearing - Almost smooth transition between shoulder and torso	- Topline smooth, almost flat in appearance - Lumbar vertebrae round - Tuck weakening	- Point of hips almost disappeared (flat across top) - Tailhead barely visible, blends into rump
	<b>7</b> High	- Shoulder blade rounded and starting to disappear into neck and torso	- Torso rounded in appearance - Full body almost completely blended together - Weak tuck, if any	- Topline flat in appearance - Lumbar region blends with points of hips across top	- No points of hips apparent - Tailhead blends with rump, no ridge
	<b>8</b> Very high	- Shoulder round and blends into chest - Chest prominent, obvious tissue deposition between front legs	- Torso barrel-shaped - Lower torso begins to round below the ribs - No tuck	- Topline flat, possibly rounded over shoulders and lumbar region	- Hip and buttocks not visible. - Tailhead not visible, blends with rump, may be lower than surrounding tissue - Tail base thickening
	<b>9</b> Extremely high	- Chest full, bulging in appearance - Neck rounded - Shoulders bulging behind and on top	- Torso bulging, no distinction between body sections - Abdomen rounded, pendulous fat between hind legs	- Topline has a flat, table-like appearance - Lack of definition throughout body	- Hips, buttocks, tailhead, rump completely round, bulging in appearance - Thickened tail base
	<b>BCS</b>	<b>Neck / Shoulder</b>	<b>Torso / Ribs</b>	<b>Topline / Lumbar / Tuck</b>	<b>Hips / Buttocks/ Tailhead</b>