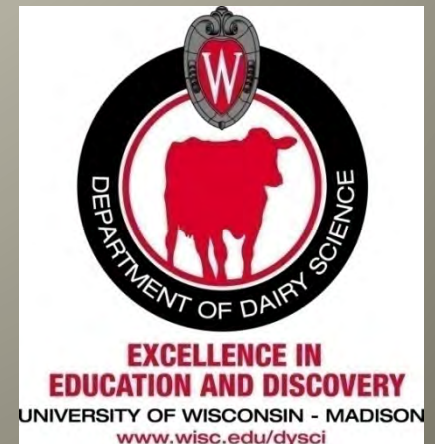
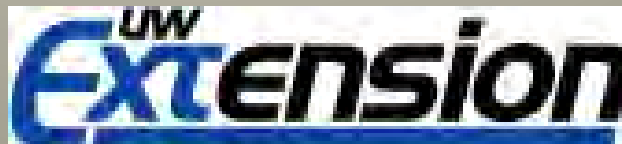


# Update on Corn Shredlage® for Dairy Cattle

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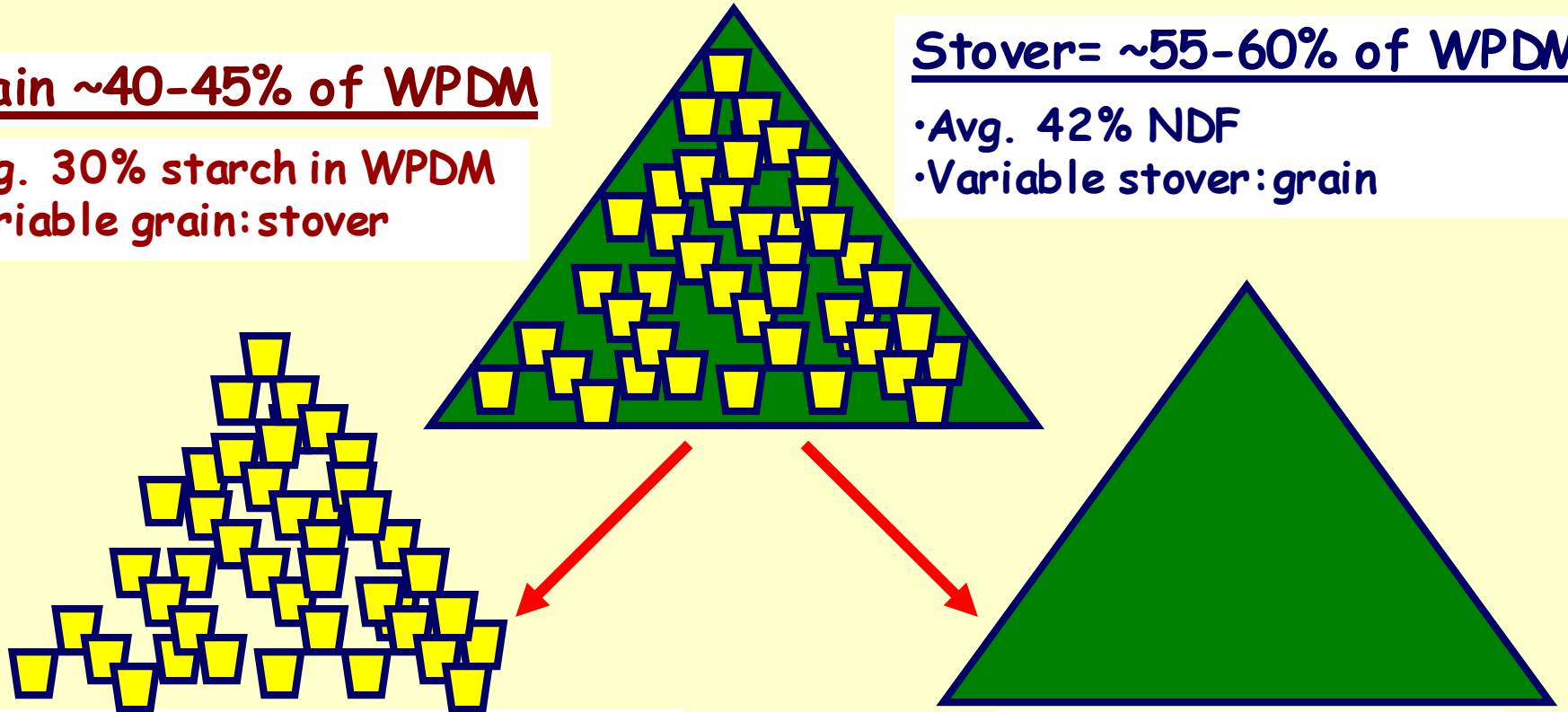
# Whole-Plant Corn Silage

