

Does Your Forage Have a Story to Tell?

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Vita Plus Corp.



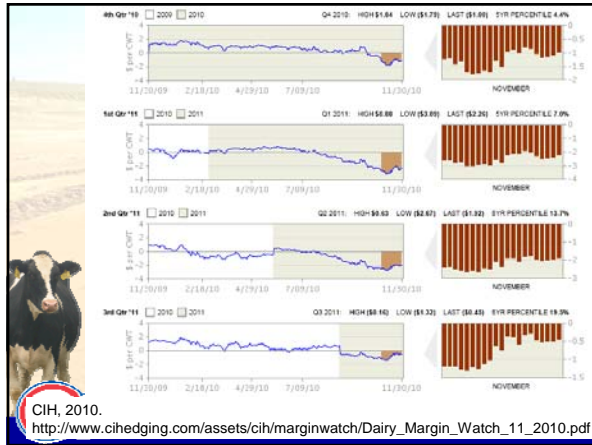
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Today's Aim

- Margins – forage related
- We strive for exceptional feed
 - ½ the battle
- Strive for consistent, high quality feed all year long
 - Other ½ the battle
 - Today's focus



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The End of the Story

Rock River Laboratory, Inc.
P.O. Box 169
Watertown, WI 53094-0169
920.261.0446


Feed-Value Report
RIVERDALE FEED AND GRAIN (VP) 1532
PO BOX 45
RIVERDALE, MI 48877
989.833.7757

Representative:
ANNETTE ZWALD

FEED NAME: 1st haylage (1C) ANALYSIS TYPE: FORAGE CHECK

Moisture	%	51.72%		
Dry Matter	%	48.28%		
pH		5.13		
			Dry Basis	Average
Crude Protein	%DM	24.89%	20.03	15.55 - 24.51
Available Crude Protein	%DM	24.89%		
ADF	%DM	25.89%	32.40	26.58 - 38.22
aNDF (w/ Na2SO3)	%DM	29.26%	41.30	33.16 - 49.44
Lignin (Sulfuric Acid)	%DM	7.14%	8.06	5.98 - 10.14
Lignin	%NDF	24.41%		
NDFD 30 (1mm)	%NDF	55.67%	50.15	37.05 - 63.25
IVTDMD 30	%DM	87.03%	77.07	66.36 - 87.79


Diets: from 50 to 60% forage...
\$0.73/cow/day less expensive diet!



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High Quality Feeds

	185 RFV	125 RFV	Hi Qual Silage	Conv Silage
CP	23	20	8	20
NDF	36	45	38	41
TDN	70	63	74	68
NE-L	0.72	0.60	0.78	0.72
NDFd	+10	-2	+5	-




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Quick Diet Comparison for \$0.70

	HiQual Forage Diet	LoQual Forage Diet
Corn Silage	48 lbs	40 lbs
Haylage	40 lbs	33 lbs
Corn	10 lbs	15 lbs
SBM/Soy Plus	3 lbs	4 lbs

HiQual Forage Diet	LoQual Forage Diet
Forage NDF: 21.5	Forage NDF: 21
Starch: 24	Starch 27
Forage/Conc: 58/42	Forage/Conc: 48/52
Milk Production: 90 lbs	




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Where Rubber Hits the Road

\$/Ton		\$/hd/d	\$/hd/d
200.00	Corn, Ground	1.04	1.52
50.00	Wet Dist	.25	.25
170.00	Soy Hulls	.47	.47
352.00	SBM 47.0%	.28	.76
805.00	Blood	.22	.22
598.00	UREA 46%	.03	.03
401.00	Soy Plus	.34	.34
Ration Cost, \$/hd/Day		3.16	3.83

This is possible by maintaining high quality feeds and we can diagnose your maintenance...



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Chapters in Your Forage Story

Introduction: Margins!

