Using Digestible Fiber to Determine Forage Quality

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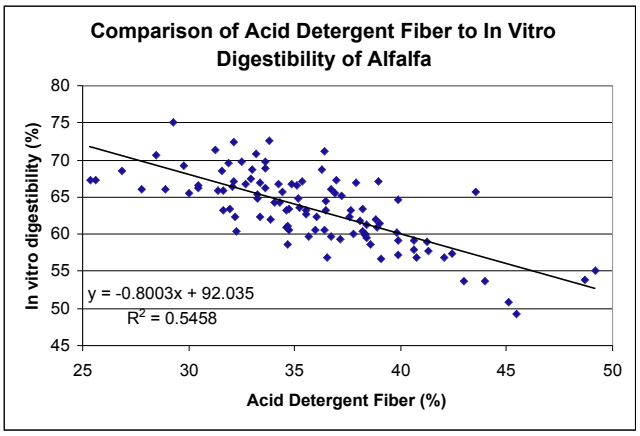
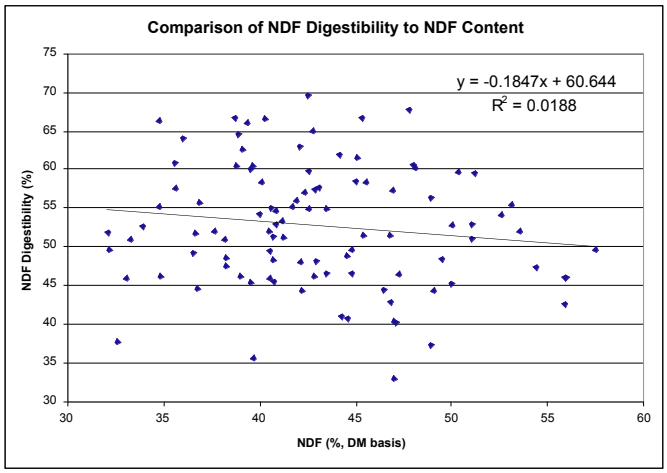
Acid detergent fiber (ADF) has been used to estimate digestible dry matter (DDM) for the last 25 years even though it was never designed for this purpose. When using any fiber determination to estimate digestibility the assumption is made that there is a close relationship between fiber concentration and digestibility. This is definitely not true as reported previously (Moore et al., 1998) and as shown in the graph at the left where the correlation between acid detergent fiber and in vitro digestibility among a data set of alfalfa and alfalfa/grass samples was only 0.55. Acid detergent fiber developed as a preparatory step for lignin analysis and was never intended for any other use.



While in vitro and in situ estimates of digestibility have long been recognized as being more closely related to animal performance than chemical extractions, this procedure has not been used commercially because of the expense and lack of access to a fistulated animal. The procedure is also difficult to get repeatability across runs and across different laboratories (Weiss, 1994.) A number of laboratories and researchers have attempted to use enzymatic methods to estimate digestibility. While these techniques have produced acceptable rankings within a forage species, the enzymatic techniques do not produce acceptable correlations with in vivo or in vitro digestibility over a broad range of forage samples.



Digestible fiber is an important component of forage energy and intake and is quite variable. Note from the graph at the right that there is even less relationship between NDF and digestible NDF, DM basis (dNDF) than there is between ADF and in vitro digestibility for a group of alfalfa and alfalfa/grass received by laboratories from farmers. We have developed Near Infrared Reflectance Spectroscopy equations for commercial release that measure digestible fiber.In summary, producers using forage analysis to balance rations have often been disappointed that the performance of cows did not match expectations. This uncertainty of results had led to, in some instances, minimizing forage in animal rations. This new analysis, when used with other current analysis gives more accurate estimates of animal performance on forages.

References

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