

XI. HOW TO DETERMINE THE CONDITION OF LARGE HERBIVORES: DISCUSSION

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What is condition?

After the initial confusion about how to define the concept of condition, the following definition was generally accepted: the condition of an individual animal is the extent to which this creature can cope with a number of negative environmental factors, e.g. insufficient food supply and diseases and/or infection by parasites, which can be related to nutritional and physiological condition, respectively. This definition always applies to a relatively short period, e.g. the winter or a dry season.

Within this concept the workshop participants agreed that condition could also be defined as short-term (i.e., a few years) reproductive capacity. These three types of condition are related in the sense that in a healthy animal there is a substantial overlap and that if the condition declines, the different types perhaps decline at different rates, reproductive capacity being the last to be affected. In research papers it is advisable to specify which type of condition is concerned.

Condition indicators

One problem remains: the choice of parameters that can be used to establish condition objectively at the level of the individual in both live and dead animals.

Body weight and relative weight

The body weight, although used very frequently, is generally not considered to be a very good measure, and should always include some other quality, such as sex, age, or geographical position of the habitat. If the relative weight is taken as indicator for body condition, the body weight is related to the body frame, e.g. body length, leg length, or girth. This yields indices such as body weight/total length. This measure of fleshiness can of course be applied to both dead and live animals.

Some authors use condition scores, for example on the basis of a 1-to-5 scale derived from e.g. the pelvic curve for ponies or buffalo;

the workshop agreed that this can be done when large numbers of animals of one species present themselves to the field worker almost simultaneously. Unfortunately, this is rarely the case for red deer.

Fat indices

When dealing with dead animals, it is necessary to take into account the body's fat reserves, which might be indicative of other reserves as well. Wolkers remarked that unfortunately it does not seem possible yet to use the 'impedance meter' on hairy animals.

It was generally agreed that the reliability of the kidney-fat index as an indicator of body condition is usually overestimated due to the marked bias inherent in the sampling method and to the seasonal fluctuations of the weight of this organ, which are not correlated with the changes in total body weight.

Blood parameters

The workshop participants and the speaker disagreed about the validity of the blood-glucose parameter as a condition indicator, because of the strong dependence on stress. Unlike the speaker, the workshop was not convinced that this drawback can be overcome by sampling the blood immediately after the animal has been caught or culled.

With respect to blood urea, the speaker thought that this parameter could be a reliable indicator of the breakdown of muscle tissue in ruminants; for non-ruminants it would reflect food quality. However, Kirkpatrick et al. (1975) found a relationship between urea and food quality in ruminants too.

When asked by the participants which parameters should be measured, in a sequence of decreasing priority, to establish the condition of an animal, the speaker mentioned the glycogen and fat reserves of the liver, the blood-glucose level, and the blood concentrations of triglycerides, alkaline phosphatase, and albumin. The validity of this priority sequence was questioned by the workshop, because of the daily fluctuations and stress dependence of the liver glycogen reserves.

Minerals

Most minerals are buffered in the blood and are therefore of little practical value as condition indicators. The workshop underlined the relevance of determination of the mineral concentrations in the organs

because of the correlation with body functions, e.g. a shortage of copper in relation to anaemia. The workshop concluded that there is an urgent need for investigation of not only the normal but also of the critical values of some minerals in both the organs and the food supply.

There is, however, a real risk that the wildlife ecologist could become involved in very costly and laborious physiological research. Great appreciation of the work done by the speaker was expressed and its importance repeatedly emphasized.

Reference

Kirkpatrick, R.L. et al. 1975. Energy and protein influences on blood urea nitrogen of white-tailed deer fawns. Journ. Wildl. Mgmt. 39, 4: 692-698.



One of the major problems in the assessment of mortality in a population is caused by the difficulty of finding the dead animals.