

COMPARATIVE FEED VALUE OF WHOLE PLANT CORN PRE AND POST GRAZING

October 17, 2012

Co-operators: Ralph Daling Farms and Perennia

The objective of this trial was to compare the feed value of whole plant corn before and after grazing with sheep. The corn varieties planted were DKC 26-79 and DKC 27-54, with 2175 heat units and a relative maturity of 76-77 days. The corn plants had reach physiological maturity with a dry matter content of approximately 32 percent. The 2 acre field was strip grazed with the sheep being given an average of 5 days of grazing per block. The flock had free access to grass pasture. The sheep flock, composed of 64 ewes and lambs, were on the corn and pasture for a total of 63 days, from August 30 to November 16. During this period, 14 replacement lambs gained 22 pounds for a 0.35 pound gain per day; 30 market lambs gained 24.7 pounds, for a 0.39 pound gain per day and 20 ewes gained 1.25 to 1.5 points of body condition. The cost associated with the grazing corn was \$0.25 per day per animal for the 64 sheep.

Three whole corn plant samples were collected from both the grazed and the non-grazed areas of the field. Samples were taken on a 5.3 m row (17.5 feet). Plants were chopped using a corn silage harvester. A sub-sample was taken from each plot, dried and sent to *DairyOne Forage Testing Laboratory* for analysis. Results are presented as the average of the 3 samples in Table 1.

Table 1: Yield and nutrient composition of whole plant corn pre and post grazing (average of 3 samples).

| | Yield (kg DM/ha) | % CP | % ADF | % NDF | % lignin | % starch | % TDN | NDFD 30 hr, % of NDF |
|-------------------------|------------------------|------|-------|-------|-------------|-------------|-------|----------------------------|
| Pre grazing | 12 800 | 7.33 | 25.27 | 46.37 | 4.23 | 33.87 | 70.33 | 47.33 |
| Post grazing | 3490 | 4.87 | 48.67 | 79.87 | 6.87 | 3.7 | 47.67 | 45.00 |

In the grazed section of the field, the sheep stripped the plants of their grain leaving only some leaves and the corn stock (Figure 1-B). Yield for whole plant post-grazing was consequently lower than for whole plant pre-grazing. The same was observed for % CP, % starch, % TDN and NDFD 30 hr. Analysis results are also presented on Figure 2. The analysis from *DairyOne* is attached to this report.



Figure 1: Corn field pre grazing (A) and post grazing (B).

