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Dairy Pipeline

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Can acid detergent fiber be greater than neutral detergent fiber?

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Interpreting forage analyses is not always straightforward. Some challenges arise because different nutritional models are used to describe how animals utilize feed, while others arise from the limitations of laboratory methods. An important concept is that many forage measurements are based on empirical methods, meaning that the result depends not only on what is present in the forage but also on how the analysis is performed. Lignin provides a good example. Lignin is a component of plant cell walls that contributes to plant structure and limits digestibility. Although the concept of lignin is well defined, different laboratory methods can produce different lignin values for the same forage sample. For instance, a forage analyzed using a 72% sulfuric acid procedure may yield a lower lignin concentration than the same forage analyzed using an acetyl bromide method. Therefore, the measured concentration of lignin reflects both the forage itself and the analytical method used to determine it.

The limitations of empirical methods are also evident in the detergent system of forage analysis. In this system, neutral detergent fiber (NDF) represents the portion of the plant cell wall that contains hemicellulose, cellulose, and lignin. Acid detergent fiber (ADF), on the other hand, includes only cellulose and lignin. Because ADF contains only some of the components found in NDF, it would seem logical that ADF should always be lower than NDF. Yet, under certain circumstances, ADF values can be very similar to NDF values, and in some cases can even be greater. At first glance, this result appears impossible. After all, how can a fraction of the cell wall be larger than the whole? The answer lies in the empirical nature of these analytical methods and in the way different cell wall components are affected during laboratory analysis.

We have frequently observed ADF concentrations equal to or greater than NDF in alfalfa samples analyzed at our Dairy Forage Research Laboratory. A review of the literature suggests that this phenomenon is largely related to the presence of pectin in alfalfa cell walls. Pectin is a structural carbohydrate that is readily solubilized during the NDF procedure because the neutral detergent solution contains agents that effectively remove it from the residue. In

contrast, pectin is only partially solubilized during the ADF procedure. As a result, the NDF residue may contain little or no pectin, whereas the ADF residue may retain pectin remnants. These residual pectin components can contribute to the mass of the ADF residue, leading to an overestimation of ADF concentration and, in some cases, causing ADF values to approach or even exceed NDF values.

The NDF and ADF procedures are typically performed independently, meaning that one portion of a forage sample is analyzed for NDF while a separate portion of the same sample is analyzed for ADF. This approach is known as independent ADF analysis. An alternative is sequential ADF analysis, in which a forage sample is first subjected to the NDF procedure and the resulting residue is then analyzed using the ADF procedure. Because pectin is removed during the initial neutral detergent extraction, it is no longer available to remain in the ADF residue. As a result, sequential ADF analysis eliminates the possibility that residual pectin will contribute to the measured ADF concentration. For this reason, sequential ADF determination is sometimes recommended for alfalfa and other pectin-rich forages when the goal is to obtain an ADF value that more closely reflects the theoretical composition of the cell wall.

This is an important issue because analytical differences can have real economic consequences. Consider the case of alfalfa hay. Relative Feed Value (RFV) is an index widely used to estimate hay quality from NDF and ADF concentrations. Hay buyers, sellers, and producers often rely on RFV to compare hay lots, establish quality grades, and negotiate prices. Therefore, differences in how ADF is measured can influence not only laboratory results but also the perceived value of the forage. For example, an alfalfa hay containing 39.7% NDF and 32.0% independent ADF would have an RFV of 149 and be classified as Fair quality. In contrast, the same hay sample containing 39.7% NDF but 28.7% sequential ADF would have an RFV of 157 and be classified as Good quality. In this example, the forage itself has not changed; only the analytical procedure used to determine ADF differs. Nevertheless, the resulting RFV and hay quality classifications are substantially different. Consequently, the choice of ADF procedure can directly affect forage evaluation, hay marketing, and ultimately the price assigned to a hay lot.

In conclusion, analytical results are not determined solely by the composition of the forage, but also by the methodology used to measure that composition. Understanding the strengths and limitations of empirical methods is therefore essential for the accurate interpretation of forage analysis data.

The Fall Dairy To-Do List: Preparing for Winter and the Year Ahead

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As fall settles in and the days grow shorter, dairy producers are preparing for winter while wrapping up another busy year on the farm. November and December are good months to take stock of the farm, address small problems, and prepare for colder weather before challenges become costly emergencies. Taking time to evaluate feed supplies, check facilities, review herd management practices, and plan for the coming year can help producers enter winter with fewer surprises. Here are six items to consider adding to your late-fall dairy to-do list.

1. Review Your Winter Feed Inventory

Before winter feeding is in full swing, take a good look at what you have on hand. How much hay, baleage, silage, and other feed is available? Will it be enough to get the herd through winter? An inventory can help identify potential shortages while there is still time to make adjustments. This is also an opportunity to evaluate forage quality and ensure feeds are

appropriately matched to the animals receiving them. Knowing what you have now is much better than discovering in February that supplies are running short.

