



A New Era in Forage and Grain Processing Technology

Roger Olson PAS
Ross Dale
Bob Scherer

What is Shredlage™?

In addition to crushing the kernel, Shredlage™ is longer cut corn measuring 26mm – 30mm TLC with the stalk ripped length wise into planks and strings allowing for improved effective fiber, better packing and a greater exposure to the inner cells of the plant for increased microbial activity.



Process Comparison

Kernel Processor



Shredlage™ Processor



Photos taken of silage bags from the University of Wisconsin study

SHREDLAGE™ The Story

- The young Missouri Dairyman
- Introduction to Roger Olson
- Asked “Dad” Loren Olson
- Built Prototype in Shop
- Looking for Developing Partner
- Introduced it to Bob Scherer
- Prototype in less than 60-days
- Development to Today

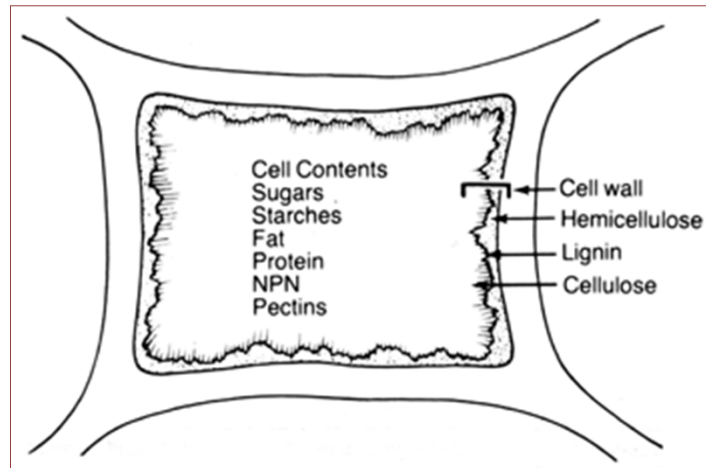


WHY SHREDLAGE™ ?

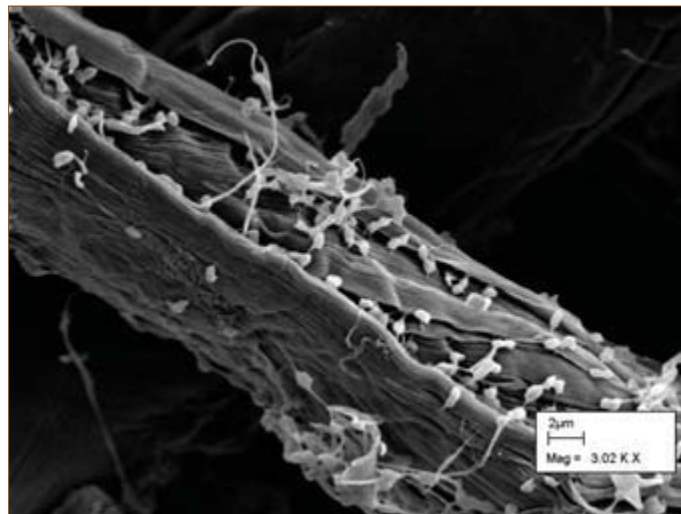
It's all about the cow and the rumen!!!!

- Increase physically effective fiber while increasing fiber digestibility.
- Eliminate straw, alfalfa hay etc.(Add more digestible Shredlage™)
- Increase corn silage (usually low cost ingredient)
Make less haylage "all Summer"

Fiber – Cell Wall Make Up



Microbial Attachment Surface Area



Bacteria attacking a strand of fiber that was taken from a cow's rumen.

Other Considerations

IT MUST:

- Process the kernels as good or better than previous.
- Open up the harvest window to go dryer while having palatable feed
- Cows must not be able to sort the TMR
- Slow the chopper as little as possible

Demonstration Results

**Many Choppers • Many States
Different Conditions • Different Moistures**

- Higher % of corn silage diets.
- Chop with moisture into the lower 60's. By accident
- Diets under 70% Shredlage™
 - may not need to be 30 MM long
 - 21MM looks OK based on shaker box.
- Custom operators like the better processing

Development Lessons

- **Conventional processors did NOT work**
 - Modified conventional processor in spite of Loren's council
- Did not explode the stalk adequately
- Did not damage the kernel adequately (It did reduced forage fraction to smaller fragments)
- Did not hold up with longer cut
 - Damaged the processor
- They simply did NOT produce Shredlage™

30 Millimeter Shredlage™ 64% H2O
Shaker Box= 35-45-19-1



What do the Cows Think?



