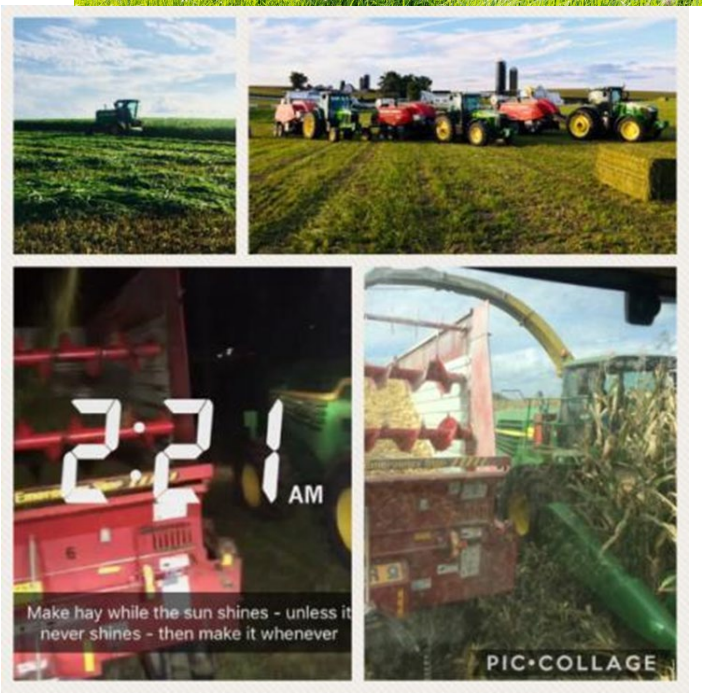
Small Grain Silage as a Feed Source for a Dairy Farm: How to Make It Work

Operation Overview

- Milking 550 cows Organically
  - Housed in freestall barns
  - Holstein, Jersey, Brown Swiss, and many crossbreds
- As a family we run about 1800 acres
  - 1400 crops
    - Alfalfa/grass hay, Corn, small grain forages, annual cocktail mixes
  - 430 pasture



Why we grow small grains for forage

- Fits into our crop rotation well
- Keeps soil covered
- Helps keep ration cost down

Small Grains We Utilize

- Winter Wheat
- Triticale
  - Winter& spring seeded
- Winter Rye/ Italian Ryegrass
- Oats
- Sorghum/Sudan

Winter Wheat

- Pros
  - Great winter hardiness
  - Easy to kill off for next crop
  - Can easily be grazed/chopped
  - Slow to maturity
- Cons
  - Lower yield potential
  - Needs to be in early
- Use in Rotation
  - Heaviest use on last year transitional ground
  - Establishing contour strips

Oats

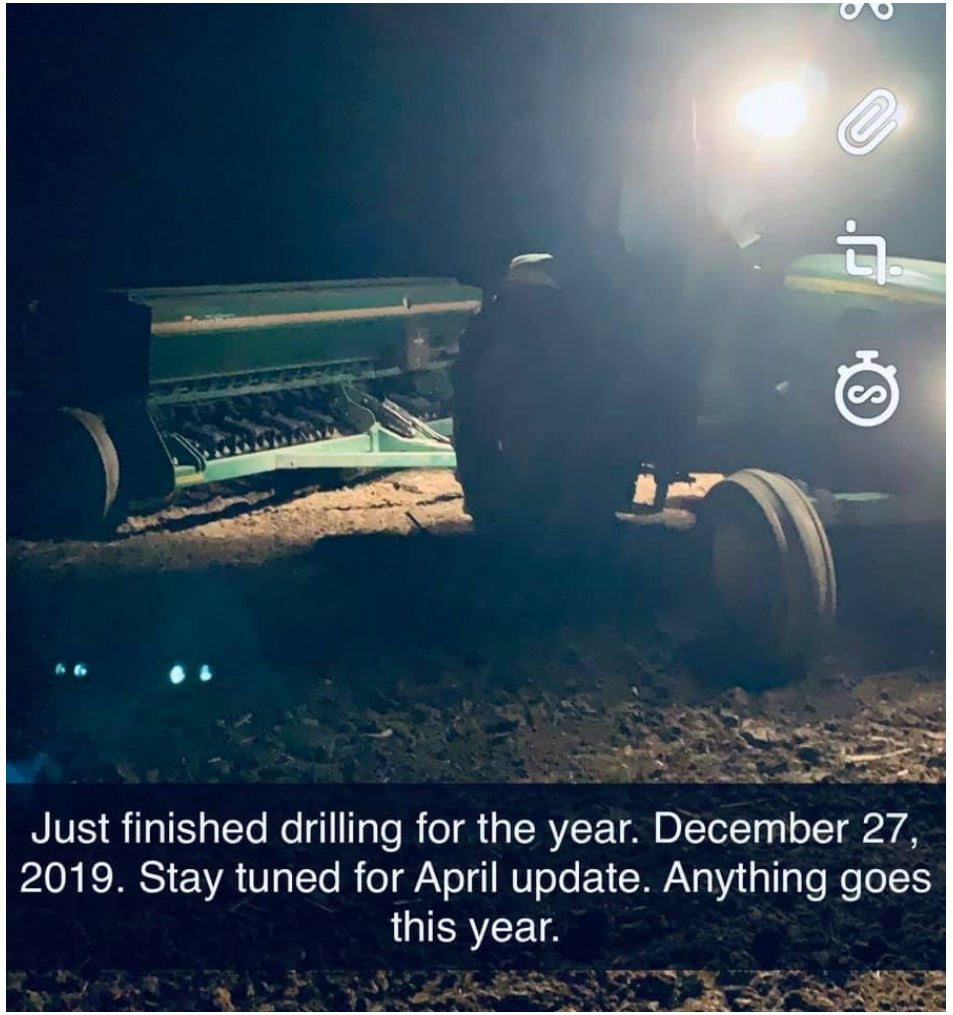
- Pros
  - Most early season forage growth
  - Easily established anytime of year
  - Quick growing
- Cons
  - Limited yield potential
  - Not winter hardy
- Use in Rotation
  - Nurse crop
  - Patching areas of overrun pasture
  - If need to grow some forage quickly before winter, can be best option

