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Agriculture and Natural Resources

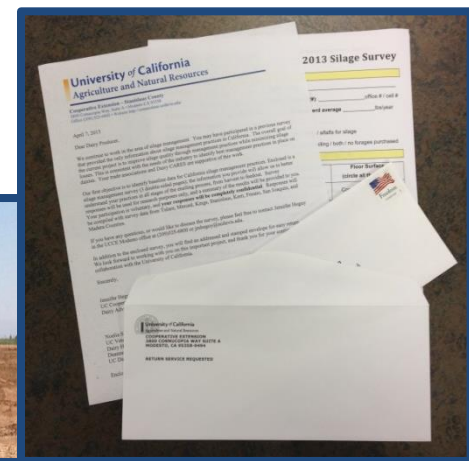
Making a Difference for California

Corn Silage Audits – Lessons from Observing Harvest

Jennifer Heguy – UC Cooperative Extension
Merced, Stanislaus & San Joaquin Counties

2014 Corn Silage Audit

- Dairies selected to participate in this study had previously taken part in a corn silage management survey in 2013.
- Corn silage harvest on 20 San Joaquin Valley dairies were evaluated in the summer of 2014.



Objectives

- To observe ensiling practices,
- To obtain information on current corn ensiling practices, and
- To determine corn silage processing score (CSPS) on harvested forage in the San Joaquin Valley.



2013 Corn Silage Survey

- 138 dairies utilized custom choppers
 - 87% were satisfied with processing
 - 13% felt it needed improvement or was not satisfactory.
- 92.5% of dairies (n=134) reported monitoring kernel processing during harvest.

Custom harvester services:

1. Custom harvesters are utilized for: Corn Winter Cereal Other _____ / Not used

2. How would you rate their performance in the following areas?
1 = Satisfied; 2 = Needs Improvement; 3 = Not Satisfied

Chopping and processing	1	2	3
Harvesting at the right dry matter	1	2	3
Delivery Rate	1	2	3
Packing	1	2	3

3. Have you considered doing your own harvesting? Yes / No



2014 Corn Silage Audit

- Silage structure type, delivery rate, number of packing tractors, and use of a custom chopper were recorded.
- Five consecutive truckloads of delivered fresh chopped forage were sampled and composited.
- Composited samples were sent to a commercial laboratory for nutrient analysis, and analyzed for corn silage processing score (CSPS).

Corn Silage 2014

	Min	Max	Median
Herd Size	350	5,250	1800
	Wedge (n)	Bunker (n)	Drive-over (n)
Structure Type	14	3	3
# Packing Tractors	Delivery Rate (minutes)		
1 (n=12)	8 – 40		
2 (n=7)	10 – 64		
3 (n=1)	22		

2 dairies did not use a custom chopper.



Nutrient composition of chopped corn (n=20)

		% of DM					
	DM	CP	ADF	NDF	Starch	NFC	Ash
AVG	35.9	7.7	24.4	41.0	30.2	43.6	5.4
MEDIAN	35.9	7.8	24.9	42.3	29.0	43.2	5.4
MIN	31.2	6.2	20.2	35.2	23.3	36.6	4.2
MAX	40.3	8.8	28.3	46.7	36.7	50.7	6.8
STD	2.5	0.6	2.1	2.8	3.6	3.1	0.7

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MIN	31.2	6.2	20.2	35.2	23.3	36.6	4.2
MAX	40.3	8.8	28.3	46.7	36.7	50.7	6.8
STD	2.5	0.6	2.1	2.8	3.6	3.1	0.7

Kernel Processing

Kernel Processing Improves:

Handling and Packing
Starch Digestion
Fiber Utilization
Feed Intake
Reduces Feed Sorting



Too Much Processing:

Decreases effective fiber
Favors rapid fermentation ->
rumen acidosis

Too Little Processing:

Kernels lost in feces
Difficult Packing
Sorting increased

Corn Silage Processing Score

What does it measure?

