

## Comparison of methods used to predict the *in vivo* digestibility of feeds in ruminants

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### Abstract

Digestibility is a very useful index of the energy content of ruminant feeds, but cheaper and quicker laboratory methods are required as an alternative to the ultimate measure of *in vivo* digestibility using animals. These methods involve either prediction of digestibility from chemical composition or *in vitro* and *in situ* simulation of the digestion process. This review presents a range of chemical and *in vitro* techniques for predicting digestibility, together with an assessment of their advantages and limitations, particularly the degree to which they account for the sources of variation in *in vivo* digestibility in ruminants. *In situ* digestion of feed samples in the actual rumen environment is probably the most accurate of the non *in vivo* procedures, but is not suitable for routine application. The *in vitro* gas production technique offers no advantages in prediction of total tract digestibility, but is useful for screening cereal grains for rate of starch hydrolysis in the rumen. The preferred procedure for routine laboratory prediction of digestibility is the pepsin-cellulase technique, provided amylase is included or high temperature digestion is used for samples high in starch content. Prediction of digestibility from chemical composition is not recommended. The optical technique of near infrared reflectance spectroscopy can be calibrated against any of the methods outlined in this review, and is unsurpassed in terms of speed and repeatability. Direct NIR prediction of *in vivo* digestibility is also possible, but is limited by the lack of adequate numbers of feed samples with known *in vivo* values. Future work should be aimed at filling this gap and also improving the accuracy of laboratory methods for predicting the digestibility of low quality feeds.

### Full Text

<http://www.publish.csiro.au/nid/40/paper/AR98169.htm>