Winter/Spring Triticale

- Pros
  - High quality potential
  - Good yield potential
- Cons
  - Winter triticale yield heavily depends on fall tillering
- Use in Rotation
  - Go to fall seed if corn silage off in time
  - Spring seed as nurse crop for alfalfa seeding

Winter Rye

- Pros
  - Get it in the ground it will grow
  - High yield potential
  - Forms great sod, good weed suppression
- Cons
  - Difficult to kill off without chemicals
  - Can have a quality downside
- Use in Rotation
  - After corn



Sorghum or Sorghum-Sudan grass

- Pros
  - High yield potential
  - High quality potential
  - Great weed suppression
- Cons
  - Likes dry feet and hot summers
  - Quality can escape due to rapid growth
- Use in Rotation
  - Break up need for corn on corn
  - Cover crop before fall seeded alfalfa

“Persistence and resilience only come from having been given the chance to work through difficult problems.”

— Gever Tulley

Why our Crop Rotations have evolved

- Ability to grow lots of high-quality forages
  - High amount of digestible fiber
  - Wasn’t satisfied with rations of corn silage & alfalfa
- Ability to grow lots of corn consistently & cheaply
  - Lots of green manure
- Weed control

How we started

- Corn
- Seeding
- Hay
- Hay
- Hay
- Wash, Rinse, Repeat

Splitting Land Base into a few rotations

Ground we can hose manure on

- Corn
- Winter Triticale or Rye
- Cocktail mixes
- Keep in rotation until weed pressure picks up

Farther Ground

- Basically old rotation
- Using Winter Wheat/ PS SS instead of corn on poorer ground
- Foraging our nurse/cover crops

5-year average per acre

Crop	Tons DM		Crop	Tons DM
Corn Silage	7.5		Corn	7.5
Seeding year	2.5		Rye/SS	6.5
1rst hay	4.5		Corn	7.5
2nd hay	4		Rye/SS	6.5
3rd hay	3.75		Corn	7.5
Total	22.25		Total	35.5

13.25 tons per acre over 5 years

Harvesting

- Simplest for us to cut, merge, chop
- Cut height typically about 3inches
- Can easily be baled and wrapped
- Quality vs quantity
  - Weather
  - Maturity

So we grew all this random forage… Now what do we do with it?

TABLE 1 Nutrient composition of small-grain silages compared to corn and alfalfa silage (NRC, 2001)

	DM[1]	CP[2]	NDF[3]	ADF[4]	Lignin	Ash
Corn	35.1	8.8	45.0	28.1	2.6	4.3
Alfalfa	42.9	21.9	43.2	35.2	7.3	10.8
Wheat	33.3	12.0	59.9	37.6	5.8	8.6
Oat	34.6	12.9	60.6	38.9	5.5	9.8
Rye	29.7	16.1	57.8	34.9	4.5	9.6
Triticale	32.0	13.8	59.7	39.6	5.8	9.7
Barley	35.5	12.0	56.3	34.5	5.6	7.5

