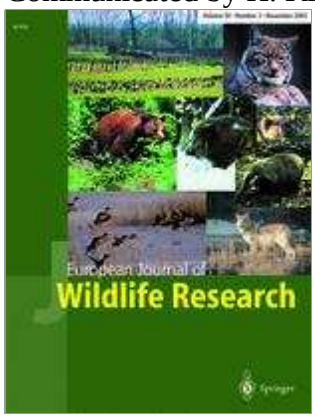
European Journal of Wildlife Research
October 2008, Volume 54, Issue 4, pp 675-680

A half a century of measuring ungulate body condition using indices: is it time for a change?

Abstract

From a literature review of five wildlife ecology journals since 1937, we document how using indices to monitor ungulate body condition is common practice, with the kidney fat index (KFI = weight of fat around the kidneys/weight of kidneys without fat × 100) as the favoured tool (82% of studies). In this context, we highlight the problems of using indices when underlying statistical assumptions are not met (isometry, parallel slopes between treatments). We show, with real and simulated data for two cervids with contrasting fat storage strategies, how results from analysis of variance of KFI values differ from analysis of covariance (ANCOVA) of raw data. We conclude that the KFI is affected by the restrictions typically associated with derived index values, and as a consequence, statistical analysis of the KFI could generate spurious results leading to erroneous interpretations concerning variation in body condition of ungulate populations. Thus, we recommend analysing fat weight as an untransformed variable in ANCOVA (kidney weight as covariate) to describe body condition variation in ungulates.

Communicated by H. Kierdorf



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References (24)

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Title
A half a century of measuring ungulate body condition using indices: is it time for a change?
Journal
European Journal of Wildlife Research
Volume 54, Issue 4 , pp 675-680
Cover Date
2008-10-01
DOI
10.1007/s10344-008-0194-7
Print ISSN
1612-4642
Online ISSN
1439-0574
Publisher
Springer-Verlag
Additional Links

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Topics

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- Zoology

Keywords

- ANCOVA
- Capreolus capreolus
- Dama dama
- Kidney fat index
- Ratios
- Residuals
- Proportions

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