Dairy Cattle Feeding-Related Issues With 2009 Corn Crop

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Harvest & Storage Issues

- Wet Corn
- Mold/Mycotoxins
- Yeast

Harvest & Storage Options

- Snaplage (SNG)
- High-Moisture Shelled Corn (HMSC)
- Dry Shelled Corn (DSC)

Table 1. High Moisture Corn Storage in Conventional, Bunker, Bag, and Oxygen Limiting Silos

Conventional Top Unloading Silos, Bunkers, and Silo Bags

	Corn Kernel Moisture, %		
	Minimum	Desired	Maximum
Ear Corn	26	32-36	40
Shelled Corn	26	28-32	36

Bottom Unloading Oxygen Limiting Silos

	Corn Kernel Moisture, %		
	Minimum	Desired	Maximum
Ear corn-rolled*	26	28-32	36
Shelled corn	24	26-28	32

**OL Silo with Forage Unloader*

Source: Rankin, 2009

High-Moisture Corn Storage Options

- Lactobacillus buchneri (LBUC) or combination inoculant
- Propionic Acid (PROP)
- Mixed Organic Acid (MOA) Product
- Anhydrous Ammonia or Aqua-Ammonia

Table 2. Recommended application rates of propionic acid to preserve high moisture corn

Corn moisture %	Lbs. propionic acid to apply per 1000 lbs. wet corn[1]		
	----------Months corn to be stored----------		
	6	9	12
20	3.3 - 5.0	4.0 - 6.0	5.0 – 7.5
25	5.0 - 6.5	6.0 - 8.5	7.5 – 10.0
30	6.5 - 8.5	8.5 - 11.0	10.0 – 12.5
35-40	8.5 - 10.5	11.0 - 14.0	12.5 – 15.0

[1]Use lower rate for well-mixed corn and higher rate if acid and grain cannot be well-mixed.

Source: Rankin, 2009

Harvest & Storage Comments

- Advantage of DSC is mold/yeast shut down, can exclude fines, & can dilute easily
- Advantage of SNG is can get it off now
- HMSC is the intermediate solution
  - Leave the cob in field!
  - 35% kernel moisture less risky than 40%, i.e. yeast/ethanol issues
  - Relying on low pH (inoculant can help) & oxygen exclusion
  - If wet HMSC/yeast of more concern than mold, then LBUC or MOA likley to be more effective than PROP
  - Plan storage so that worst corn can be fed before spring/summer
  - Coarse roll (2,500 micron MPS) best on wet HMSC