[1]Dry matter [2]Crude protein [3]Neutral detergent fiber [4]Acid detergent fiber

Match silages with correct animal groups

- Lactating Cows
  - Typically need to be harvest boot to late boot stage
    - Possibly a way to feed some at milk stage
  - Replacement for CS or Haylage?
- Heifers
  - Heading-Milk stage
  - Can make up almost all of rations if harvested correctly
- Dry Cows
  - I typically avoid spring harvested
  - Case for wheat silage at the milk to dough stage

Sample #	trit and peas 2014, Bag, 1st Crop		
Lab # 933252	**Sampled on** 8/28/2014	**Received on** 8/28/2014	
Farm tranel farms			

Moisture 57.57% **Dry Matter** 42.43%

Description (%DM unless specified)	Dry Matter Basis	60 Day / 4 yr Averages
Crude Protein	19.04%	13.6 / 13.2
% Protein Solubility %CP	52.73%	
Avail. Crude Protein	18.32%	
ADF Bound Protein	0.72%	0.76 / 0.85
ADICP %CP	3.78%	
Acid Det. Fiber	29.14%	37.5 / 37.6
aNDF (w/NaSO3)	37.73%	54.4 / 55.3
Calcium	0.73%	0.50 / 0.48
Phosphorus	0.36%	0.31 / 0.31
Magnesium	0.35%	0.22 / 0.19
Potassium	3.02%	2.45 / 2.70
Sulfur	0.21%	0.18 / 0.18
Fat (EE)	3.31%	2.67 / 2.62
Ash	12.26%	9.75 / 10.3
Lignin	3.82%	4.68 / 4.59
Lignin (calc. using 120h uNDF)	3.82%	
Sugar	1.42%	3.62 / 4.94
NDICP	0.92%	
Starch	7.86%	5.53 / 6.18
Fermentation Products		
Lactic Acid	7.75	
Acetic Acid	1.52	
Butyric Acid	0.45	
Total VFA	9.72	
Ammonia-N Crude Protein Equivalent	1.55	
Ammonia-N % of Crude Protein	8.16	
pH	4.20	
NDF Digest. (% of NDF): Traditional=Goering & Van Soest Method, Standardized=Combs-Goeser Method		
Traditional 48HR	65.78%	64.0 / 67.5
Traditional 30HR	67.19%	58.4 / 55.6
Standardized 24HR	31.75%	21.8 / 32.7
Standardized 30HR	41.85%	30.0 / 40.9
Standardized 48HR	62.63%	47.7 / 58.8
NDFD 120HR	100.00%	
Calculations		
TTNDFD	55.23	46.2 / 49.3
Deviation from 4 yr avg TTNDFD	5.90	
Relative Forage Quality	179	
Dynamic NDF Kd (using 24,30,48 hr)	6.84%/hr	4.62
Relative feed value	163	
N.F.C.	28.58%	
Milk 2006 Energy calculated using avg of 30 & 48h Std NDFD, compared to lab avg = 44.505		
TDN maintenance	63.20%	
NEL 3x maintenance Mcal/lb	0.67	
Net energy of gain Mcal/lb	0.41	
Net energy maintenance Mcal/lb	0.67	
Lbs. Milk/Ton	3057	
Milk 2006 Energy calculated using avg of 30 & 48h Trad NDFD, compared to lab avg = 59.505		
TDN maintenance	62.26%	
NEL 3x maintenance Mcal/lb	0.67	
Net energy of gain Mcal/lb	0.39	
Net energy maintenance Mcal/lb	0.66	
Lbs. Milk/Ton	3154	

