In Vitro NDF Digestibility to Evaluate Forage Quality

Importance of NDFd

NDF digestibility can be defined as a measure of the digestion coefficient for NDF. The NDFd content of a forage can have a large impact on the energy value of the diet and for this reason forages and mixed rations should be evaluated for NDFd. Increased NDFd will result in higher energy values. NDFd gives us more accurate estimates of TDN, NE and intake potential.

Different from other ruminants high producing lactating dairy cows have high energy requirements and diets low in NDFd have the potential to limit energy intake. It has been demonstrated that cows eat more and produce more milk when forages with higher NDFd levels are fed. A one unit increase in \textit{in vitro} forage NDFd corresponds to a 0.37 lb/day increase in dry matter intake and a 0.55 lb/day increase in 4% fat corrected milk yield (Oba and Allen, 1999). Therefore, significant advantages in feed formulation can be gained by knowing the NDFd of forages. When forages are high in NDFd lactating dairy cows will consume more forage of higher energy content producing more milk.

By measuring fibre digestibility, ration balancing is more precise, with more predictable animal performance. It also gives us the tools to better compare different forages.

Factors Affecting NDFd

NDFd can vary significantly due to forage species, maturity, genetics and environmental conditions.

Although legumes tend to have lower NDF levels than grasses, the NDFd of legumes tends to be lower than that of grasses. Legumes have a greater degree of lignification compared to grasses. This may explain why we often see cows producing more milk on grasses than we would expect. The range of NDFd in grasses is greater than that found in legumes or corn silage because of the extreme range in conditions under which grasses are often harvested. Corn silage, which is generally harvested within a narrow range of maturity, has a narrower range of NDFd.

Maturity and harvest time has a large impact both on %NDF and NDFd. Maturity increases NDF and decreases NDFd. As a plant matures, it deposits more of its tissue as lignin to provide structural support. Increased lignin levels lead to decreased fibre digestibility. Fibre digestibility is also influenced by plant genetics and selection programs.

Environment plays a big role in determining NDFd. Plants grown in cooler temperatures (eg. spring vs. summer growth) and at a more northern latitude have higher NDFd than plants grown in hotter temperatures.
Why test for NDFd?

NDF digestibility has a large impact on the energy value of the diet. The more NDFd in a forage, the more TDN content which impacts milk production.

There are three reasons why forages and total mixed rations must be evaluated for NDFd:

a. NDFd is required in summative equations to estimate energy content of forages. By measuring fibre digestibility, ration balancing is more precise, with more predictable animal performance.

b. NDFd allows us to better compare different forages and identify those with greater potential to increase intake and milk production.

c. The *in vitro* NDFd analysis provides information to make good decisions in nutritional management, and improves the profitability of dairy operations.


**In vitro NDFd Analytical Packages**

The time points available for analysis are 24, 30, or 48 hours. *In vitro* NDFd analysis must be run with a package or NDF as an option.

- 1 Time Point................................................. $45.00
- 2 Time Points................................................. $75.00
- 3 Time Points................................................. $95.00

- Samples requesting *in vitro* digestibility need to be at the lab by Monday at 4pm to be analyzed that week.
- Each sample is run in duplicate using rumen fluid from 2 lactating cows.