## Grain ~40-45% of WPDM

- Avg. 30% starch in WPDM
- Variable grain:stover

## Stover= ~55-60% of WPDM

- Avg. 42% NDF
- Variable stover:grain



## 80 to 98% StarchD

- Kernel particle size
- Duration of silage fermentation
- Kernel maturity
- Endosperm properties
- Additives

## 40 to 70% IVNDFD

- Lignin/NDF
- Hybrid Type
- Maturity
- Additives

Variable peNDF as per chop length

Corn Shredlage®



Corn Shredlage®

<http://www.shredlage.com/>



Scherer, Tea, SD; <http://scherercorrugating.com/>

# Corn Shredlage®

26-30 mm TLOC; 2-3 mm roll gap





# UW Trial 1 Summary & Conclusions

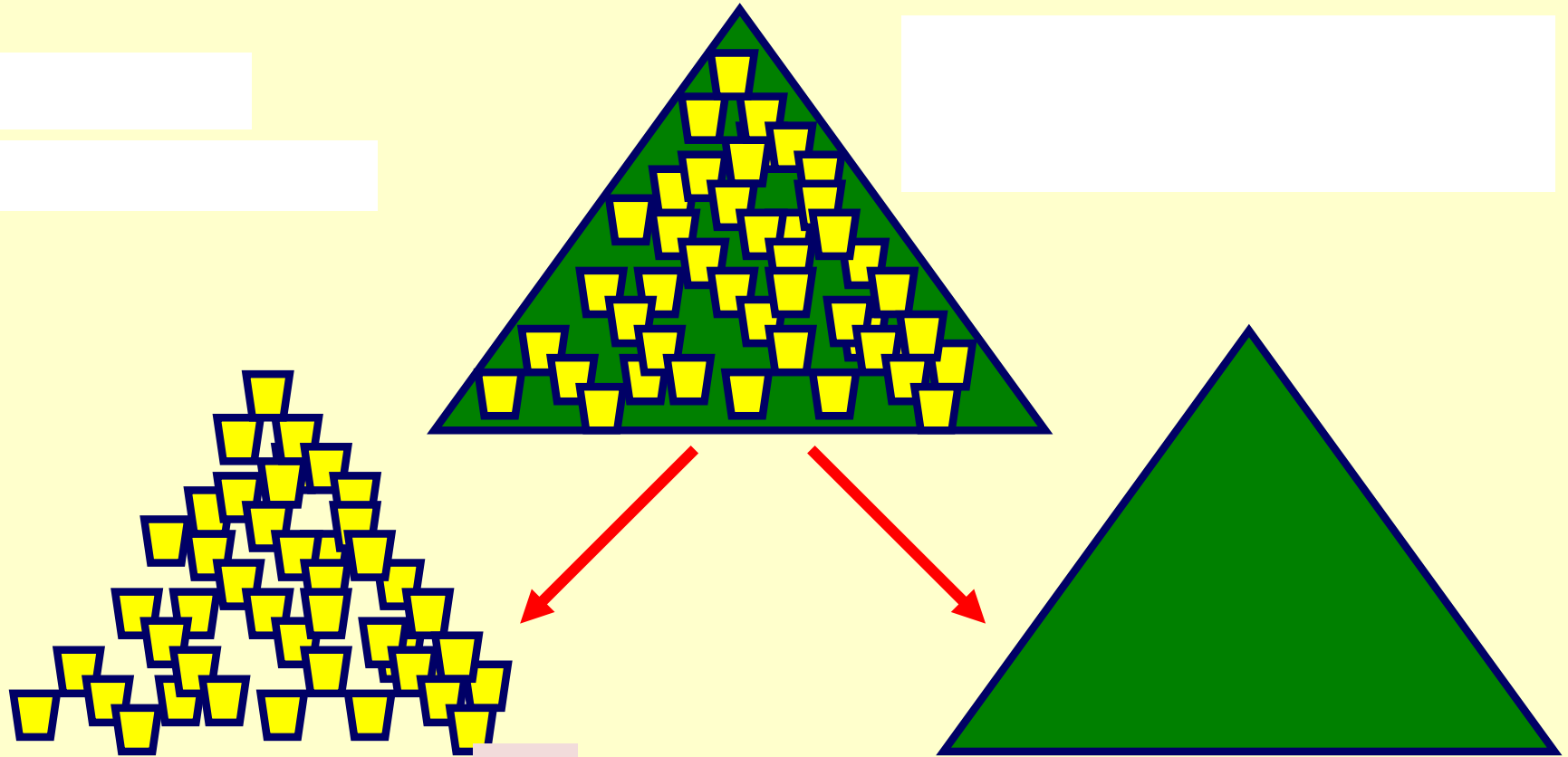
- The proportion top (coarsest) screen of the PSU shaker box greater for Shredlage
  - This was also the case for the Shredlage TMR
    - There was no sorting of either TMR
- DMI tended to be greater for Shredlage
- FCM & ECM tended to be greater Shredlage
  - Response increased as study progressed
- Kernel processing score and ruminal & ttStarchD both greater for Shredlage
- ttNDFD greater for Shredlage TMR
  - Ruminal NDFD response to Shredlage varied by in situ methods
- Similar packing densities in bags and bunker

