

# Update on Corn and Corn Grain Use on Dairy Farms

Florida/Georgia Corn Silage and Forage Field Day

*Mike Hutjens*

*Extension Dairy Specialist*

**University of Illinois Extension**

# Today's Program

- **Shredlage processed corn silage**
- **Snaplage as a high moisture corn**
- **Evaluating starch use in dairy cows**
- **Your questions and concerns**

# Shredlage Update



# Shredlage: What Is It?

- Longitudinally ripped forage (increase surface area)
- Stalk pieces about the size of an alfalfa stem (1.25 inch TLC or 30 mm)
- Rhine of plant completely opened up.
- Smashed corn kernels
- Seems softer and fluffier.



**Shredlage**

**KP**



Photos provided by Kevin Shinnars, UW Madison, BSE



**Shredlage**



**KP**



Materials resulted from water separation technique done by Kevin Shinnars, UW Madison, BSE



# Penn State Separator Box (as-fed basis)

| Screen, mm | Shredlage | KP    |
|------------|-----------|-------|
| 19         | 31.5%     | 5.6%  |
| 8          | 41.5%     | 75.6% |
| 1.18       | 26.2%     | 18.4% |
| Pan        | 0.8%      | 0.4%  |

Samples obtained  
during feed-out  
from the silo bags



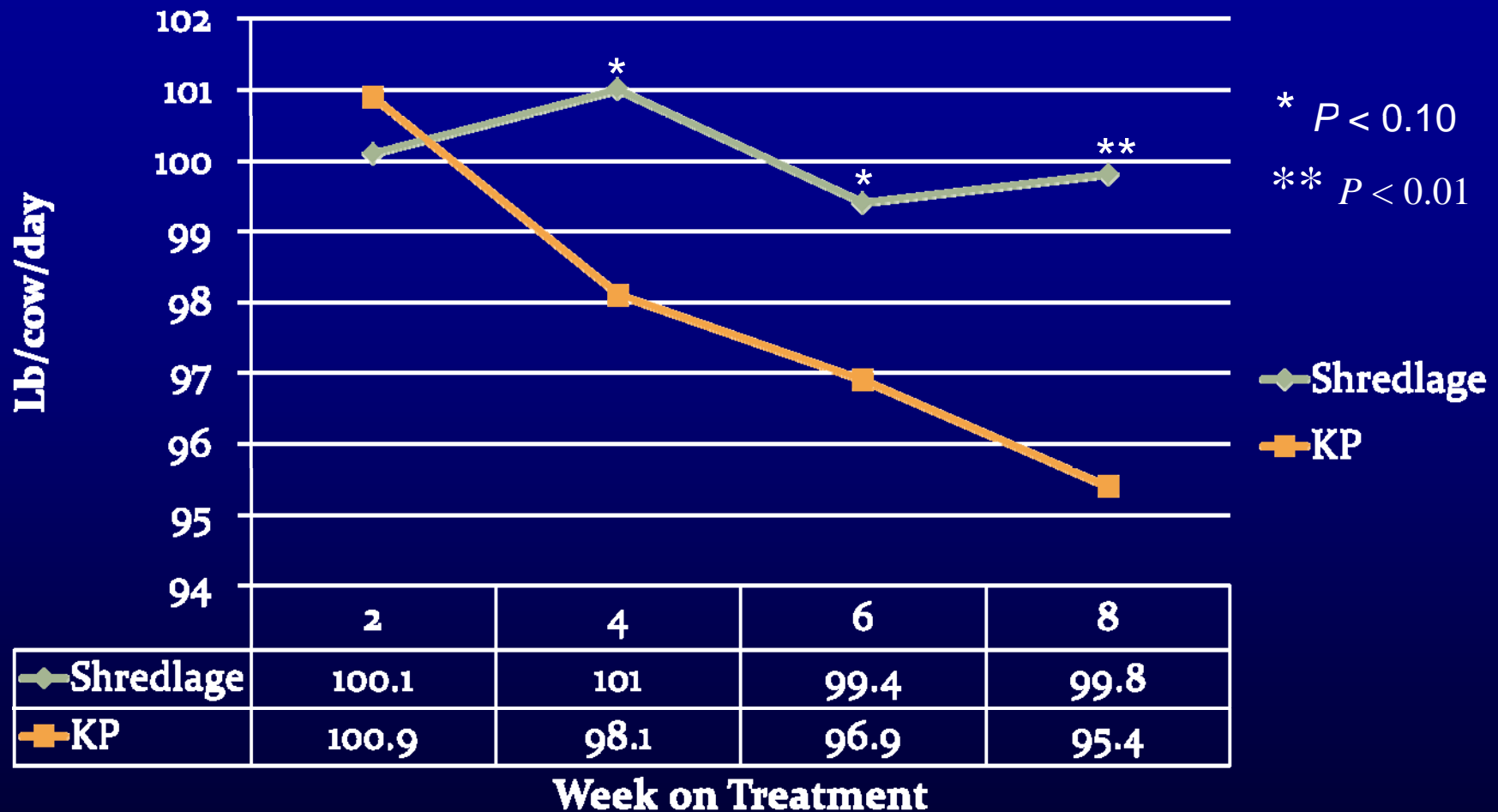
# Component-Corrected Milk Yields

|                | Shredlage | KP   | P <  |
|----------------|-----------|------|------|
| 3.5% FCM, lb/d | 100.1     | 97.8 | 0.07 |
| FCM/DMI        | 1.77      | 1.79 | 0.65 |
| ECM, lb/d      | 99.2      | 97.2 | 0.10 |
| ECM/DMI        | 1.76      | 1.77 | 0.50 |

Luiz Ferraretto & Randy Shaver Dairy Science Department,  
UW Madison



# 3.5% FCM Yield by Week



**Week × Treatment Interaction ( $P < 0.03$ )**

# Wisconsin Farm Shredlage

Top: 44%