*ND - None Detected

For Rock River Lab Analysis Guidelines, please visit http://www.rockriverlab.com

TRIT/PEAS 2017 2018
Tranel Family Farm

Dry Matter 29.28%
Moisture 70.72%

Description (%DM unless specified)	Dry Matter Basis	Small grains forage (Silage) 60 dy Avg	Small grains forage (Silage) 4 yr Avg
Crude Protein	19.84	14.02	13.40
Soluble Protein, %CP	71.89		53.44
ADICP	0.58	0.64	0.85
NDICP	1.03		1.65
ADF	35.08	38.20	
aNDF	50.62	55.91	54.73
aNDFom	46.17	52.35	51.34
Calcium	0.47	0.50	0.49
Phosphorus	0.45	0.32	
Magnesium	0.20	0.21	
Potassium	3.82	2.67	2.64
Sulfur	0.24	0.21	0.18
Fat (EE)	4.00	3.00	2.63
Ash	11.33	11.89	10.23
Lignin	3.95	4.74	4.63
Sugar (ESC)	2.03	2.62	4.66
Sugar (WSC)	2.13		5.60
Starch	0.27	2.87	8.19
Fermentation Products			
Lactic Acid	5.47	3.78	4.11
Acetic Acid	2.51	1.44	1.84
Butyric Acid	0.57	0.59	0.22
Ammonia-N CP Equivalent	2.53	1.58	
Ammonia-N, %CP	12.77	11.29	15.61
pH	4.71		4.56
Fermentation DM Loss**	4.26		3.94
CNCPS Inputs			
NDFD 30, %NDF	67.51	49.53	56.29
NDFD 120, %NDF	83.66	67.35	51.14
NDFD 240, %NDF	83.94		
uNDF30	16.45		
uNDF240	8.13		
tNDFD30om %aNDFom	69.68		
tNDFD120om %aNDFom	85.97		
tNDFD240om %aNDFom	86.25		
uNDF120om	6.48		
uNDF240om	6.35		
uNDF30om	14.00		
Calculations			
TTNDFD, %NDF	56.94	44.19	44.30
TTNDFD Deviation, %NDF	12.64		
RFQ	176		
NFC	15.25		
RFV	113		
Dynamic NDF Kd (using 24,30,48,240 hr) %/hr	5.94	5.52	5.28
Milk 2006 Energy calculated using 30h Trad NDFD			
TDN 1X	59.70		
NEL 3x, Mcal/lb	0.624		
NEG, Mcal/lb	0.349		
NEM, Mcal/lb	0.610		

Account: B & L AGRI SERVICE

Completed: **06/08/2018**
Reported: **06/08/2018**

TRITICALE

SAMPLE INFORMATION

Lab ID:	24254 056	Version:	1.0
Crop Year:	2018	Series:	
Feed Type:	TRITICALE FORAGE	Cutting#:	
Package:	BASIC NIR		

NIR ANALYSIS RESULTS

Moisture	72.2
Dry Matter	27.8

PROTEINS	% SP	% CP	% DM
Crude Protein			17.2
Adjusted Protein			
Soluble Protein		80.2	13.8
Ammonia (CPE)	16.8	13.5	2.32
ADF Protein (ADICP)		3.5	0.61
NDF Protein (NDICP)		5.2	0.90
NDR Protein (NDRCP)			
Rumen Degr. Protein		90.1	15.5
Rumen Deg. CP (Strep.G)			

FIBER	%NDFom	NDFom %DM	% NDF	% DM
ADF			65.4	31.7
aNDF		46.6		48.5
NDR (NDF w/o sulfite)				
peNDF				
Crude Fiber				
Lignin			5.32	2.58
NDF Digestibility (12 hr)				
NDF Digestibility (24 hr)				
NDF Digestibility (30 hr)	72.8	33.9	69.9	33.9
NDF Digestibility (48 hr)				
NDF Digestibility (120 hr)	76.7	35.7	73.5	35.7
NDF Digestibility (240 hr)	79.0	36.8	75.8	36.8
uNDF (30 hr)	27.2	12.7	30.1	14.6
uNDF (120 hr)	23.3	10.9	26.5	12.8
uNDF (240 hr)	21.0	9.8	24.2	11.7

CARBOHYDRATES	% Starch	% NFC	% DM
Silage Acids		66.6	11.9
Ethanol Soluble CHO (Sugar)		10.3	1.9
Water Soluble CHO (Sugar)			
Starch		8.4	1.5
Soluble Fiber		36.0	6.45
Starch Dig. (7 hr, 4 mm)			
Fatty Acids, Total			2.03
Fatty Acids (%Fat)			49.4
Crude Fat			4.11

Values in bold were analyzed by wet chemistry methods.

Definitions and explanation of report terms

MINERALS

Ash (%DM)	13.2
Calcium (%DM)	0.40
Phosphorus (%DM)	0.45
Magnesium (%DM)	0.17
Potassium (%DM)	4.36
Sulfur (%DM)	0.27
Sodium (%DM)	
Chloride (%DM)	
Iron (PPM)	
Manganese (PPM)	
Zinc (PPM)	
Copper (PPM)	
Nitrate Ion (%DM)	
Selenium (PPM)	
Molybdenum (PPM)	

QUALITATIVE

Total VFA (%DM)	11.92
Lactic Acid (%DM)	7.76
Lactic as % of Total VFA	65
Acetic Acid (%DM)	3.20
Butyric Acid (%DM)	0.96
1, 2 Propanediol (%DM)	

Soil Contamination Probability	Probable moderate contamination
Nitrate Probability	
NIR Statistical Confidence	Good prediction potential