4. The End


- Forage Density
- Fermentation Analyses & Microbial Counts
- Forage Core and Surface Temperatures



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Forage Density

- One of first diagnostic tools
- Technique
 - Drill holes & calculate weight per volume
- Ruppel (1992) first related density to quality (losses)
 - 20% loss with poor density
 - Double density? 10% forage shrink
- Muck & Holmes (2000) rec. 14lbs DM/ft³




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Forage Density

- Visser & Team led the field in 2005
- Surveyed over 100 farms

	Haylage		Corn Silage	
	Average	Range	Average	Range
-----lbs DM/ft-----				
Bunker	15.9	9.9 - 27.2	12.1	6.4 - 23.6
Pile	13.7	8.2 - 22.9	11	4.9 - 18.7
Bag	11.9	6.4 - 19.9	8.4	4.3 - 12.6




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Forage Density

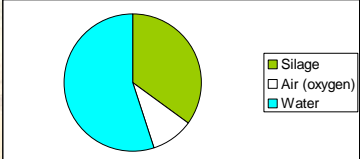
- We have continued to benchmark

Year	States	Average Density
2005	IN/OH/MI	19.4
2006	IN/OH/MI	17.3
2008	IN/OH/MI	18.6
2009	IN/OH/MI	17.1
2010	MI	16.9




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Forage Density: Porosity



- Muck & Holmes now rec. **As-Fed** density
 - **Porosity** = actual gas filled space in silo
 - As-fed density better predicts
- **Goal = 44lbs silage (wet) / ft³**



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How do we get better?

- Tractor weight / 800 = Tons per hr capability
 - E.g. 60,000 / 800 = 75 tons per hr can be packed right
- Thin layers
 - 2 to 6" each push
- Right moisture
 - Moisture excludes air


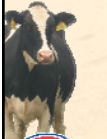



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Fermentation Analyses




I'M TRIPPING ON LACTIC ACID


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- Measure Volatile Fatty Acids (VFA)
 - Bacteria produce acids
 - Lactic acid
 - pH driver
 - Acetic Acid
 - Alternative end product
 - Can indicate inefficient ferment
 - Butyric acid
 - Negative end product, Stinks!
 - Tells us we've got big problems
- Ammonia-N (% of CP) – focus of new research
 - How much CP was broken down?




Fermentation Analysis Goals

- pH < 4.0 silage & < 4.5 haylages
- Lactic Acid
 - >3.0%
- Acetic Acid
 - <2.0%
 - Except when using *Buchneri* inoculants
- Butyric Acid
 - <0.1%
- NH₃-N
 - <10% of CP

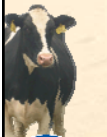



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Microbial Counts



- Add-on to fermentation analysis
- Yeasts & Molds
 - Capable of rapidly growing (double each hr)
 - E.g. 100,000 cfu/g TMR at breakfast = 32,000,000 by lunch
- Goals
 - Yeast < 100,000 cfu / gram forage out of silo
 - Mold < 10,000 cfu / gram

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Goal: Efficient Fermentation

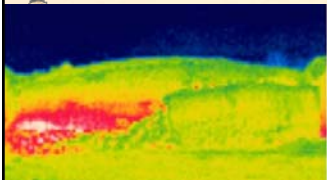

- Harvest high quality forage
 - <40% NDF
 - Give the bugs some food to ferment
- Use proven microbial inoculant
 - Efficient ferment can preserve additional 30lbs protein per ton forage
- Seal silo as fast as possible
 - Two plastic layers
 - Physical & oxygen barriers
 - Edges & face
 - Tires/sand



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New Forage Diagnostic: Forage Temperature Analysis

- Core Temps
 - Probe and thermocouple
- Surface Temps
 - Thermal images (Infrared camera)

Forage Temp Background


- Higher forage temps related to spoilage
 - Ruppel (1995)
 - Tobacco & Borreani (2010)
 - Temp 10 degree higher "core temp" = higher yeast, mold & spoilage
 - 8" deep, not true surface measure & difficult to repeat
- Limited core/surface data from the field
 - Visser (2005)



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Forage Temp Background

- Core forage temp determined by
 - Ambient temp at harvest
 - Fermentation efficiency
 - Forage stability
- Temps > 95 F likely cause forage damage
 - (Kung, personal communication)
 - Protein breakdown & caramelization

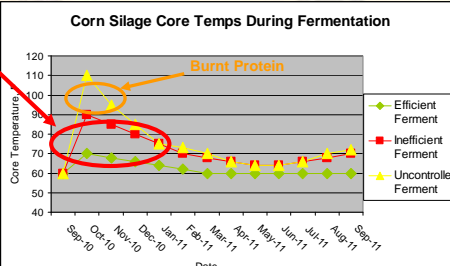



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Forage Temp Background

- "Normal" fermentations cause temp increase of 10-15 degrees
 - Then cool back to harvest air temp