# Equipment Progression

- Year 1 - ShredP on 3 Claas SPFH
- Year 2 - ShredP on 11 Claas SPFH
- Year 3 - ShredP on 49 mostly Claas SPFH
- Year 4 -  $\approx$ 250 mainly Claas; but roll kits sold for NH, Krone & JD (unsure of TLOC capability)



# Corn Shredlage®



> starch digestibility  
> Kernel damage



> NDFD



> TLOC & peNDF



# UW Trial 2

- Mycogen® F2F627 BMR Silage Corn Hybrid
  - 47 acres planted 5/8/13 at 30,000 seeds per acre on UW Arlington Ag Research Station
  - Harvested at  $\frac{1}{2}$  kernel milkline 9/18/13, treated with Biotal Buchneri 500, & stored in silo bags
- Claas 940 SPFH with Claas conventional processor -- 2 mm roll gap & 19 mm TLOC
- Same SPFH with Scherer Shredlage® processor -- 2 mm roll gap & 26 mm TLOC

# Dry Matter content on feed-out samples

	Shredlage®	KP
DM, % as fed	38.4% ± 3.5	39.0% ± 4.3



# Penn State Shaker Box (as-fed basis)

Samples obtained during feed-out

Screen, mm	Shredlage®	KP	Chopped Hay
19	18.3%	7.1%	20.1%
8	54.5%	68.1%	23.3%
1.18	24.8%	22.3%	31.7%
Pan	2.4%	2.5%	24.9%



# UW Trial 2

- 1/16/14 - 5/8/14; UW - Arlington Dairy
- 15, 8 cow pens; 120 mid lactation cows
- Cows stratified by parity & DIM, assigned to pens, and pens randomly assigned to 1 of 3 TMR treatments
  - **BMR Shredlage®**
  - **Conventional-Processed BMR**
  - **Conventional-Processed BMR plus chopped hay**
- 2-week covariate adjustment period with all pens fed common TMR
- 14-week treatment period with all pens fed their assigned treatment TMR



# 2014 UW Trial 2



Item	BMSHRD	BMKP	BMKPH
<u>Major Ingredients, % of DM</u>			
Corn Silage	---	45.0	35.0
Corn Shredlage®	45.0	---	---
Alfalfa Silage	10.0	10.0	10.0
Chopped Dry Hay	---	---	10.0
Dry Ground Shelled Corn	14.2	14.2	17.7
Soybean Meal, expeller	5.0	5.0	4.2
Soybean Meal, solvent	8.8	8.8	7.7
Corn Gluten Feed, dried	11.1	11.1	9.6
<u>Key Nutrient Targets, % of DM</u>	45	45	45
CP	17	17	17
EE	5	5	5
NDF	32	32	32
Forage NDF	24	24	24
Starch	25	25	25