ENERGY & INDEX CALCULATIONS

pH	4.25
TDN (%DM)	63.7
Net Energy Lactation (Mcal/lb)	0.66
Net Energy Maintenance (Mcal/lb)	0.64
Net Energy Gain (Mcal/lb)	0.38
NDF Dig. Rate (Kd, %HR, Van Amburgh, Lignin*2.4)	4.85
NDF Dig. Rate (Kd, %HR, uNDF)	8.3
Starch Dig. Rate (Kd, %HR, Mertens)	
Relative Feed Value (RFV)	123
Relative Forage Quality (RFQ)	168
Milk per Ton (lbs/ton)	3060
Dig. Organic Matter Index (lbs/ton)	402
Non Fiber Carbohydrates (%DM)	17.9
Non Structural Carbohydrates (%DM)	3.4
DCAD (meq/100gdm)	
CNCPS / CPM Lignin Factor	4.9
Summative Index % (Mass Balance)	100.7

Additional sample information, source and lab pictures

Reported: **02/18/2020**

TRITICALE

SAMPLE INFORMATION

Lab ID:	23329 078	Version:	1.0
Crop Year:	2017	Series:	
Feed Type:	TRITICALE FORAGE	Cutting#:	
Package:	BASIC NIR		

NIR ANALYSIS RESULTS

Moisture	67.7
Dry Matter	32.3

PROTEINS	% SP	% CP	% DM
Crude Protein			12.7
Adjusted Protein			
Soluble Protein		73.3	9.3
Ammonia (CPE)	16.1	11.8	1.50
ADF Protein (ADICP)		6.0	0.77
NDF Protein (NDICP)		11.7	1.49
NDR Protein (NDRCP)			
Rumen Degr. Protein		86.6	11.0

FIBER	%NDFom	NDFom %DM	% NDF	% DM
ADF			63.4	37.3
aNDF		54.6		58.7
NDR (NDF w/o sulfite)				
Crude Fiber				
Lignin			6.13	3.60
NDF Digestibility (12 hr)				
NDF Digestibility (24 hr)				
NDF Digestibility (30 hr)	76.2	41.6	70.8	41.6
NDF Digestibility (72 hr)				
NDF Digestibility (120 hr)	80.4	43.9	74.8	43.9
NDF Digestibility (240 hr)	84.6	46.2	78.8	46.3
uNDF (30 hr)	23.8	13.0	29.2	17.1
uNDF (120 hr)	19.6	10.7	25.2	14.8
uNDF (240 hr)	15.4	8.4	21.2	12.5

CARBOHYDRATES	% Starch	% NFC	% DM
Silage Acids		23.9	4.0
Ethanol Soluble CHO (ESC-Sugar)		26.1	4.4
Water Soluble CHO (WSC-Sugar)			
Starch		8.4	1.4
Soluble Starch			
Soluble Fiber		37.0	6.22
Starch Dig. (7 hr, 4 mm)			
Crude Fat			3.07
Fatty Acids, Total			1.12
C16:0			
C18:0			
C18:1			
C18:2			
C18:3			
Unsaturated Fatty Acids (RUFAL)			
Fatty Acids (%Fat)			36.5

Values in bold were analyzed by wet chemistry methods.

MINERALS

Ash (%DM)	10.2
Calcium (%DM)	0.29
Phosphorus (%DM)	0.36
Magnesium (%DM)	0.13
Potassium (%DM)	2.66
Sulfur (%DM)	0.19
Sodium (%DM)	
Chloride (%DM)	
Iron (PPM)	
Manganese (PPM)	
Zinc (PPM)	
Copper (PPM)	
Molybdenum (PPM)	

QUALITATIVE

Total VFA (%DM)	3.85
Lactic Acid (%DM)	3.17
Lactic as % of Total VFA	82
Acetic Acid (%DM)	0.68
Butyric Acid (%DM)	
1, 2 Propanediol (%DM)	
Nitrate Ion (%DM)	

Soil Contamination Probability	
Nitrate Probability	Probable low nitrate level
NIR Statistical Confidence	Excellent prediction potential

ENERGY & INDEX CALCULATIONS

pH	4.87
TDN (%DM)	60.8
Net Energy Lactation (Mcal/lb)	0.62
Net Energy Maintenance (Mcal/lb)	0.59
Net Energy Gain (Mcal/lb)	0.33
ME (Mcal/lb)	1
NDF Dig. Rate (Kd, %HR, Van Amburgh, Lignin*2.4)	5.25
NDF Dig. Rate (Kd, %HR, uNDF)	6.0
Starch Dig. Rate (Kd, %HR, Mertens)	
Relative Feed Value (RFV)	95
Relative Forage Quality (RFQ)	168
Milk per Ton (lbs/ton)	2936
Dig. Organic Matter Index (lbs/ton)	470
Non Fiber Carbohydrates (%DM)	16.80
Non Structural Carbohydrates (%DM)	5.8
DCAD (meq/100gdm)	
Summative Index % (Mass Balance)	96.1

