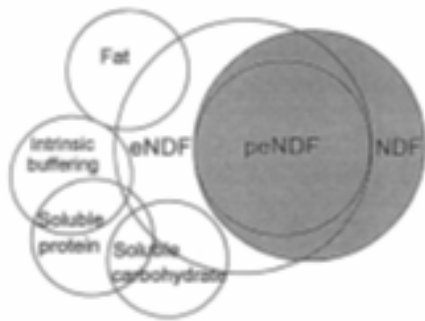


Understanding Feed Test Terms

Primarily we feed rations to supply energy to the cow at every stage of her life cycle. Energy comes in the form of sugars, starches, fat, cellulose, hemi-cellulose and lignin. These substances have varying degrees of digestibility and so by manipulating their amounts in the ration we can produce a mix which meets the nutritional needs of the animal at a best cost for the available ingredients. As laboratory science advances definitions of fibre have been updated to reflect more accurately the value of fibre to the animal.

There is lots of information on NDF and how it is digested. NDF can limit intake in ruminants because of the bulk it contributes and the rate at which it is fermented and digested and how fast it leaves the rumen. Recently an examination of the quality and type of NDF has shown that not all NDF is equal. Some is more digestible than others and therefore of more value nutritionally since it contributes more energy. NDF (Neutral Detergent Fibre) is comprised of Cellulose, hemi-cellulose and Lignin and is reported on all Feed Test Result sheets. Also reported is another category uNDF or uNDF240. This latter term is the undigested fibres after 240 hours of exposure to the detergent used to determine the NDF content. By examining the uNDF240 value and comparing it to milk production or growth a distinction is seen from using the NDF value only. In simple terms this additional test shows us the useable NDF from the unusable NDF for energy generation



Growing conditions, fertilizer rates, harvest date and variety of the crop all contribute to variation in undigestible portion of NDF. By testing all ingredients we can know the start point and rank forages accordingly. Once ranked they can be assigned to a part of the feeding program appropriate to its energy and protein content.

Figure 1. Illustration of the relationships among NDF, physically effective NDF, and effective NDF. We want to understand two aspects of NDF those being what can be digested, and what amount of NDF is needed to stimulate chewing and rumination. The illustration shows the relationship to feed components and these two important parts of NDF intake.

A quote from Dr. David R. Mertens, US Dairy Forage Research Center, USDA-ARS, Madison, WI. In his article entitled “Measuring fiber and its effectiveness in ruminant diets” he illustrates how this is still an emerging science, “Fermentative digestion of fiber is slow and incomplete, and ruminants have developed many attributes that result in efficient digestion. During chewing, they produce salivary buffers that help maintain the pH in the rumen. Ideally, roughages should be an integral part of the diet of ruminants to take advantage of their unique digestive capability. The animal response associated with peNDF is chewing activity. The peNDF of a feed is the product of its NDF concentration and its physical effectiveness factor (pef). The pef varies from 0 when NDF in a feed stimulates no chewing to 1 when NDF promotes maximum chewing activity. Because it is related to fiber concentration, particle size, and reduction in particle size, peNDF is related to the stratification of ruminal contents, which is an important factor in the selective retention of large particles in the rumen, the stimulation of rumination and ruminal motility, and the dynamics of ruminal fermentation and passage.”

The term eNDF (effective NDF) is starting to be seen because research is showing that there are factors that influence milk fat and growth that work with NDF to reduce or boost the effects of NDF alone. Terms will change slightly as knowledge increases but fundamentals are related to how the animal reacts to its feed and this will determine which terms mean the most for ration balancing. As research refines the terms, we see the one most reliable is still peNDF (physically effective NDF). It captures all undigestible fibres and predicts the ability of the ration to generate a good rumen pH and chewing action.

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