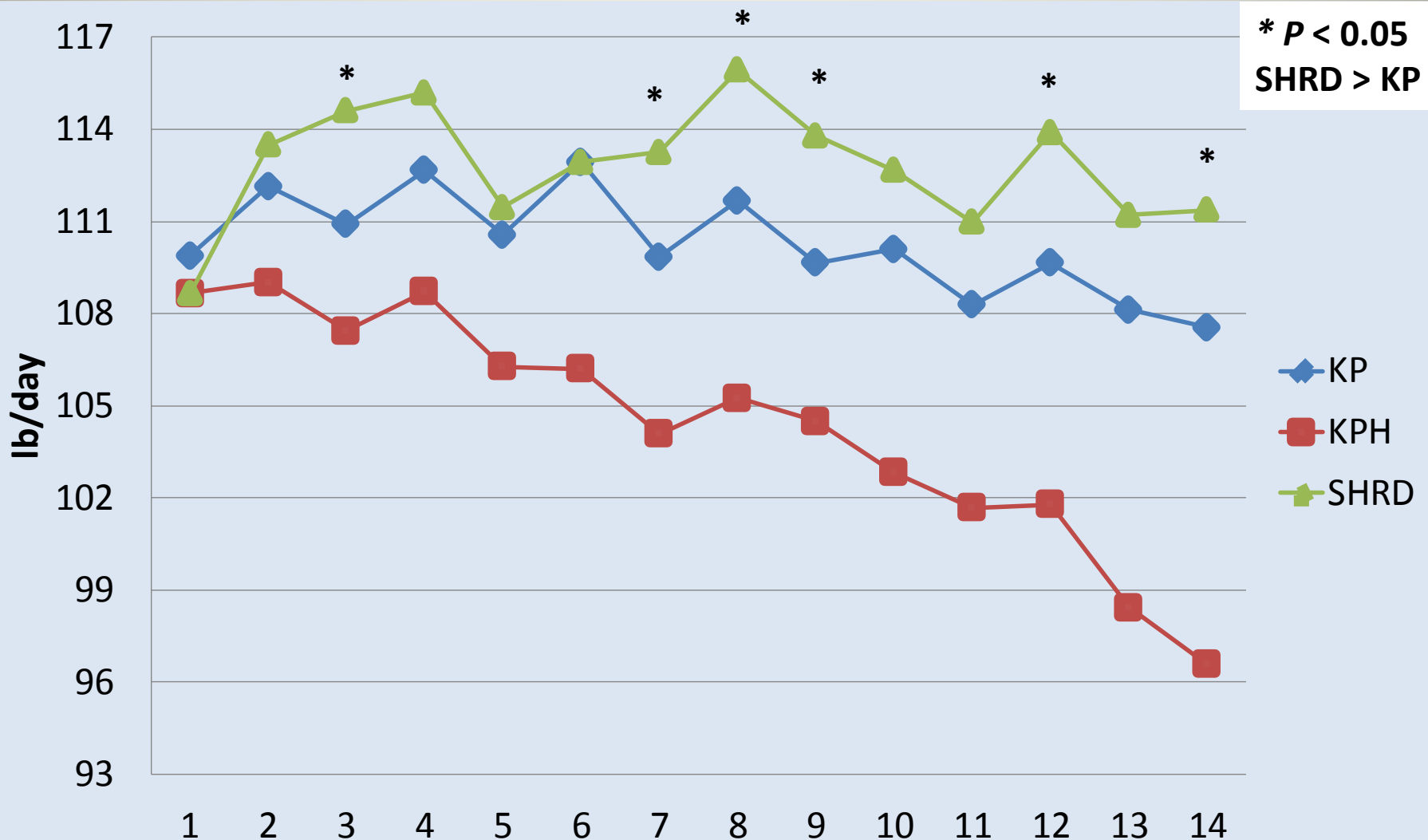
# Dry matter intake & milk yield

	KP	KPH	SHRD	<i>P</i> <
DMI, lb/d	58.8	58.7	59.5	0.72
Milk, lb/d	110.3	104.4	112.8	0.001
Milk/DMI	1.88	1.78	1.89	0.01