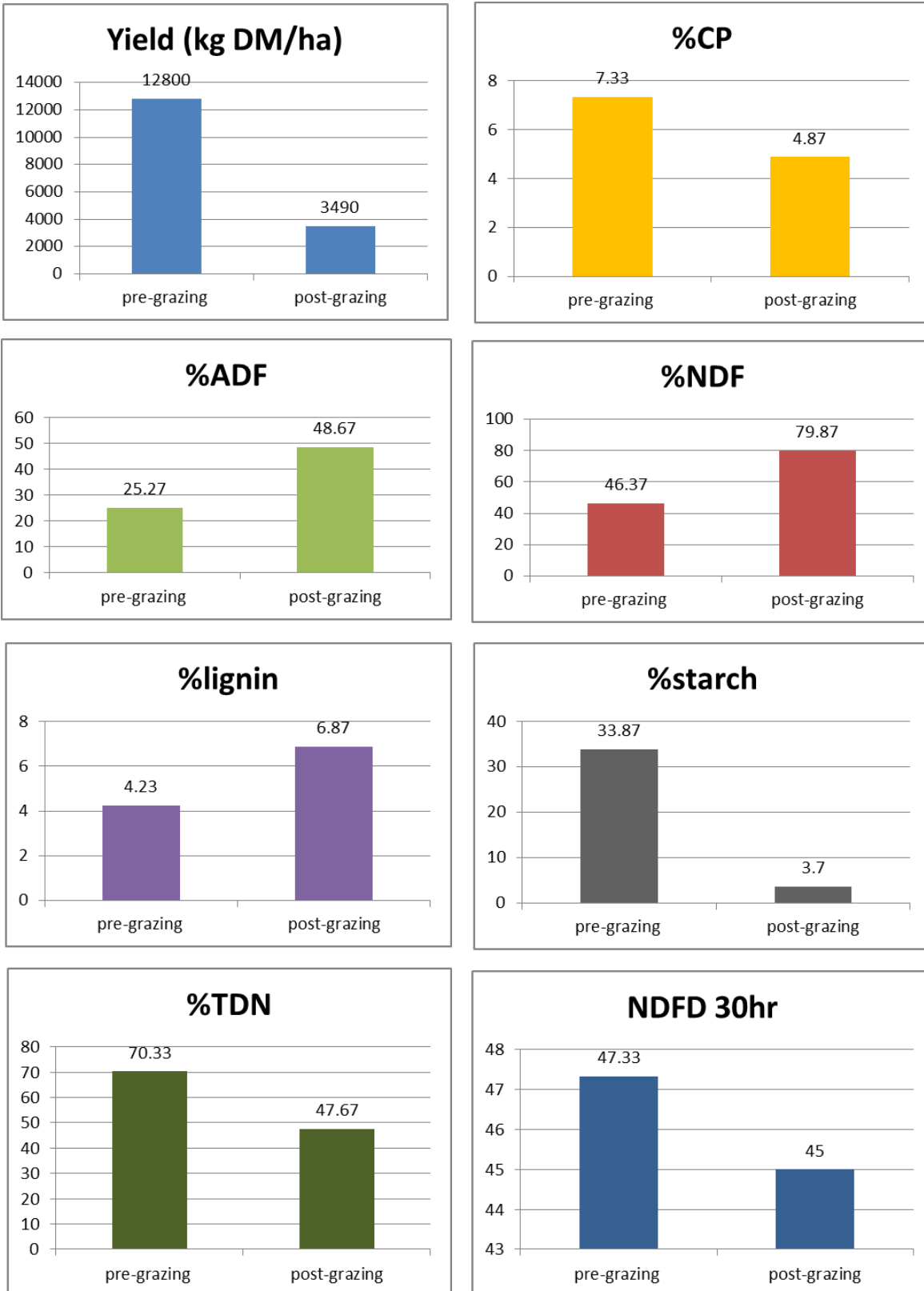


Figure 2: Yield and nutrient composition of whole plant corn pre and post grazing (average of 3 samples).



FORAGE TESTING LABORATORY
 DAIRY ONE, INC.
 730 WARREN ROAD
 ITHACA, NEW YORK 14850
 607-257-1272 (fax 607-257-1350)

| Sample Description | Farm | Code | Sample |
|--------------------|------|------|----------|
| CORN STALKLAGE | | 324D | 18651360 |

| Sampled | Recvd | Printed | ST | CO |
|---------|----------|----------|----|----|
| | 11/02/12 | 11/02/12 | | |

#1 Post grazing
 PERENNIA
 199 INNOVATION DRIVE
 BIBLE HILL
 NOVA SCOTIA, NS B6L 2H5
 CANADA

Analysis Results

| Components | As Fed | DM |
|---------------------------|--------|------|
| % Moisture | 6.0 | |
| % Dry Matter | 94.0 | |
| % Crude Protein | 3.9 | 4.2 |
| % Available Protein | 3.7 | 4.0 |
| % ADICP | .2 | .2 |
| % Adjusted Crude Protein | 3.9 | 4.2 |
| Soluble Protein % CP | | 53 |
| Degradable Protein%CP | | 65 |
| % NDICP | .7 | .8 |
| % Acid Detergent Fiber | 45.7 | 48.6 |
| % Neutral Detergent Fiber | 75.7 | 80.5 |
| % Lignin | 5.8 | 6.2 |
| % NFC | 9.3 | 9.9 |
| % Starch | 4.2 | 4.4 |
| % WSC (Water Sol. Carbs.) | 3.0 | 3.2 |
| % ESC (Simple Sugars) | 5.1 | 5.5 |
| % Crude Fat | .9 | 1.0 |
| % Ash | 4.95 | 5.26 |
| % TDN | 45 | 48 |
| NEL, Mcal/Lb | .21 | .23 |
| NEM, Mcal/Lb | .31 | .33 |
| NEG, Mcal/Lb | .09 | .09 |
| % Calcium | .15 | .16 |
| % Phosphorus | .05 | .05 |
| % Magnesium | .10 | .11 |
| % Potassium | .75 | .80 |
| % Sulfur | .05 | .05 |
| % Chloride Ion | .28 | .30 |
| IVTD 30hr, % of DM | | 56 |
| NDFD 30hr, % of NDF | | 45 |
| kd, %/hr | | 3.21 |
| % Lysine | .10 | .10 |
| % Methionine | .06 | .06 |

ENERGY TABLE - NRC 2001

| | Mcal/Lb | Mcal/Kg |
|----------|---------|---------|
| DE, 1X | 1.01 | 2.22 |
| ME, 1X | 0.82 | 1.80 |
| NEL, 3X | 0.44 | 0.97 |
| NEM, 3X | 0.45 | 0.98 |
| NEG, 3X | 0.20 | 0.44 |
| TDN1X, % | 52 | |

