Don’t make your cows eat dirt: Reducing ash in hay and haylage

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What is ash?

Ash in forages from two sources:

- Internal sources (e.g. minerals like calcium, magnesium, potassium, phosphorous).
- External sources (e.g. dirt, sand, bedding).
Why should ash content be a concern?

- Ash provides minerals to the diet, but no calories (i.e. energy).
- Takes the place of nutrients on almost a 1:1 basis.
- Ash content above that contained in plant is dirt contamination.
What about research looking directly at the effect of % ash in the forage in milk production?

“While there have been few dairy research trials in this area, it is highly likely that cows do not milk well when fed dirt.”

Pat Hoffman, Dairy Scientist, Marshfield ARS, 2002
What levels of ash should you expect in a forage test?
Ash Content of Forage Samples

- Plant content of ash:
  - 6% for grass
  - 8% for alfalfa
- rest of ash is dirt contamination

<table>
<thead>
<tr>
<th>Type</th>
<th>Average</th>
<th>Minimum</th>
<th>Maximum</th>
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</thead>
<tbody>
<tr>
<td>Haylage</td>
<td>10.7</td>
<td>4.0</td>
<td>27.0</td>
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<tr>
<td>Hay</td>
<td>9.4</td>
<td>3.2</td>
<td>25.7</td>
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### Ash Content of Forage Samples, 2009 World Dairy Expo

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Possible Causes of Higher Levels of Ash in Forages

Lodged Alfalfa
Possible Causes of Higher Levels of Ash in Forages

Disk Cutterbar

Cutting height
Disc Mower knife type

Those knives that “pick up hay” better, also pick up more ash
Cutting height

- Lower cutting results in more yield
  - 0.5 t/a per year for each inch of alfalfa
- Lower cutting height shortens stand life of grasses
  - Especially smooth bromegrass, orchardgrass, timothy
- Lower cutting height reduces forage quality
  - 5 points RFV per inch
- Lower cutting height increases ash with disc mowers
- Best compromise is generally 2.5 to 3 inches cutting height
Wheel Rakes

- Least Expensive
- High ash potential
  - Adjust wheel float to minimum needed to pick up hay.
Rotary Rakes

- Powered
- High maintenance
- Can ted/rake/merge windrows
- Most expensive
Rake properly
Windrow Merger

- Picks up hay to move across ground
- Expensive
Rake properly

- Keep forage on top of stubble
- Rake so tines do not touch ground
- Move horizontally across ground with rake as little as possible
  - i.e. move two swaths on top of third in middle rather than rake all to one side as shown in previous slide.
- Merger will result in less as on forage than rake.
Possible Causes of Higher Levels of Ash in Forages

Picking up soil when harvesting
Possible Causes of Higher Levels of Ash in Forages

Hay & Silage on the ground
What can you do?

- Cut hay onto layer of stubble
- Keep hay off ground
  - Wide swath
- Set rake not touch soil
- Merge rather than rake