Potential Feeding Issues

- **DSC**
  - Reduced test weight
  - Mold/Mycotoxins

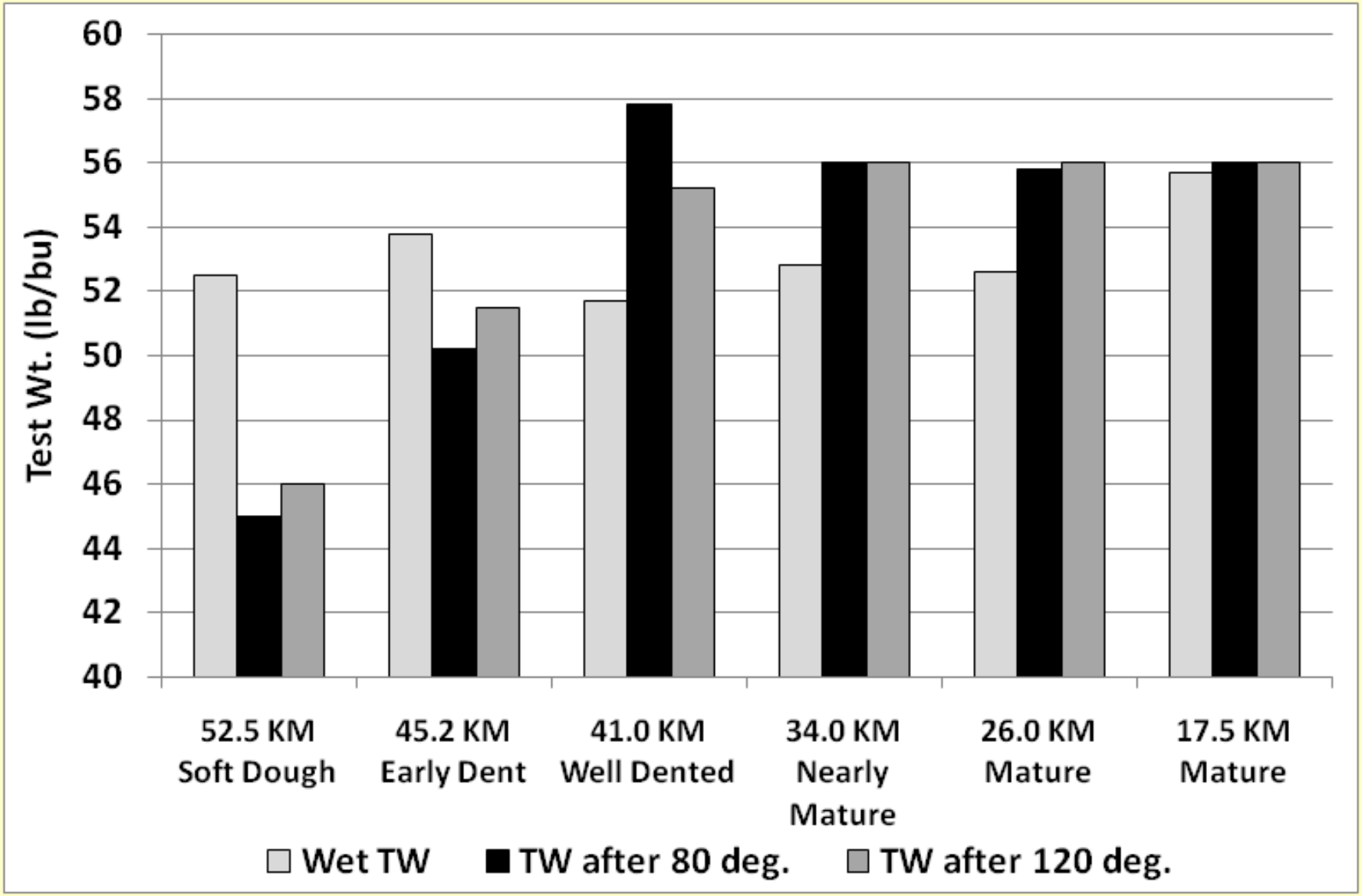


Figure 1. Wet and dry test weights for grain harvested at soft dough through mature kernel stages and dried to 15.5% moisture at 80 or 120 degrees (Hicks, 2004)

Source: Rankin, 2009

DSC Feeding Considerations

- <50 lb./bu. test weight, discount normal DSC energy value by 5%
- Feed by weight not volume
- Test for nutrient composition including starch content, have labs estimate the energy value using summative energy equations, & adjust ration
- Test for mycotoxins
  - Dilute, use binders, discard as necessary

Potential Feeding Issues

- **HMSC**
  - Reduced starch content
  - Fast rate & high extent of ruminal starch digestion
  - Yeast/ethanol fermentation
  - Poor aerobic stability during feed-out
  - Mold/Mycotoxins

Potential Feeding Issues

- **SNG**
  - Reduced starch content
  - Increased NDF content
  - Increased variability in starch, NDF & energy contents
  - Fast rate & high extent of ruminal starch digestion
  - Yeast/ethanol fermentation
  - Poor aerobic stability during feed-out
  - Mold/Mycotoxins

HMSC & SNG Diagnostics

- **Testing**
  - Nutrient composition including starch & NDF contents
  - Labs estimate energy value using summative energy equations
  - Particle size
  - Fermentation profile
  - Mycotoxins

HMSC & SNG Feeding Considerations

- **Adjust ration based on nutrient composition, energy value & particle size**
  - May require partial substitution with DSC, but feed-out rate must be adequate
  - May require using more dietary buffer
  - May require using byproduct fiber sources
- **Determine & monitor corn DM content to adjust as-fed corn feeding rate, so that desired amount of DM fed**
- **If bunk stability poor, may require back-end use of TMR preservative products**
- **Depending on results of mycotoxin tests, dilute, use binder, discard as necessary**

