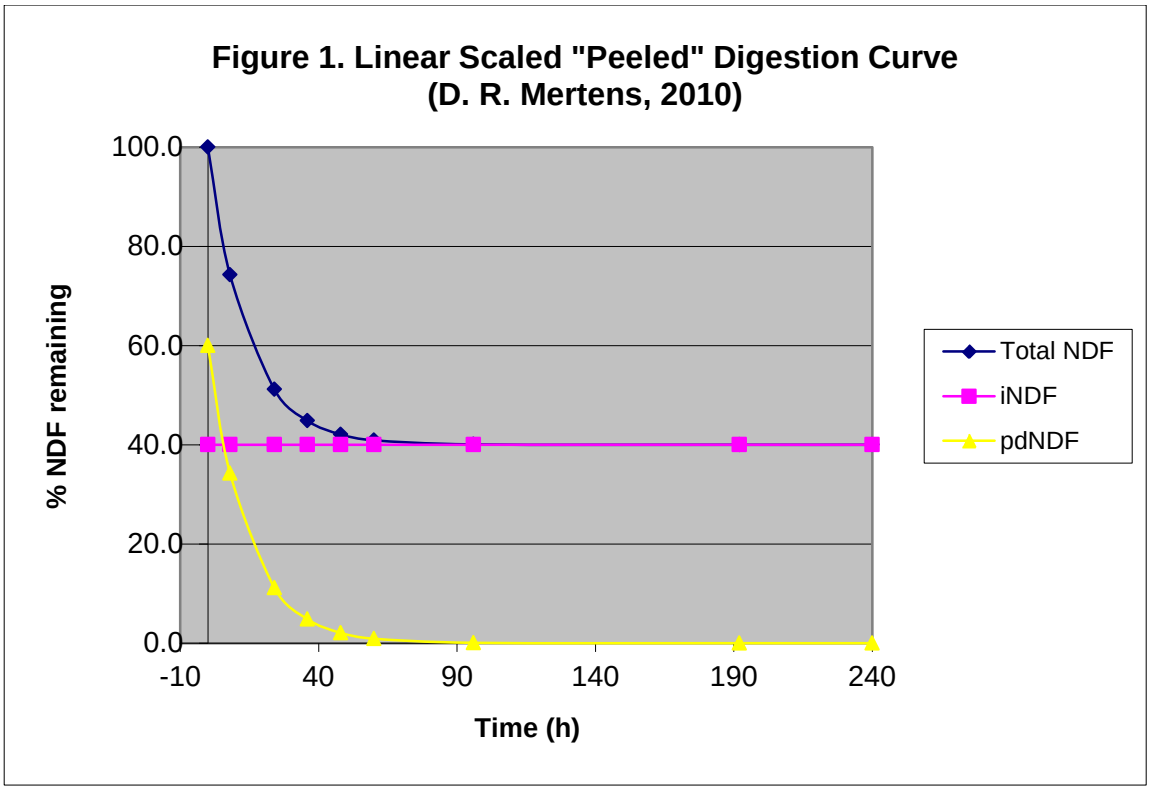
How is the NDF 240 hour in vitro digestibility value to be used?

In the calculation of the rate of NDF digestibility, realize that we are considering the rate of digestion of the digestible portion of the NDF. NDF is composed of both digestible and indigestible fractions. As we are interested in determining the rate of the digestible fraction, we must define the indigestible fraction in order to subtract it out. The long time frame used for determining indigestible fiber has nothing to do with anything related to retention time in the rumen. It is strictly for defining the indigestible pool which allows us to the rest of the fiber in the digestible pool. There is argument then that the digestible pool of NDF should be partitioned into a fast and slow pool, but that is another discussion.