Additional sample information, submitted documents and lab pictures linked to QR code

Desc: RYELAGE
Submitter: BIG GAIN WISCONSIN, LLC., DAN
Account: BIG GAIN WISCONSIN, LLC

RYELAGE

SAMPLE INFORMATION			
Lab ID:	18851 042	Version:	1.0
Crop Year:	2015	Series:	
Feed Type:	RYE FORAGE	Cutting#:	
Package:	BASIC NIR		

NIR ANALYSIS RESULTS	
Moisture	47.3
Dry Matter	52.7

PROTEINS	% SP	% CP	% DM
Crude Protein			15.4
Adjusted Protein			
Soluble Protein		74.4	11.5
Ammonia	10.1	7.5	1.16
ADF Protein (ADICP)		5.1	0.79
NDF Protein (NDICP)		10.2	1.57
NDR Protein (NDRCP)			
Rumen Degr. Protein		87.2	13.4
Rumen Deg. CP (Strep.G)			

FIBER	%NDFom	NDFom %DM	% NDF	% DM
ADF			67.1	37.0
aNDF		52.8		55.0
NDR (NDF w/o sulfite)				
peNDF				
Crude Fiber				
Lignin			7.05	3.88
NDF Digestibility (12 hr)				
NDF Digestibility (24 hr)				
NDF Digestibility (30 hr)	67.8	35.8	65.2	35.9
NDF Digestibility (48 hr)				
NDF Digestibility (120 hr)	78.0	41.2	74.9	41.2
NDF Digestibility (240 hr)	82.0	43.3	78.8	43.4
uNDF (30 hr)	32.2	17.0	34.8	19.2
uNDF (120 hr)	22.0	11.6	25.1	13.8
uNDF (240 hr)	18.0	9.5	21.2	11.7

CARBOHYDRATES	% Starch	% NFC	% DM
Silage Acids		35.0	6.1
Ethanol Soluble CHO (Sugar)		29.3	5.1
Water Soluble CHO (Sugar)			
Starch		5.9	1.0
Soluble Fiber		27.3	4.78
Starch Dig. (7 hr, 4 mm)			
Fatty Acids, Total			2.10
Fatty Acids (%Fat)			50.7
Crude Fat			4.14

Values in bold were analyzed by wet chemistry methods.
Definitions and explanation of report terms

Sampled:
Arrived: **09/24/2015**
Completed: **09/24/2015**
Reported: **09/25/2015**

MINERALS	
Ash (%DM)	9.52
Calcium (%DM)	0.36
Phosphorus (%DM)	0.40
Magnesium (%DM)	0.15
Potassium (%DM)	2.68
Sulfur (%DM)	0.22
Sodium (%DM)	
Chloride (%DM)	
Iron (PPM)	
Manganese (PPM)	
Zinc (PPM)	
Copper (PPM)	
Nitrate Ion (%DM)	
Selenium (PPM)	
Molybdenum (PPM)	

QUALITATIVE	
Total VFA (%DM)	5.80
Lactic Acid (%DM)	5.25
Lactic as % of Total VFA	86
Acetic Acid (%DM)	0.55
Butyric Acid (%DM)	
1, 2 Propanediol (%DM)	
Titratable Acidity (meq/100gm)	3.80

Soil Contamination Probability	Probable low to none
Nitrate Probability	Probable low nitrate level
NIR Statistical Confidence	Excellent prediction potential

ENERGY & INDEX CALCULATIONS	
pH	4.70
TDN (%DM)	63.4
Net Energy Lactation (mcal/lb)	0.65
Net Energy Maintenance (mcal/lb)	0.64
Net Energy Gain (mcal/lb)	0.37
NDF Dig. Rate (Kd, %HR, Van Amburgh, Lignin*2.4)	4.66
NDF Dig. Rate (Kd, %HR, uNDF)	5.48
Starch Dig. Rate (Kd, %HR, Mertens)	
Relative Feed Value (RFV)	102
Relative Feed Quality (RFQ)	159
Milk per Ton (lbs/ton)	3087
Dig. Organic Matter Index (lbs/ton)	752
Non Fiber Carbohydrates (%DM)	15.9
Non Structural Carbohydrates (%DM)	6.1
DCAD (meq/100gdm)	
CNCPS / CPM Lignin Factor	4.9
Summative Index % (Mass Balance)	98.3
Additional sample information, source and lab pictures	