Middle: 27%

Bottom: 29%





Top: 44%





**Middle: 27%**





**Middle**





**Bottom: 29%**





# 2012 Illinois Winning Corn Silage Sample (Conventional Processed)

**Top:            63g            13.3%**

**Middle:        326g           68.8%**

**Bottom:        85g            17.9%**

**Top Box: 13.3%**





**Middle Box: 68.8%**





**Bottom Box: 17.9%**





# Penn State Separator

|             | Top                  | 2nd  | 3rd  | Bottom |
|-------------|----------------------|------|------|--------|
|             | -----% (as fed)----- |      |      |        |
| TMR         | 10-15                | > 40 | < 30 | < 20   |
| Haylage     | > 40                 | > 40 | < 20 | < 5    |
| Corn silage | 5-15                 | > 50 | < 30 | < 5    |

(3/4 TLC-Process)



# Snaplage Alternatives



# **Snaplage Alternative**

- **Includes ear, husk, and parts of the plant**
- **Contain 25% NDF and 50 to 60% starch**
- **Increase yield by 15 to 25% dry matter / acre**
- **80 to 90% energy value of shelled corn**
- **Harvest at 40 to 45% dry matter (at black layer)**
- **Inoculate with *L. buchneri***

# Nutrient Comparison of HMC

Shelled Ear Snaplage

----- % -----

Dry matter 28-32 32-36 38-45

Starch 70-72 60-65 50-60

NDF 9 20 16-23

Protein 10 8 8-10



# Management Considerations

- Starch is rapidly fermented due to the higher moisture content
- Cob and plant portion has 60% value of corn (value of grass forage)
- May need to add dry corn or barley
  - Reach desired ration starch levels
  - Slow down the rate of starch degradation
- Monitor milk fat test and dry matter intake