Bugs continue burning sugars & easily digestible DM

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2010 Goeser & Heuer Research


- 50+ farms
 - 46 during both Winter & Summer
- 100+ bunkers
 - 44 CS, 33 Hlg, & 9 HMSC included in analysis
- Infrared camera & thermocouple measures
 - True surface & core measures



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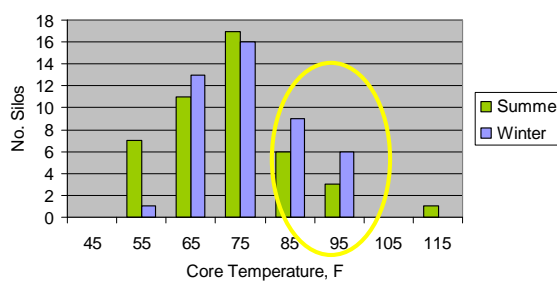

Core Temp Results

Crop / Season	Left Zone	Center Zone	Right Zone	Center-Edge Range
CS Summer	69.8	67.8	71.5	-2.7
CS Winter	67.0	71.8	66.7	5.0
HLG Summer	80.4	81.8	81.0	1.1
HLG Winter	70.1	76.7	70.7	6.3
HMSC Summer	62.4	57.7	62.8	-4.9
HMSC Winter	56.4	63.3	59.6	5.3

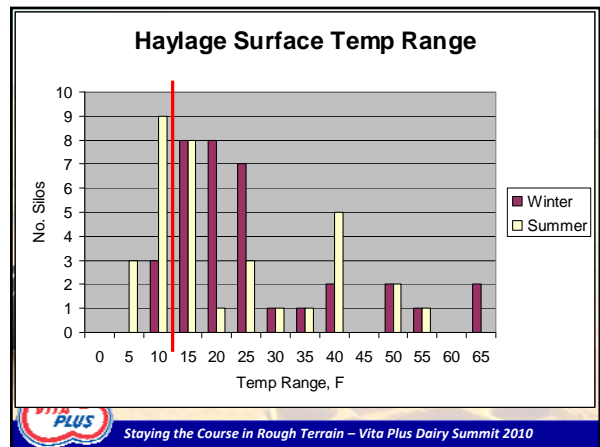
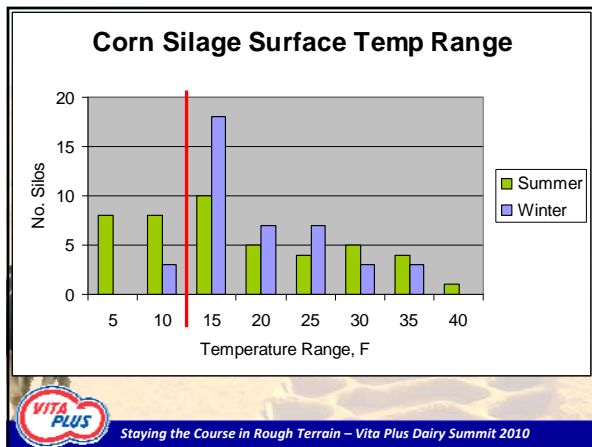
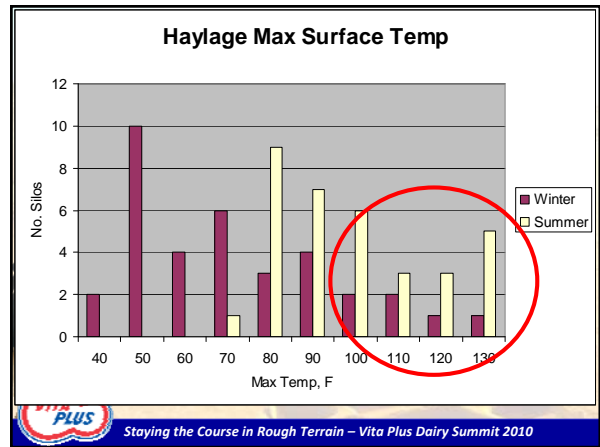
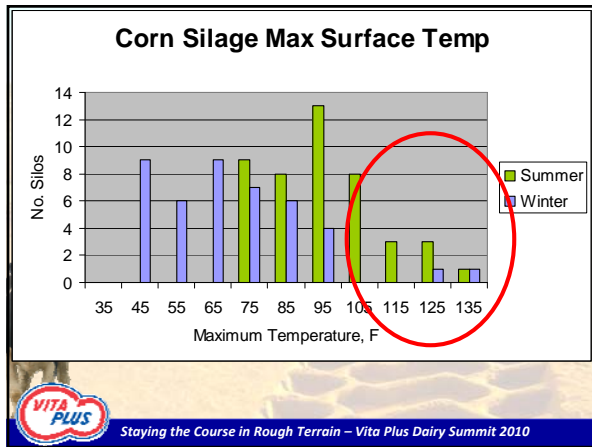
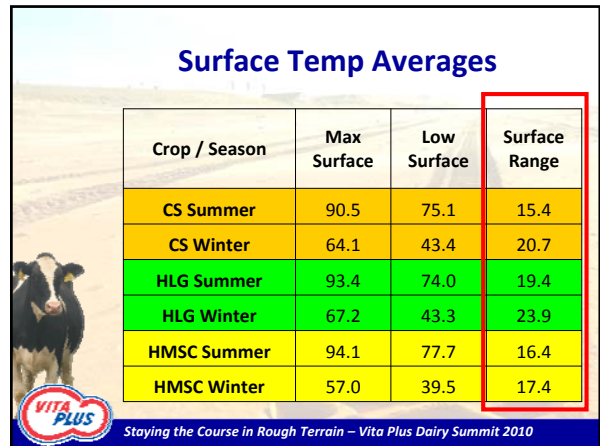
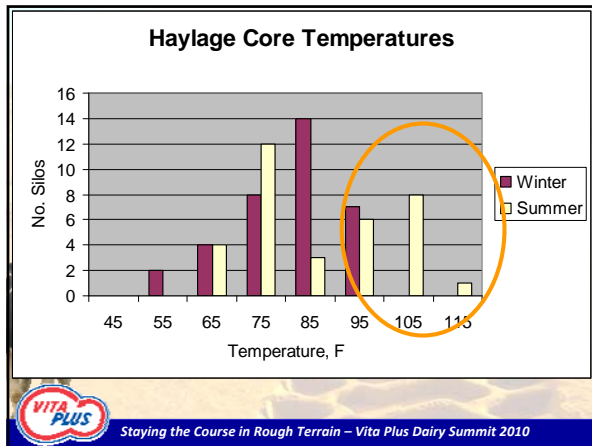