Account: FURST MCNESS-LODI

Completed: **05/08/2019**
Reported: **05/08/2019**

RYELAGE

SAMPLE INFORMATION			
Lab ID:	26048 270	Version:	1.0
Crop Year:		Series:	
Feed Type:	SMALL GRAIN SILAGE	Cutting#:	
Package:	NIR Wet Minerals, Cl, S		

NIR ANALYSIS RESULTS	
Moisture	72.1
Dry Matter	27.9

PROTEINS	% SP	% CP	% DM
Crude Protein			14.3
Adjusted Protein			
Soluble Protein		77.5	11.1
Ammonia (CPE)	38.2	29.6	4.24
ADF Protein (ADICP)		4.8	0.69
NDF Protein (NDICP)		6.3	0.90
NDR Protein (NDRCP)			
Rumen Degr. Protein		88.8	12.7
Rumen Deg. CP (Strep.G)			

FIBER	%NDFom	NDFom %DM	% NDF	% DM
ADF			65.7	39.5
aNDF		58.8		60.0
NDR (NDF w/o sulfite)				
peNDF				
Crude Fiber				
Lignin			7.15	4.29
NDF Digestibility (12 hr)				
NDF Digestibility (24 hr)				
NDF Digestibility (30 hr)	72.1	42.4	70.7	42.5
NDF Digestibility (48 hr)				
NDF Digestibility (120 hr)	78.7	46.3	77.2	46.3
NDF Digestibility (240 hr)	82.1	48.3	80.5	48.3
uNDF (30 hr)	27.9	16.4	29.3	17.6
uNDF (120 hr)	21.3	12.5	22.8	13.7
uNDF (240 hr)	17.9	10.5	19.5	11.7

CARBOHYDRATES	% Starch	% NFC	% DM
Silage Acids		76.7	9.3
Ethanol Soluble CHO (Sugar)		10.3	1.3
Water Soluble CHO (Sugar)			
Starch		3.0	0.4
Soluble Fiber		26.4	3.22
Starch Dig. (7 hr, 4 mm)			
Fatty Acids, Total			1.84
Fatty Acids (%Fat)			43.3
Crude Fat			4.25

Values in bold were analyzed by wet chemistry methods.
Definitions and explanation of report terms

MINERALS	
Ash (%DM)	10.1
Calcium (%DM)	**0.53**
Phosphorus (%DM)	**0.45**
Magnesium (%DM)	**0.14**
Potassium (%DM)	**3.24**
Sulfur (%DM)	**0.23**
Sodium (%DM)	**0.08**
Chloride (%DM)	**1.37**
Iron (PPM)	**452**
Manganese (PPM)	**66**
Zinc (PPM)	**32**
Copper (PPM)	**9**
Nitrate Ion (%DM)	
Selenium (PPM)	
Molybdenum (PPM)	

QUALITATIVE	
Total VFA (%DM)	9.34
Lactic Acid (%DM)	2.98
Lactic as % of Total VFA	32
Acetic Acid (%DM)	4.91
Butyric Acid (%DM)	1.45
1, 2 Propanediol (%DM)	

Soil Contamination Probability	
Nitrate Probability	
NIR Statistical Confidence	Excellent prediction potential

ENERGY & INDEX CALCULATIONS	
pH	4.80
TDN (%DM)	60.6
Net Energy Lactation (Mcal/lb)	0.62
Net Energy Maintenance (Mcal/lb)	0.60
Net Energy Gain (Mcal/lb)	0.34
NDF Dig. Rate (Kd, %HR, Van Amburgh, Lignin*2.4)	5.59
NDF Dig. Rate (Kd, %HR, uNDF)	5.7
Starch Dig. Rate (Kd, %HR, Mertens)	
Relative Feed Value (RFV)	90
Relative Forage Quality (RFQ)	165
Milk per Ton (lbs/ton)	2992
Dig. Organic Matter Index (lbs/ton)	404
Non Fiber Carbohydrates (%DM)	12.20
Non Structural Carbohydrates (%DM)	1.7
DCAD (meq/100gdm)	33.4
CNCPS / CPM Lignin Factor	4.9
Summative Index % (Mass Balance)	98.5
Additional sample information, source and lab pictures	

In our Lactating Rations

- High group
  - Feed at 10#s inclusion rate
- Later lactation
  - Can feed at 20#dm
  - Feed has enough energy and protein
  - Mix with a little supplement, dry hay, and pasture

Heifer Rations

- Look to feed about 60%TDN for pregnant
- Target 65%ish for 450#-bred
- Using these small grain forages simple to balance just adding a little corn silage & concentrate

Dry Cow Diets

- Do not like to feed spring harvested forages
- Will feed to far off dry cows if spring planted at harvest at dough or later
- Exception might just be wheat silage harvested at dough stage
- Matures much later
- K uptake not as great?