# Fecal Evaluation

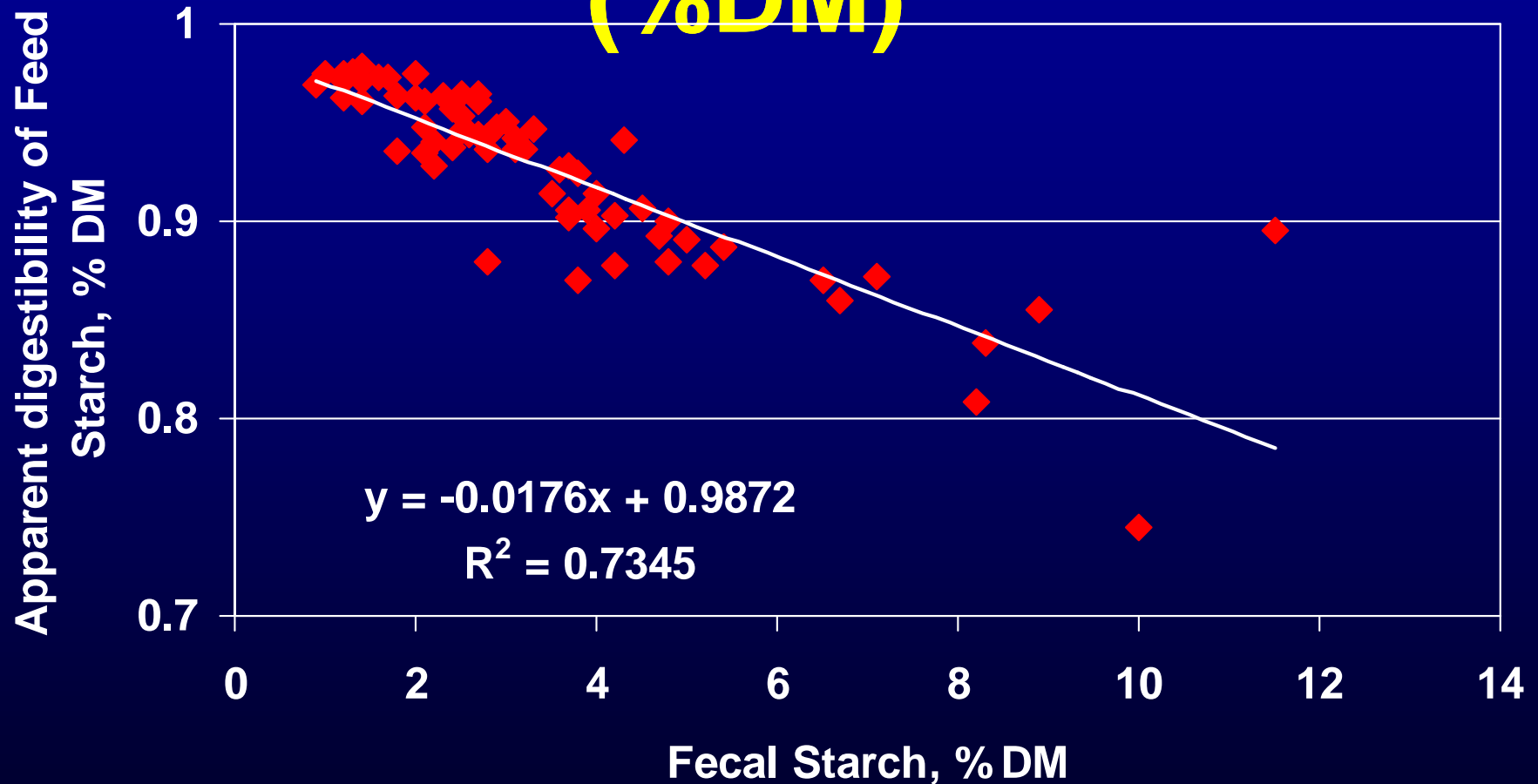


# Evaluating Manure

- **Fecal starch analysis**
  - Measuring total tract starch utilization
  - Economic loss in milk yield
- **Manure washing**
  - Physical presence of feed particles
  - Forage quality evaluation
- **Manure scoring**
  - Cow responses - sorting, days in milk, pen evaluation



# Apparent digestibility of feed starch and fecal starch (%DM)



# Illinois Herd Results

| <b>Variable</b>         | <b>Mean</b> | <b>SD</b>  | <b>Range</b>       |
|-------------------------|-------------|------------|--------------------|
| <b>Starch dig (%)</b>   | <b>84.6</b> | <b>7.0</b> | <b>70-96</b>       |
| <b>Fecal starch (%)</b> | <b>6.0</b>  | <b>1.6</b> | <b>3.9 - 9.9</b>   |
| <b>Fecal lignin (%)</b> | <b>7.2</b>  | <b>4.4</b> | <b>3.7 - 19.2</b>  |
| <b>Fecal NDF(%)</b>     | <b>55.5</b> | <b>4.1</b> | <b>14.0 - 30.3</b> |
| <b>Feed starch (%)</b>  | <b>22.4</b> | <b>2.0</b> | <b>19.9 - 26.4</b> |
| <b>Feed NDF (%)</b>     | <b>32.6</b> | <b>1.6</b> | <b>29.8 - 34.8</b> |
| <b>Feed lignin (%)</b>  | <b>3.4</b>  | <b>0.4</b> | <b>2.5 - 4.1</b>   |



# Milk response

- Fecal starch should be less than 4.5% represents total tract apparent digestibility of 90+ percent.
- If fecal starch can be reduced 1 unit (absolute decrease from 10% to 9%), milk production could increase 0.67 pound (dry matter intake remains constant).