What Do The Cows Think?

- Eat it aggressively with little sorting at 30 MM and Less
- 40-50 MM is sortable
- Greatly increases Physically Effective Fiber
 - No straw, no dry hay, etc. (Shaver 2012-13)
- Appears as though the NDF digestibility has been increased.
 - Manure Screens, Production responses. Further testing is planned. (Shaver 2012-13)

Penn State Separator Box (as-fed basis)

Samples obtained during feed-out from the silo bags

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%

Dairy Science Department, UW Madison

Experimental Diets (DM basis)

	Shredlage™	KP
Shredlage™	50%	---
KP Silage	---	50%
Alfalfa Silage	10%	10%
Ground Dry Shelled Corn	10.3%	10.3%
Corn Gluten Feed	7.4%	7.4%
SBM 48%, solvent	6.9%	6.9%
SBM, expeller	9.3%	9.3%
Rumen-Inert Fat	1.9%	1.9%
Min/Vits	4.2%	4.2%

Dairy Science Department, UW Madison

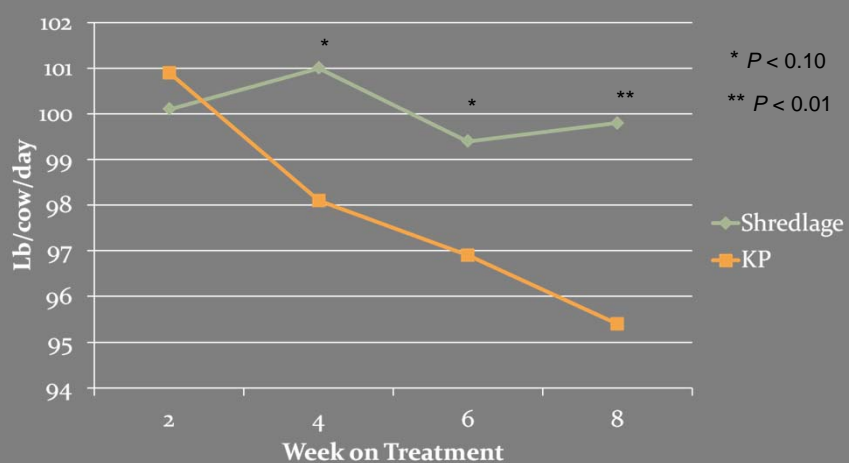
Penn State Separator Box (as-fed basis)

TMR Samples

Screen, mm	Shredlage	KP
19	15.6%	3.5%
8	38.2%	52.9%
1.18	38.9%	35.8%
Pan	7.3%	7.8%

Dairy Science Department, UW Madison

3.5% FCM Yield by Week



Week \times Treatment Interaction ($P < 0.03$)

Dairy Science Department, UW Madison

Increasing Value Widens the Window

- Previously hard to process forage portion had more “cigarette butts”; Less digestible.
- Shredlage™ processes well; forage stalk is completely opened up.
- Late season drought resistant hybrids keep NDFd's higher as matures.

What Are the Possibilities?

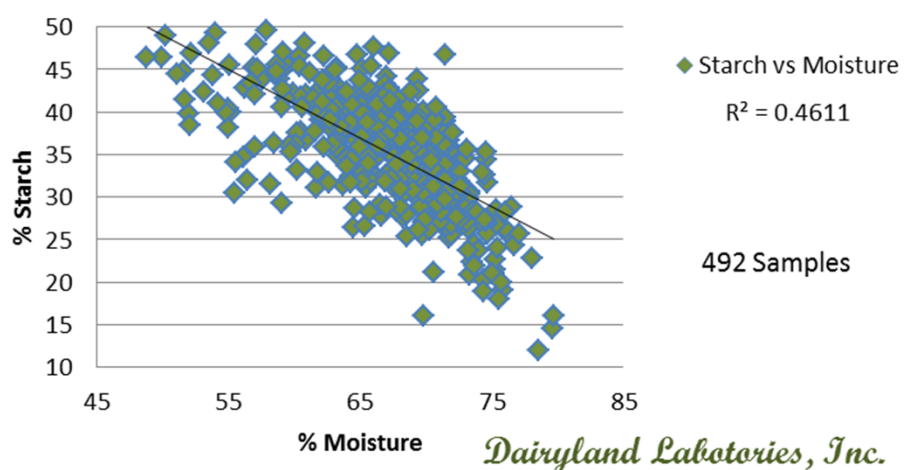
- The very high corn silage diets seem to work best with the lower 63-64's moisture.
- Planning maximum 85% Shredlage™ of forage.
 - Only because of starch % and NFC degradability.
 - Process very well fall feeding, Not as well for Next Summer
- Will not need much corn consider dry corn.
- Drought Shredlage™ diets
 - 26 MM accommodate more byproducts.