Resources

High Moisture Corn Harvest and Storage Considerations

by Mike Rankin

http://www.uwex.edu/ces/cty/columbia/ag/documents/HMCorn09.pdf

Adding Organic Acids to High Moisture Corn

by Patrick Hoffman and Irv Possin

http://www.uwex.edu/ces/crops/uwforage/HMC-OA.pdf

Understanding Corn Test Weight

by Mike Rankin

http://www.uwex.edu/ces/cty/columbia/ag/documents/CornTW09.pdf

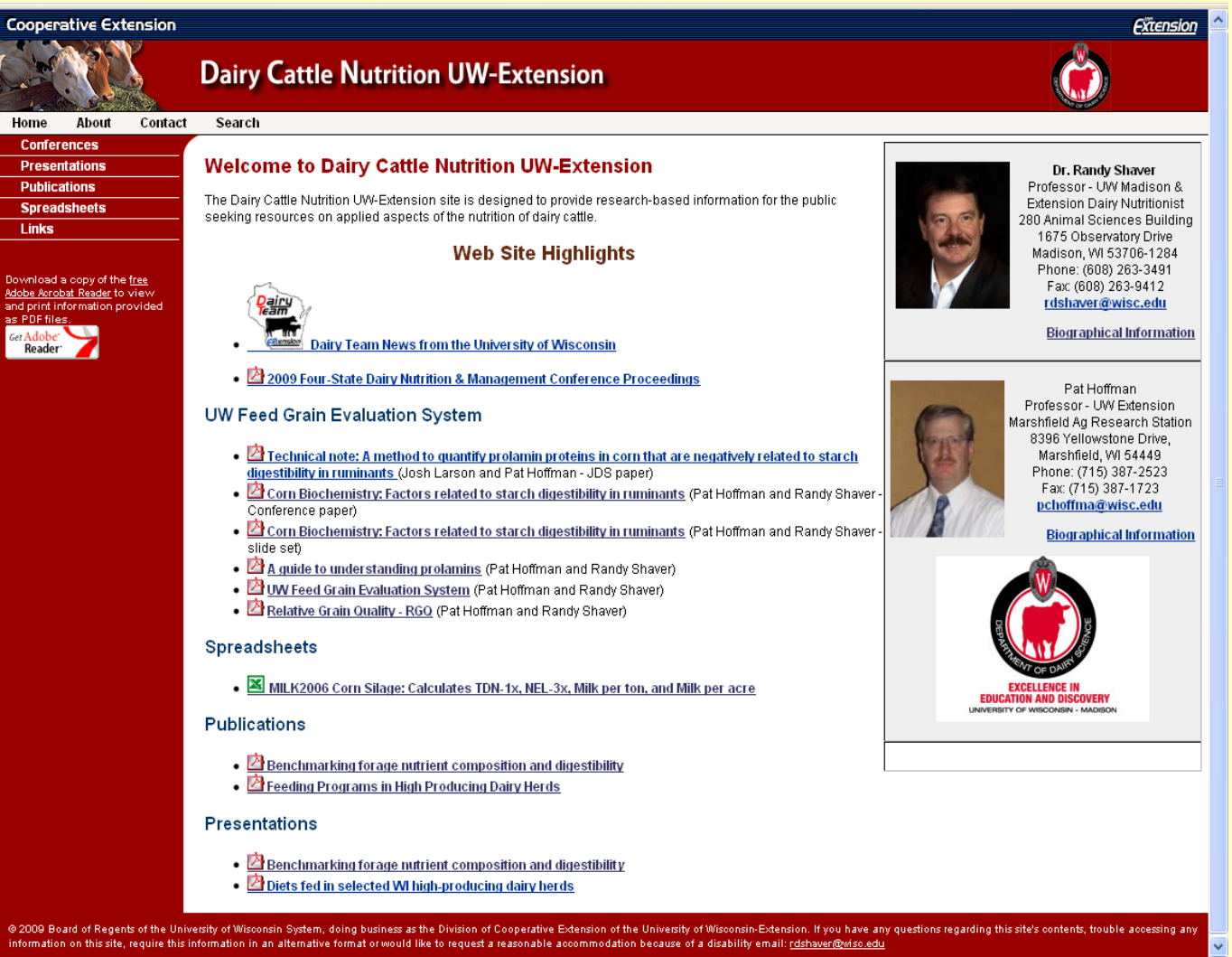
2009-2010 Dairy Cattle Feeding Issues with High-Moisture Corn, Snaplage and Dry Shelled Corn

by Paul Esker, Randy Shaver, Jim Leverich, Mike Ballweg, Pat Hoffman and Mike Rankin

http://www.uwex.edu/ces/cty/columbia/ag/documents/0910cornfordairycattleeskeretal.v10-28-2009.pdf

Visit UW Extension Dairy Cattle Nutrition Website

http://www.uwex.edu/ces/dairynutrition/



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