SAMPLE INFORMATION

Lab ID:	27233 136	Version:	1.0
Crop Year:	2019	Series:	
Feed Type:	SORGHUM FORAGE	Cutting#:	
Package:	NIR Wet Minerals, Cl, S		

NIR ANALYSIS RESULTS

Moisture	63.9
Dry Matter	36.1

PROTEINS	% SP	% CP	% DM
Crude Protein			5.8
Adjusted Protein		87.5	5.0
Soluble Protein		28.8	1.7
Ammonia (CPE)	31.3	9.0	0.52
ADF Protein (ADICP)		22.5	1.30
NDF Protein (NDICP)		45.4	2.62
NDR Protein (NDRCP)			
Rumen Degr. Protein		64.4	3.7

FIBER	%NDFom	NDFom %DM	% NDF	% DM
ADF			66.1	47.6
aNDF		69.8		72.0
NDR (NDF w/o sulfite)				
Crude Fiber				
Lignin			8.47	6.10
NDF Digestibility (12 hr)				
NDF Digestibility (24 hr)				
NDF Digestibility (30 hr)	49.0	34.2	47.5	34.2
NDF Digestibility (72 hr)				
NDF Digestibility (120 hr)	64.4	45.0	62.5	45.0
NDF Digestibility (240 hr)	67.9	47.4	65.8	47.4
uNDF (30 hr)	51.0	35.6	52.5	37.8
uNDF (120 hr)	35.6	24.8	37.5	27.0
uNDF (240 hr)	32.1	22.4	34.2	24.6

CARBOHYDRATES	% Starch	% NFC	% DM
Silage Acids		33.0	4.8
Ethanol Soluble CHO (ESC-Sugar)		28.3	4.1
Water Soluble CHO (WSC-Sugar)			
Starch		5.0	0.7
Soluble Starch			
Soluble Fiber		31.2	4.55
Starch Dig. (7 hr, 4 mm)			
Crude Fat			2.30
Fatty Acids, Total			1.05
C16:0			0.21
C18:0			0.02
C18:1			0.03
C18:2			0.20
C18:3			0.59
Unsaturated Fatty Acids (RUFAL)			0.82
Fatty Acids (%Fat)			45.7

Values in bold were analyzed by wet chemistry methods.

MINERALS

Ash (%DM)	7.98
Calcium (%DM)	**0.44**
Phosphorus (%DM)	**0.29**
Magnesium (%DM)	**0.47**
Potassium (%DM)	**1.40**
Sulfur (%DM)	**0.11**
Sodium (%DM)	**0.01**
Chloride (%DM)	**0.13**
Iron (PPM)	**347**
Manganese (PPM)	**46**
Zinc (PPM)	**27**
Copper (PPM)	**6**
Molybdenum (PPM)	

QUALITATIVE

Total VFA (%DM)	5.28
Lactic Acid (%DM)	1.93
Lactic as % of Total VFA	40
Acetic Acid (%DM)	2.88
Butyric Acid (%DM)	
1, 2 Propanediol (%DM)	
Nitrate Ion (%DM)	

Soil Contamination Probability	Probable low to none
Nitrate Probability	Probable low nitrate level
NIR Statistical Confidence	Good prediction potential

ENERGY & INDEX CALCULATIONS

pH	4.31
TDN (%DM)	54.0
Net Energy Lactation (Mcal/lb)	0.54
Net Energy Maintenance (Mcal/lb)	0.49
Net Energy Gain (Mcal/lb)	0.24
ME (Mcal/lb)	0.9
NDF Dig. Rate (Kd, %HR, Van Amburgh, Lignin*2.4)	2.89
NDF Dig. Rate (Kd, %HR, uNDF)	3.7
Starch Dig. Rate (Kd, %HR, Mertens)	
Relative Feed Value (RFV)	
Relative Forage Quality (RFQ)	
Milk per Ton (lbs/ton)	
Dig. Organic Matter Index (lbs/ton)	391
Non Fiber Carbohydrates (%DM)	14.60
Non Structural Carbohydrates (%DM)	4.8
DCAD (meq/100gdm)	25.6
RFC - Fill Index	
Summative Index % (Mass Balance)	98.6

Additional sample information, submitted documents and lab pictures linked to QR code

Bringing all back together…

- Helps our crop rotation
- Grow more feed on same acres
- Keep ground covered year round

Questions?