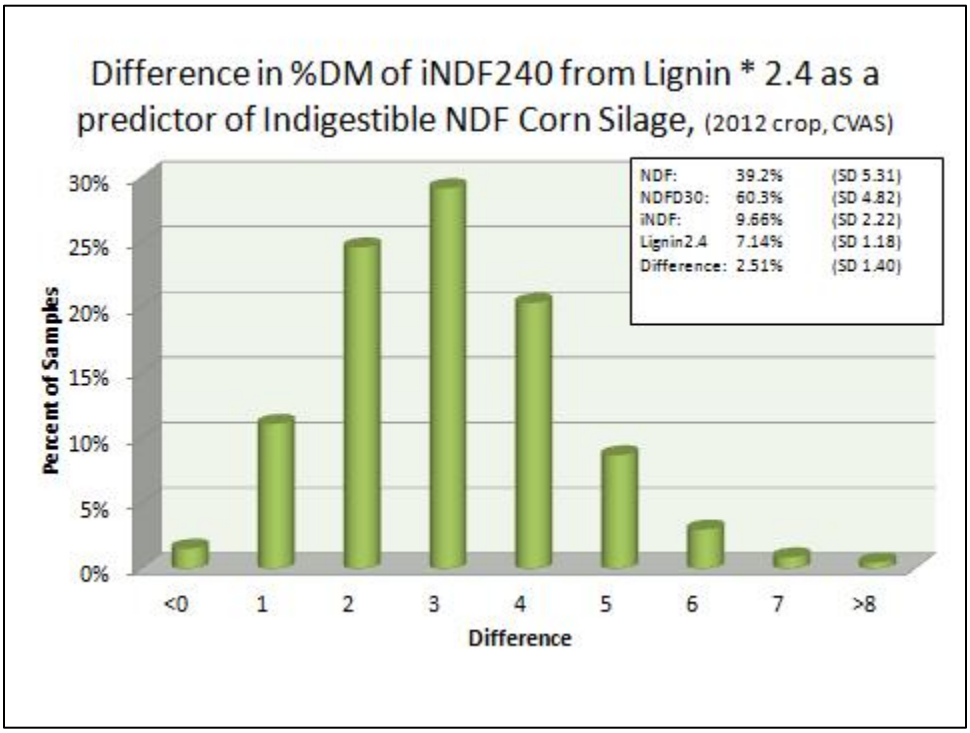
As a visual example of this concept, consider the graph below by Dr. Mertens. In vitro digestion is taken to 240 hours to insure that the indigestible component of NDF is defined, even though in this example most of the potentially digestible fiber is gone by 60 hours (typical for legumes). The total NDF line demonstrates that there is never less than 40% of NDF remaining (iNDF) while the potentially digestible fiber is exhausted by about 90 hours. It is this potentially digestible pool that we need to define.



Historically, based on research by Van Soest and others, it was determined that indigestible fiber could be estimated by taking lignin and multiplying by a factor of 2.4. This was assumed to be a uniform enough factor to be used within and across forage species. This approach has served us well for a number of years as the basis for estimating fiber kinetics for the CNCPS and related models.However, this factor assumes a static relationship between iNDF and lignin within and across forage species which we now know to be incorrect. Based on our work at CVAS, we believe that for corn silage that a factor close to 3.2 times lignin more correctly defines indigestible lignin. The perceived increase in iNDF is due perhaps to our ability to better recover fine particles post incubation compared to earlier procedures using crucibles.

It is interesting to note in the data presented below that not only is the iNDF higher than previously estimated, but that using the iNDF provides greater range. Combined with iNDF having a lower coefficient of variation than lignin, use of iNDF will provide us with greater precision and more opportunity to differentiate between samples.

CVAS has developed NIR equations for prediction of iNDF values of various forage species. We will be using this data as well with chemistry reports to publish rates, since in most situations users can't afford to wait over240 hours for results from the lab! There will more information provided in upcoming tech notes on iNDF in various forage and feed types and its impact on the calculation of rates.



14515 Industry Drive, Hagerstown, MD 21742
www.foragelab.com | mail@foragelab.com | 301-790-1980 | 800-CVAS-LAB