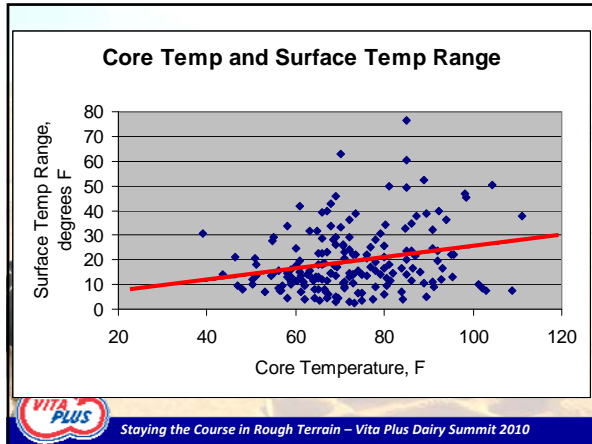
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Corn Silage Core Temp

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Vita Plus Detailed Forage Temperature Analysis

After 100+ bunkers, what I'm key in on:

- IR Image consistency
- Core temp max
 - Core difference from edges
- Surface Max
 - Surface Range

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Example Report

Description: 2009 Corn Silage

	Core Measures			Surface Measures			
	Obs.	Survey Avg	Study Avg	Obs.	Survey Avg	Study Avg	
Left	55	67	67	Max	75.6	75.1	62.5
Center	60	69	71	Min	58.1	54.7	70.8
Right	62	64	67	Range	17.5	20.4	21.8
Range	7	10	12				

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Example Report

Description: 2009 Corn Silage

	Core Measures			Surface Measures			
	Obs.	Survey Avg	Study Avg	Obs.	Survey Avg	Study Avg	
Left	70	67	67	Max	71.5	75.1	62.5
Center	69	69	71	Min	42.4	54.7	70.8
Right	69	64	67	Range	29.1	20.4	21.8
Range	1	10	12				

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Thanks for Joining Us!

Comments & Questions?

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