- Cows milked 2x
- All cows injected with BST every 14 d starting on d 1 of trial



# Milk Yield by Week on Treatment



Week × Treatment Interaction ( $P < 0.0001$ )

# Rumination Activity

	KP	KPH	SHRD	$P <$
<b>Minutes/day</b>	<b>503</b>	<b>499</b>	<b>504</b>	<b>0.88</b>

# Milk composition

	KP	KPH	SHRD	<i>P</i> <
Fat %	3.31%	3.67%	3.29%	0.01
Protein %	3.13%	3.14%	3.10%	0.22
MUN, mg/dL	14.4	15.3	14.7	0.01

# Milk Component Yields

<u>lb/day</u>	KP	KPH	SHRD	<i>P</i> <
Fat	3.66	3.83	3.71	0.24
Protein	3.44	3.29	3.49	0.05
Lactose	5.38	5.09	5.51	0.001

# May 2014 Economic Calculations

<u>\$/cow/day</u>	KP	KPH	SHRD
Feed Cost	\$7.63	\$7.55	\$7.79
IOFC	\$17.92	\$17.53	\$18.14

- Based on observed treatment DMI, milk & component yields, & TMR ingredient composition.
- Assumed Midwest feed ingredient & milk component prices.
- Included \$2 per as fed ton charge for Shredlage harvest over price of conventional-processed corn silage.

# BCS & BW Change

	KP	KPH	SHRD	<i>P</i> <
BCS	3.09	3.11	3.10	0.88
BWC, lb/d	1.25	0.97	1.43	0.18

# UW Trial 2

- **Measurements in progress**
  - Feed analysis
  - Nutrient intakes
  - Feed sorting
  - Processing score
  - Total tract starch & NDF digestibility
  - Health records