Coarse Fraction > 4.75mm:
Fiber will stimulate chewing activity.
Starch will be poorly digested.

Fine Fraction < 1.18mm:
Fiber may not contribute to chewing activity or physical effectiveness.



**Starch (%) passing through
the coarse screen**

Ranking

> 70%

Optimum

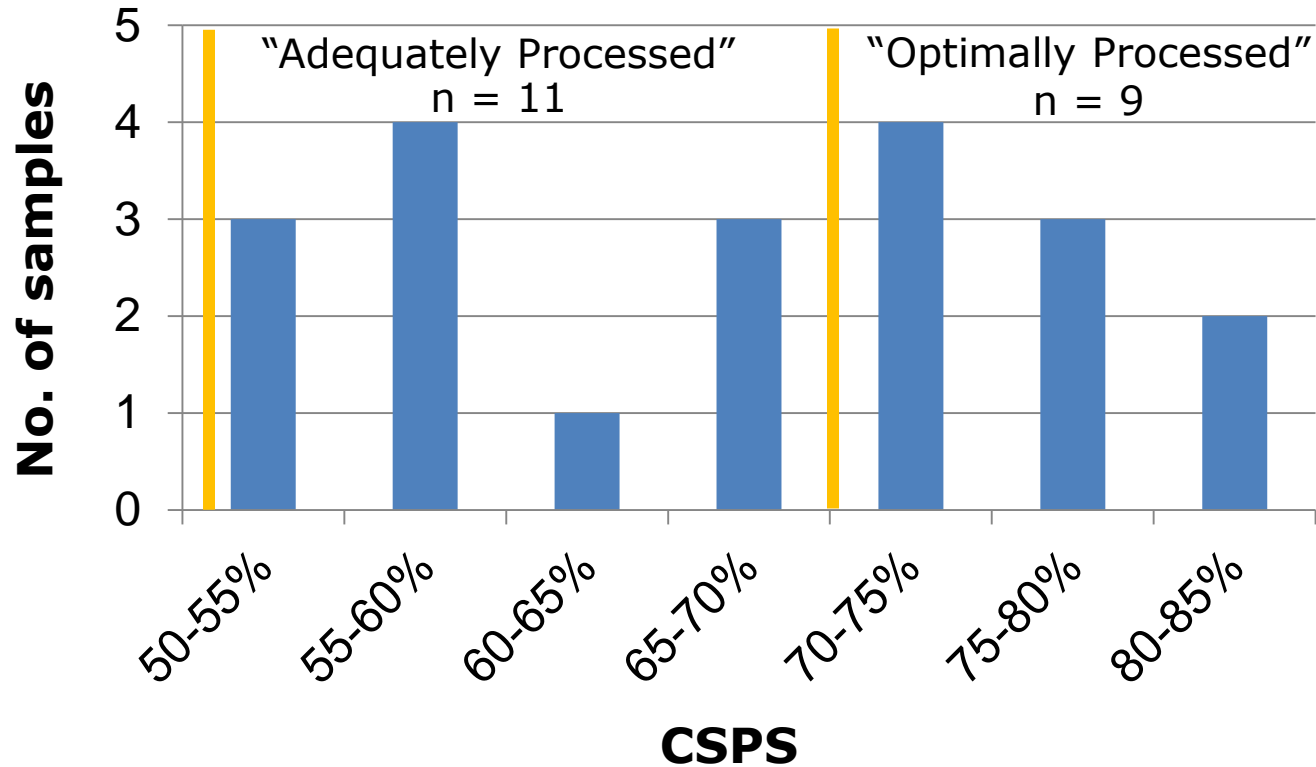
50 -70%

Average

< 50%

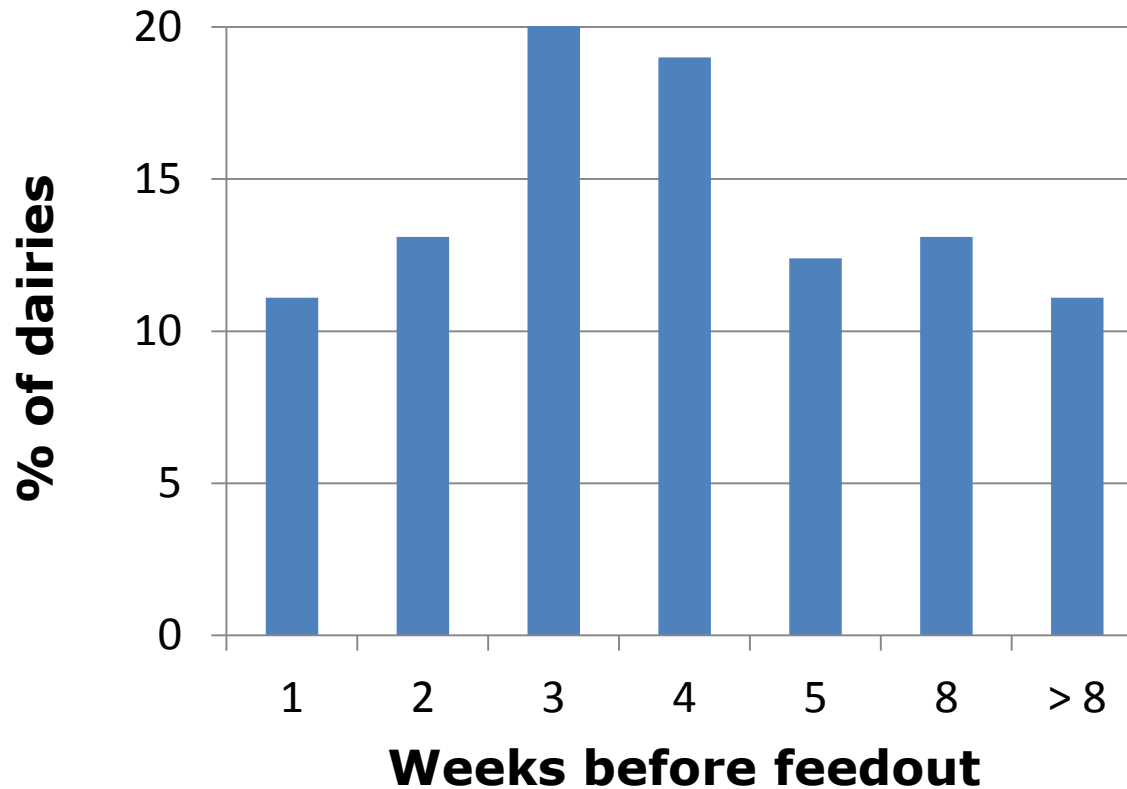
Inadequate Processes

CSPS (n=20)



- No samples were inadequately processed (CSPS <50%)

Time Before Feedout



-
- In the 2013 survey, ~75% reported waiting less than 6 weeks prior to beginning feedout.

On Farm Monitoring

Evaluate the Broken Kernels



Separate kernels in a bucket of water



Guidelines:

- 90 - 95% cracked
- 70% smaller than $\frac{1}{4}$ of a kernel

Nicking and Crushing is not enough

(Mertens, 2005)

Suggested Monitoring

Hourly. Sample a truckload of forage for:

1. DM

2. Length of cut

3. Kernel Processing

- Checking the degree of kernel processing on-farm, throughout harvest, will allow for improvements in kernel processing.
- Due to the large range in CSPS observed, hourly inspection of the delivered material and open communication with the chopper to meet harvesting goals is recommended.





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Thank You!

Jennifer Heguy

Farm Advisor - Merced, Stanislaus &
San Joaquin Counties

jmheguy@ucdavis.edu

(209)525-6800

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