Producers, Custom Operators, Nutritionists and Growers
Are we all talking the same Language?

Chris Wacek- Driver
Forage Innovations, LLC
“The Greatest Competitive Advantage of any Industry or Business, large or small is continuing growth and development of its people”

Bob Milligan
Outline

1. Planning – Setting Goals
2. Working the Plan
3. Evaluating the Results
4. Few thoughts on Language
Planning the Work
or
Setting Goals
Top Challenges Cited

- Corn Silage Too Dry
- Butyric Haylage
- Burnt/Dry Haylage
- Too much Shrink
Goals-Haylage

- Moisture
  - Target 52-63%
  - Sweet Spot 55=60%
- RFV
  - Target 170-235
  - Sweet Spot 190-220
- Reduce Shrink
- Improve Forage Consistency
Consequences of Harvesting Alfalfa Too Wet or Too Dry

**Too Wet**
- Clostridia- protein degradation
- DM loss/ Energy Loss
- Decreased digestibility
- Butyric acid/poor fermentation
- Effluent run off

**Too Dry**
- Poor Packing
- Aerobic spoilage
- Heat damaged protein
- Low digestibility
Working the Plan
Evaluating the Results

- Did we hit our Goals? Why or why not?
- Could a better plan could be developed? Do we need a “B” plan?
- Who do we need to visit with to improve it?
- If you Couldn’t control it – don’t beat yourself up about it
Are We Talking the Same Language?
The tug o’ war....

Long Cut-TLC

Adequate Processing
Cover more Acres
Less power

Less breakdowns
Maintenance

Short Cut -TLC

Excellent Processing
Slow Down
More Power

Wear and Tear
What we know........

- Corn Silage is unique - it is a mixture of grain and stover - variable amounts
- Both Fiber and non-fiber components (starch & sugar) affect the nutritional value of corn silage
- It has become a larger portion of diets - yield potential and nutrient management
What we know........

Particle size affects both components

- The digestion of starch in kernels and fiber
- The physical effectiveness of fiber.
What we know........

Particle size also affects:
  packing density
  fermentation
  power/fuel consumption
  harvest time
What Do We *Think* the Cow Wants?

Cow (rumen and bugs) need fiber
- Digestion
- Chewing activity
- Rumen health & function
The Language...

are we speaking the same vocabulary

1. Fiber particle Size
2. Processing
So how do harvesters measure length?

TLC- Theoretical Length of Chop

How do we set it?
How do Nutritionists measure it?
So how do they Compare???

Length of Cut vs. Mean Particle Size
Corn Silage

Mean Particle Size (in)

Length of Cut (mm)

$R^2 = .234$
TLC vs. Forage on Top Screen
Penn State Box

Length of Cut vs. % Forage on Top Screen

$R^2 = .511$
The Language......
are we speaking the same vocabulary

1. Fiber particle Size
2. Processing
What Do We *Think* the Cow Wants?

- To maximize starch digestion
- Coarse particles >4.75 mm
  - Rate of digestion will be slow
  - May escape rumen as unchewed particles
- It costs money to not have it processed
What affects it?

Machinery
- Length of cut – shorter is easier
- Processor design & wear
- Roll gap
- Roll aggressiveness
- Differential
- Capacity - Tons/hr.

Environment
- Temperature
- Moisture
- Soil Type
- Fertilization

Crop
- Kernel Moisture/Maturity
- Time in Storage (fermentation)
- Endosperm characteristics
- Kernel or Cob Size?
So how do Harvesters measure processing?

- Processor Roll Gap?
- Visual?
- Setting on the Chopper?
How do Nutritionists measure it?

% of Starch passing through a 4.75 mm screen
Water Test

Figure 1. Chopped whole-plant corn placed into water.

Figure 2. Gently agitating material to help the kernels sink to the bottom of the container.

Figure 3. Skimming and removing the floating stover.

Figure 4. Carefully draining the water so only the kernels remain in the container.

Figure 5. Example of separated stover and kernel fractions using the water separation technique.
Wisconsin Water Test
Technology, Design, Lab tests, Data can help....

but knowledge and people will move us forward
Ultimately .... For a system to work optimally knowledge needs to flow between components of the entire system.

Everyone needs to be on the team or the system won’t work optimally