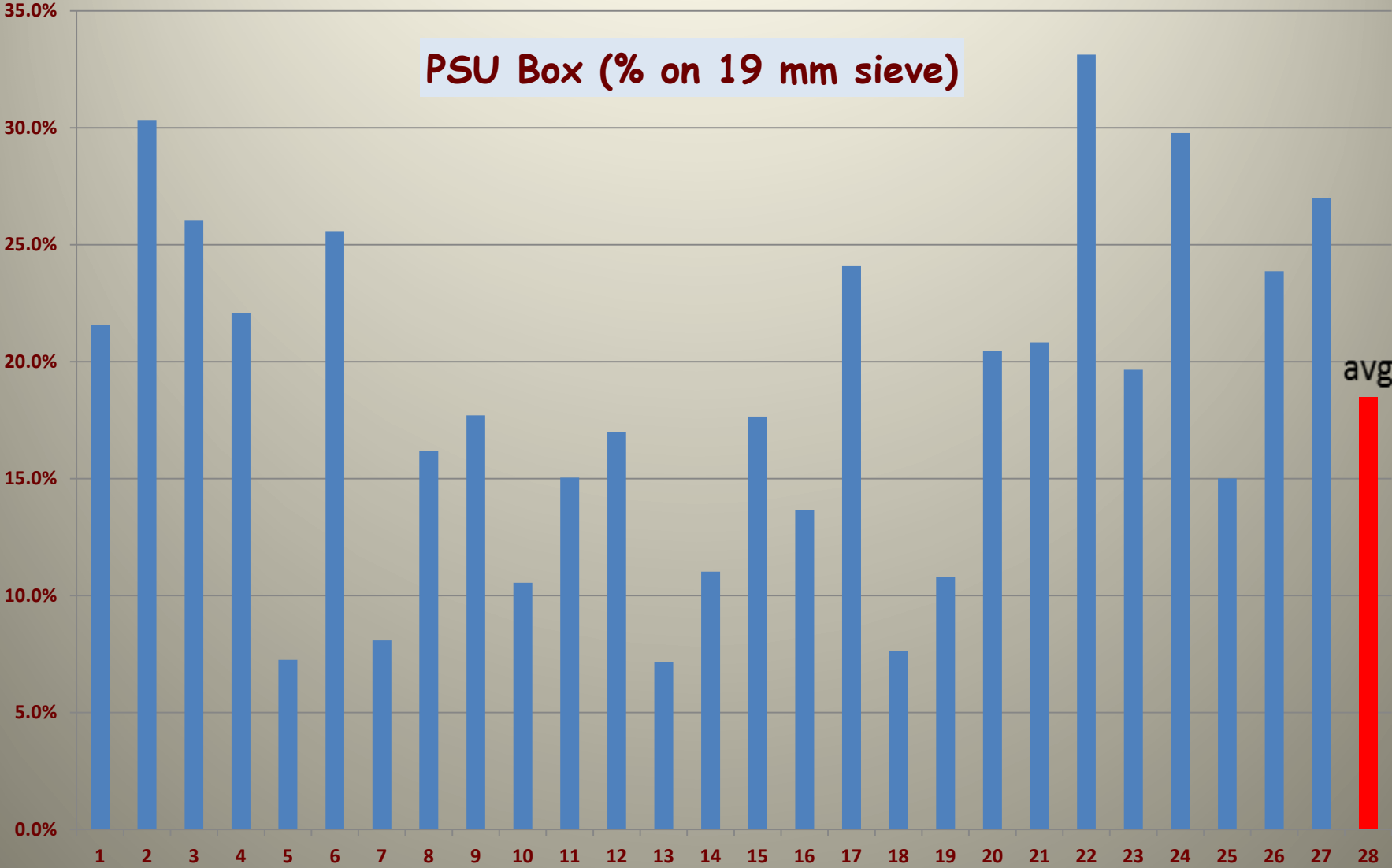
# Equipment Alternatives

- Novel intermeshing disk processors
- Processors with greater roll speed differential
  - Some with rolls reversed
- Unsure of TLOC & MPL or comparability of fiber shredding

