



# There's more sand in your forage pockets

WHEN teaching forage management and quality, we often start by working toward a shared understanding of the lowest energy components of forage — fiber and ash. Reason being, the nutritious value per ton of the crop can be expanded by lessening the energy burden associated with these low-energy components. Think of it like finding and then cutting a sand bag or two from a hot air balloon.

Next, I often give a bit of background quantifying the lower (or even zero) energy compounds in dairy forage. In understanding how forage analysis laboratories quantify fiber, compare and contrast how your laundry machine cleans your dirty jeans.

In the laboratory, a processed forage sample is placed in a filter bag and rinsed in hot neutral detergent in a mini washing machine for an hour. The result is a neutral detergent insoluble residue (or neutral detergent fiber, NDF).

It's very similar to washing your favorite jeans. Muddy or dirty jeans go in and clean jeans come out. Yet, your jeans may not be completely clean if you were bedding stalls with sand or playing in a sandbox with your children or grandchildren. We can all recall an experience where we put our hands in our pockets after washing and drying our jeans and find there is still sand in the pockets.

Forage fiber is similar — sand and soil will be carried along in the filter

bag and contaminate the fiber residue after the detergent rinse. Laboratories and nutritionists correct for this contamination and report ash-corrected fiber measures. The point here is not to delve further into fiber, but rather to focus on the soil and ash component in feeds.

## Acceptable levels

Ash contamination in forages has proven to be a rising challenge for many over the past decade. For those farming in the South and West, the issue stems back further than that. Anything that does not burn in a 500°C oven is measured as ash, including forage minerals. Thus, some ash within corn silage or alfalfa and grass forage is to be expected. The ash level in standing corn for silage would be roughly 2% to 3% of dry matter, and a reasonable ash level with standing alfalfa or grass forages is roughly 8% to 9% of dry matter.

The difference between these two forages is due to the inherent mineral content, with alfalfa and grass both absorbing considerably greater concentrations from the soil than corn. However, more growers and farms are recognizing ash levels well beyond 4% for corn silage and more than 12% for hay crops. For many, today's forage has more sand in its pockets than it did 10 years ago.

Ash levels beyond those described above come primarily from soil contamination. Forage ash has become a

hot topic for some due to deleterious quality aspects, which will be discussed. Prior to that, recognize that excessive ash can come into forage via additional mediums, including:

- Blowing dust in drought and arid climates
- Flood irrigation bringing dirt or mud up onto plants, and then harvest height being lower than this line
- Soil splashing up onto stems and leaves during pounding rainfall or flooding conditions
- Aggressive raking, tedding, or merging with tines, picking up soil in addition to forage
- Cutting heights being low enough to clip natural or rodent induce of soil mounds within fields
- Forage wagon tires slinging mud up onto floor chains on the underside of the walking floor wagon
- Packing tractor tires tracking mud onto piles or bunks
- Packing tractor blades pushing dirt up into the forage, if packing on dirt floors

## Season long impact

Added ash in forage detracts from forage quality by reducing energy value per ton, buffering the forage during fermentation (creating a more difficult environment to ferment forage), and increasing the fungal and bacterial load, which further reduces feed cleanliness. The energy dilution can be substantial.

Every unit uptick in ash directly

detracts from total digestible nutrient level, and a single unit of excessive ash corresponds to 10 pounds of dirt per ton at 50% dry matter. For dry hay, this number grows to 17 pounds per ton for every unit of ash. The ensiling and feed hygienic factors associated with excessive ash are also increasingly important to understand with today's emphasis on clean feed.

In some cases, the added ash content is unavoidable and little can be done. For example, growing forage in drought conditions or needing to harvest following heavy rains. Both result in unavoidable ash contamination. In these cases, first grasp the total ash level, and then discuss what impact it may have on your nutrition program with your nutrition and veterinary team.

Beyond the unavoidable and thinking progressively, monitor your ash levels from year-to-year as another forage quality key performance indicator. Bring this discussion point up during off-season forage team strategy meetings. While it may not be fun, many are recognizing this challenge and considering it an opportunity to work toward cleaner feed. Getting the sand out of your forage's pockets will improve energy value per ton and result in healthier forage for your herd. 🐄

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