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Empirical Validation of Applied Forage Models

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Abstract

Forage production models, together with forage budgets, can serve as an important decision support tool for farmers. In extensive grazing situations the estimation of the stocking-rate is one of the most important uses of forage budgets. A precise estimation of the adequate stocking-rate depends on the accuracy of the estimations of forage availability and forage allowance. The objective of this work is to present a method which evaluates the accuracy of forage models.Variables affecting the accuracy of the estimations of the stocking rate but not included in the forage model are assumed that belong to the decision-making context.

In the proposed method, the usefulness of the forage model is expressed by the probability that it drives the decision-maker to adopt the same stocking rate adopted with real forage availability. This method assumes that it is not necessary that the forage model predicts exactly the real forage availability, and that there is a range of values leading to the same decision. This range is defined by the maximum admissible error (MAE). The MAE adopts the highest of four sources of error: **(1)** demand model error; **(2)** estimation error; **(3)** continuity error; and **(4)** inflexibility error. MAE value depends on both the decision-making context and the sampling procedures. The observed means (Obs) follow a t-distribution. The area under the density function curve within the range estimated mean (Est)$\pm^{MAE}/_{2}$ is the probability that the model leads to adopt a stocking rate equal to the one adopted with the real forage availability.

Averaging the probabilities of all the Est-Obs pairs gives the overall probability that the model leads to adopt the same stocking rate adopted with real forage availability (P) given a certain decision-making context.

This method allows validate models stressing their intended use. Users of the forage model, i.e. decision-makers, can easily understand results of the proposed method.

Keywords: Applied models, decision-making, empirical validation, forage models

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