

BODY CONDITION SCORING INDEX FOR FEMALE AFRICAN ELEPHANTS (*LOXODONTA AFRICANA*) VALIDATED WITH ULTRASOUND MEASUREMENTS OF SUBCUTANEOUS FAT

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Abstract

A major problem of zoo African elephants is ovarian acyclicity, which preliminary studies suggest may be related to obesity. To test this relationship, methods to accurately quantify body condition and obesity in elephants are warranted. Body condition scoring (BCS), an indirect means of measuring body condition based on visual evaluation of subcutaneous fat and key skeletal elements, has become an integral part of assessing body fat in a variety of species as an effective and inexpensive method for quantifying condition. The objective of this study was to develop a BCS index for female African elephants and validate the index with ultrasound measures of subcutaneous fat. The new visual elephant BCS index consists of a list of body regions and the physical criteria for assigning a numerical score (1-5 point scale) indicative of body fat, and includes example photographs of elephants representing each BCS. Ultrasound measures of subcutaneous fat showed that as the BCS increased, the amount of fat also increased ($P < 0.05$). The new BCS system was tested for reliability in a trial consisting of 3 assessors, and intra- and inter-assessor reliability ranged from 75-95%, indicating excellent levels of agreement. Furthermore, BCS was correlated ($P < 0.05$) with reproductive cycling status, indicating body condition does play a role in ovarian acyclicity. Because of the increased role for BCS in elephant management and potential implications of management decisions based on BCS, this validated and reliable method of body condition scoring will be a valuable tool to those caring for elephants.