# WASHING MANURE

- Use a number 6 or 8 screen
- Evaluate a cup of manure
- Use pressurized water
- Cows to evaluate
  - dry cows
  - fresh cows
  - high cows
  - high producing 1st lact cows
  - various groups of cows





# MANURE SCREENING

- Rumen
  - Passage of split soybeans
  - Presence of whole cottonseed
- Processing
  - Appearance whole soybeans
  - Presence of whole corn seed
  - Presence of forage particles over 1/2"
- Combination of rumen and processing
  - Appearance of starch in corn seed



# CONSISTENCY

- **Score 1 Thin, fluid, arcs, green**
  - Example: sick cow, off feed, cows on pasture
- **Score 2 Loose, splatters, little form**
  - Example: fresh cow, cows on pasture
- **Score 3 Stacks up 1 to 1 1/2 inches, dimples, 2 to 4 concentric rings, sticks to boot**
  - Example: Recommended
- **Score 4 Stacks up 2 to 3 inches, dry**
  - Example: Dry cow, low protein, high fiber
- **Score 5 Stacks up over 3 inches**
  - Example: All forage, sick cow







**Manure Score 1**

University of Florida



**Manure Score: 2**





**Manure Score: 3**









A close-up photograph of a large pile of dark brown, moist manure. The manure is piled on a bed of dry, yellow straw. The manure has a crumbly, moist texture with some visible clumps. The straw is scattered around the pile, with some pieces lying on a grey concrete surface at the bottom of the frame. The lighting is bright, highlighting the texture of both the manure and the straw.

**Manure Score: 4.0**











A close-up photograph of a pile of dark brown, moist manure resting on a bed of straw. The manure is piled in the center-right of the frame, showing a moist, clumpy texture. The straw is light brown and scattered around the manure. Overlaid on the manure is the text "Manure Score: 5" in a bold, yellow font.

**Manure Score: 5**



# MANURE CHANGES

| Stage of lactation    | Scores |
|-----------------------|--------|
| • Dry cow             | 3.5    |
| • Close up dry cow    | 3.0    |
| • Fresh cows          | 2.5    |
| • High cows           | 3.0    |
| • Late lactation cows | 3.5    |

# MANURE/FEED FACTORS

- **Excess degradable or soluble protein**      **Lower**
- **Excess total protein or RUP**      **Lower**
- **High levels of fiber/forage**      **Higher**
- **Excessive starch/grain**      **Lower**
- **Lack of effective NDF**      **Lower**
- **Excess minerals**      **Lower**

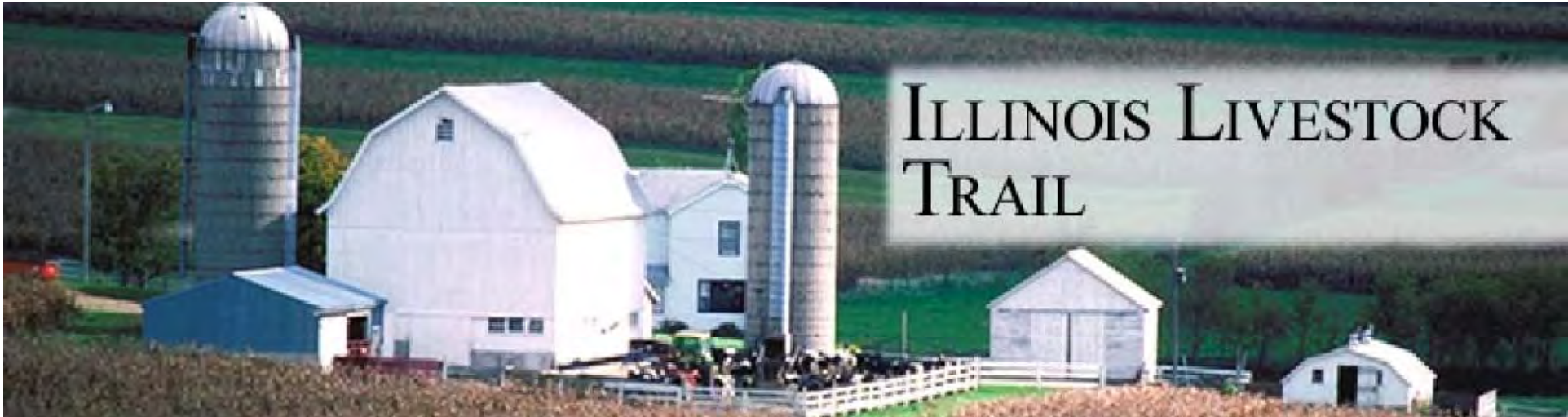
# Evaluating Manure Scores

- High groups
  - < 5% at 1
  - < 20% at 2
  - > 80% at 3
- Low groups
  - No score 1
  - <10% at 2
  - >90% at 3



# Take Home Messages

- Shredlage may be an alternative to replace hay and long forage particles.
- Snaplage will be an attractive alternative for some dairy managers.
- Monitor starch utilization including fecal and *invitro* analysis.



# ILLINOIS LIVESTOCK TRAIL

<http://www.livestocktrail.uiuc.edu>

**ILLINI DAIRYNET**  
The Online Resource for the Dairy Industry



<http://www.livestocktrail.uiuc.edu/dairynet/>



Questions?