Increasing Starch ¼ Milk line vs. ¾ Milk line

Dr. Shaver presented info showing:

- ¼ Milk line = 29% starch
- ¾ Milk line = 37% starch.

Starch vs Moisture 2011 Corn Silage



Harvest Recommendations

- Potentially a little dryer than regular silage.
- 65-67% Moisture
- At least ½ milk line
- (sequence the fields based on milk line)
- Make sure shredder is set properly to make shredlage like the picture!!!
- BMR may need another ½ MM closer than conventional silage.

Hi Shredlage™ Diet



Extreme diets with Shredlage™

- 2011-2012 feeding All Shredlage™
 - Not suggesting these diets!!!! but have worked well
- All diets No Straw, No Hay etc. 2011-12 feeding season
- BMR silage YES.
- Many diets with fecal starch Less Than 2%

Shredlage™ – bm3

Mycogen Seeds

Duane Shores
John Anderson

Shredlage™
30 mm cut and 2 mm KP setting



Very High Amt on Top PS Box Screen
Excellent Kernel Processing

Also Note:
Many of the middle screen particles have very substantial length



How does it pack?



How does Shredlage™ PACK?

- = > than conventional silage - Bunkers
 - 68% KP silage 16.9#'s DM/ cubic foot
 - 61% Shredlage™ 20.4#'s DM/ cubic foot
- UW trial showed a slight increase with Shredlage™ in bags.
- Brian Holmes study 2012-13 Feeding Season.



Lyndon Luckasson



- **“Patent Pending” and “Trademarked” Technology**

Units Available for 2013

- Claas 494's (930-960) HPS and HPMS
- Claas 494's (970-980) HPS and HPMS
- Claas 492's & 493's (900-830) HDS

Features

- 1 year full warranty
- 5 year frame warranty
- Cab Display Monitoring Bearing Temp, Air Pressure



HPS and HPMS Processor

HPS fits 494 Model years 2008-2011
HPMS fits 494 Models 2012 and Newer



REQUIREMENTS:

494 Series (930-980)

24-KNIFE DRUM • 20-KNIFE DRUM • 36-KNIFE DRUM

*APPROPRIATE DRIVE SYSTEM

****WE NO LONGER WARRANT REMOVAL OF ANY KNIVES IN THE
20 OR 24 KNIFE DRUM.**



HDS Processor

Fits All 492 and 493 Models



REQUIREMENTS:

492 and 493 Series (830-900)

24-KNIFE DRUM • 20-KNIFE DRUM • HALF-SECTION KNIVES

*SOME MACHINE MODIFICATION REQUIRED

****WE DO NOT WARRANT REMOVAL OF ANY KNIVES.**

REQUIREMENTS:

Half-Section Knives



Unit Installed



Misting Oiling System



Cab Display Monitoring Bearing Temp. and Air Pressure



Krone, New Holland, John Deere

- Have rolls available for the 2013 season



Takes Homes

You can make designer silage (long, short, well processed, dryer) You Decide

Midwest Economics generally favor more shredlage

Have a plan to manage NFC degradability (Well process Fall, not so well Summer) (dry corn if mostly shredlage)

26-30 MM shredlage has lots of endf

BMR & Shredlage go together very well

Takes a serious piece of equipment to make shredlage (Rolls, bearings, frame)

I Like Mid 60's-Higher 60's over ½ milk line Normal diet

Make sure the chopper is set up correctly!!!

Thank You



Shaker Box Results

- 30 MM TLC 35-45-19-1
- 22 MM TLC 18-58-22-2
- 17 MM TLC 9-71-18-2
- Conventional KP 8-60-30-2
- 62% Moisture Average of 5 samples
- UW Madison Trial Results:
 - Shredlage™ 31.5-41.5-26.2-.8
 - Conventional KP 5.6-75.6-18.4-.4