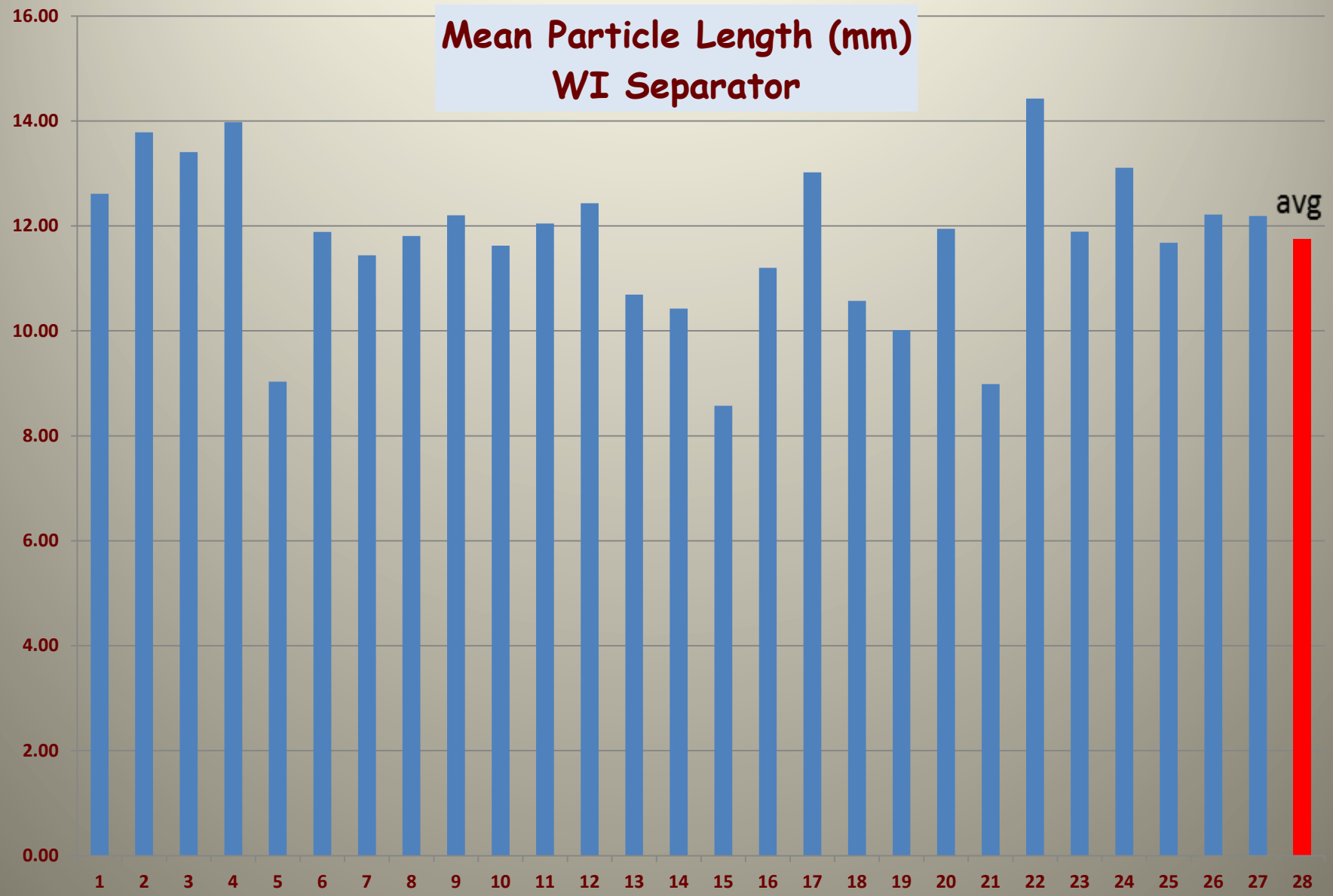


# 2014 WI Field Survey of New-Type-Processed Corn Silage

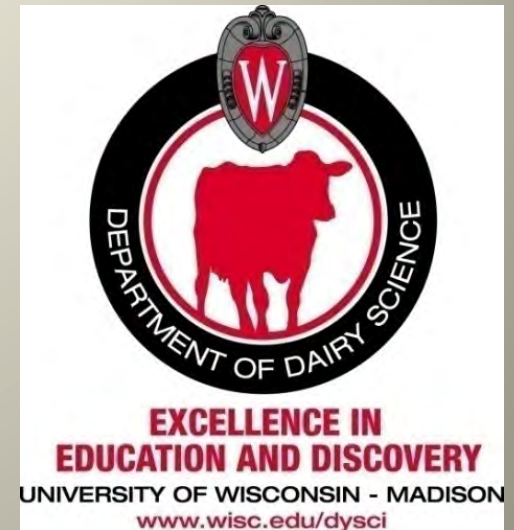
PSU Box (% on 19 mm sieve)



# 2014 WI Field Survey of New-Type-Processed Corn Silage



# Questions?



# Visit UW Extension Dairy Cattle Nutrition Website

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

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### Welcome to Dairy Cattle Nutrition UW-Extension

The Dairy Cattle Nutrition UW-Extension site is designed to provide research-based information for the public seeking resources on applied aspects of the nutrition of dairy cattle.

#### Web Site Highlights

- [Dairy Team News from the University of Wisconsin](#)
- [2009 Four-State Dairy Nutrition & Management Conference Proceedings](#)

#### UW Feed Grain Evaluation System

- [Technical note: A method to quantify prolamin proteins in corn that are negatively related to starch digestibility in ruminants](#) (Josh Larson and Pat Hoffman - JDS paper)
- [Corn Biochemistry: Factors related to starch digestibility in ruminants](#) (Pat Hoffman and Randy Shaver - Conference paper)
- [Corn Biochemistry: Factors related to starch digestibility in ruminants](#) (Pat Hoffman and Randy Shaver - slide set)
- [A guide to understanding prolamins](#) (Pat Hoffman and Randy Shaver)
- [UW Feed Grain Evaluation System](#) (Pat Hoffman and Randy Shaver)
- [Relative Grain Quality - RGQ](#) (Pat Hoffman and Randy Shaver)

#### Spreadsheets

- [MILK2006 Corn Silage: Calculates TDN-1x, NEL-3x, Milk per ton, and Milk per acre](#)

#### Publications

- [Benchmarking forage nutrient composition and digestibility](#)
- [Feeding Programs in High Producing Dairy Herds](#)

#### Presentations

- [Benchmarking forage nutrient composition and digestibility](#)
- [Diets fed in selected WI high-producing dairy herds](#)

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