2. Prepare Facilities and Water Systems for Cold Weather

As temperatures drop, check barns, calf housing, gates, fences, waterers, and feeding areas for needed repairs. Pay particular attention to water systems, since frozen or malfunctioning water sources can quickly become a challenge. Make sure water is accessible to all animals and exposed pipes are protected where appropriate. Ventilation is equally important. Although it may be tempting to close buildings to keep them warm, dairy cattle still need adequate fresh air to manage moisture and reduce harmful gas buildup. Limit drafts at animal level while maintaining appropriate ventilation. Addressing these issues before severe weather arrives can make daily chores safer and more manageable.

3. Check Equipment Before Winter Chores Pick Up

Winter puts additional demands on equipment used for feeding, manure handling, and daily maintenance. Inspect tractors, skid steers, feed mixers, generators, and other frequently used machinery. Check tires, batteries, fluids, and lights according to manufacturer recommendations. If equipment has been unreliable throughout the year, consider whether repairs are needed before it becomes essential for daily chores. Review backup plans for power outages and equipment failures, too. Preventative maintenance now may help avoid an inconvenient and costly breakdown during a winter storm.

4. Protect Pastures and Plan for Spring

Even as the grazing season winds down, pasture management remains important. Avoid grazing fields too closely or allowing livestock traffic to damage wet soils. Overgrazing and soil compaction can reduce plant vigor and affect pasture productivity the following spring. Evaluate which fields performed well and which struggled during the growing season. Consider whether soil testing, lime, fertilizer, weed management, or changes to the grazing rotation should be priorities for next year. If fall management opportunities have passed, use your observations to develop a plan for early spring. Keeping notes now makes it easier to prioritize improvements when the growing season returns.

5. Review Herd Health and Winter Management Needs

Late fall is a good opportunity to review herd records and discuss upcoming management needs with your veterinarian and nutritionist. Consider body condition, reproductive performance, transition-cow management, calf health, and recurring health concerns from the past year. Pay special attention to calves and other animals that may need additional protection from cold, damp conditions. Ensure bedding stays clean and dry, ventilation remains adequate, and animals have access to sufficient feed and water. Reviewing herd records can also help identify patterns that may need attention before they affect next year's production or profitability.

6. Close Out the Year and Set Priorities for the Next One

Finally, look back at the past year. What caused the most headaches? Where did the farm lose time or money? What repairs, management practices, or routines could be improved? This does not have to become a complicated plan. Choose two or three practical improvements and write them down. You might prioritize equipment repairs, pasture improvements, more organized recordkeeping, or changes to daily chores. This is also a good time to organize farm records and receipts and discuss year-end financial or tax-planning questions with your accountant. Setting priorities now can make it easier to address improvements before the busy spring season begins.

A Little Planning Goes a Long Way

The transition from fall to winter offers dairy producers an opportunity to prepare for colder weather while reflecting on the year behind them. Reviewing feed supplies, maintaining facilities, protecting pastures, and setting realistic goals can help reduce surprises and improve farm readiness for the months ahead.

A few hours spent planning now can save time, money, and frustration later while helping set the farm up for a productive new year.

Upcoming Events

November 2026
Private pesticide training/recertification begins — ***check your local Extension office for dates and registration requirements***

- Augusta County: November 23, January 5, 2027
- Franklin County: November 12
- Highland County: November 4
- Pittsylvania County: November 17
- Rockbridge County: December 8
- Rockingham County: November 18, December 3
- Smyth County: November 16 & 18

November 5-19, 2026
North American International Livestock Expo

December 14 & 15, 2026
Ag Marketing and Economics Winter Conference w/Dr. Kohl: "Economic and Ag Mega Trends: 2026 and Beyond
- **Dec. 14 (Monday):** 10:00 a.m. - 3:00 p.m. at the Keystone Antique Truck & Tractor Museum
- **Dec 15 (Tuesday):** 4:00 p.m. - 8:00 p.m. at Blue Ridge Community College

February 2027 TBA
Genetics meeting (Rockingham)

March 8-12, 2027
Mid-Atlantic Dairy Workshops
Details TBA

March 28, 2027
Farm Safety Day, Harrisonburg

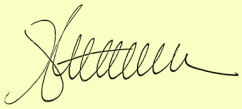
If you are a person with a disability and require any auxiliary aids, services, or other accommodations for any Extension event, please discuss your accommodation needs with the Extension staff at your local Extension office at least 1 week prior to the event.

Additional notes:

▪ The dairy extension group is working with VDH to assist in distributing PPE to dairy farms. Request a kit online at https://shorturl.at/ethov or contact your local extension agent. Requests will be filled as supplies allow.

▪ Your input could guide future programming. Please complete the short survey at https://tinyurl.com/dairy-extension.

For more information on Dairy Extension or to learn more about our current programs, visit us at VTDairy—Home of the Dairy Extension Program online at www.sas.vt.edu/extension/vtdairy.html



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