COMMENTS:

1.EFFECTIVE 4/01/12, PREPAID
 POSTAGE MAILER FEES WILL
 INCREASE TO \$4 FOR INDIVIDUAL
 MAILERS AND \$10 FOR LARGE
 MAILERS. VISIT OUR WEBSITE FOR
 INFO ON OUR NEW UPS SERVICE.
 WWW.DAIRYONE.COM/FORAGE/SERVICE
 S



FORAGE TESTING LABORATORY
 DAIRY ONE, INC.
 730 WARREN ROAD
 ITHACA, NEW YORK 14850
 607-257-1272 (fax 607-257-1350)

| | | | |
|--------------------|------|------|----------|
| Sample Description | Farm | Code | Sample |
| CORN STALKLAGE | | 324D | 18651370 |

| | | | | |
|---------|----------|----------|----|----|
| Sampled | Recvd | Printed | ST | CO |
| | 11/02/12 | 11/02/12 | | |

#2 Post grazing
 PERENNIA
 199 INNOVATION DRIVE
 BIBLE HILL
 NOVA SCOTIA, NS B6L 2H5
 CANADA

ENERGY TABLE - NRC 2001

| | Mcal/Lb | Mcal/Kg |
|----------|---------|---------|
| DE, 1X | 0.98 | 2.15 |
| ME, 1X | 0.78 | 1.73 |
| NEL, 3X | 0.42 | 0.93 |
| NEM, 3X | 0.42 | 0.93 |
| NEG, 3X | 0.17 | 0.38 |
| TDN1X, % | 50 | |

COMMENTS:

- MILK/TON BY MILK2006
- EFFECTIVE 4/01/12, PREPAID POSTAGE MAILER FEES WILL INCREASE TO \$4 FOR INDIVIDUAL MAILERS AND \$10 FOR LARGE MAILERS. VISIT OUR WEBSITE FOR INFO ON OUR NEW UPS SERVICE. WWW.DAIRYONE.COM/FORAGE/SERVICES
- * SCHWAB - SHAVER (SS) ADJUSTMENTS FOR STARCH DIGESTIBILITY.

Analysis Results

| Components | As Fed | DM |
|---------------------------|--------|------|
| % Moisture | 6.3 | |
| % Dry Matter | 93.7 | |
| % Crude Protein | 5.3 | 5.6 |
| % Available Protein | 5.1 | 5.4 |
| % ADICP | .2 | .2 |
| % Adjusted Crude Protein | 5.3 | 5.6 |
| Soluble Protein % CP | | 49 |
| Degradable Protein%CP | | 60 |
| % NDICP | 1.4 | 1.5 |
| % Acid Detergent Fiber | 45.7 | 48.8 |
| % Neutral Detergent Fiber | 73.5 | 78.5 |
| % Lignin | 6.9 | 7.3 |
| % NFC | 9.2 | 9.9 |
| % Starch | 3.2 | 3.4 |
| % WSC (Water Sol. Carbs.) | 3.9 | 4.2 |
| % ESC (Simple Sugars) | 4.3 | 4.6 |
| % Crude Fat | 1.0 | 1.1 |
| % Ash | 5.95 | 6.35 |
| % TDN | 44 | 47 |
| NEL, Mcal/Lb | .24 | .26 |
| NEM, Mcal/Lb | .31 | .33 |
| NEG, Mcal/Lb | .08 | .09 |
| % Calcium | .21 | .22 |
| % Phosphorus | .04 | .04 |
| % Magnesium | .19 | .20 |
| % Potassium | .83 | .89 |
| % Sulfur | .06 | .06 |
| % Chloride Ion | .41 | .44 |
| IVTD 30hr, % of DM | | 56 |
| NDFD 30hr, % of NDF | | 44 |
| kd, %/hr | | 3.33 |
| % Lysine | .13 | .14 |
| % Methionine | .08 | .09 |

FORAGE TESTING LABORATORY
 DAIRY ONE, INC.
 730 WARREN ROAD
 ITHACA, NEW YORK 14850
 607-257-1272 (fax 607-257-1350)

| | | | | |
|---------|----------|----------|----|----|
| Sampled | Recvd | Printed | ST | CO |
| | 11/02/12 | 11/02/12 | | |

#3 Post grazing
 PERENNIA
 199 INNOVATION DRIVE
 BIBLE HILL
 NOVA SCOTIA, NS B6L 2H5
 CANADA

ENERGY TABLE - NRC 2001

| | Mcal/Lb | Mcal/Kg |
|----------|---------|---------|
| DE, 1X | 0.97 | 2.15 |
| ME, 1X | 0.78 | 1.72 |
| NEL, 3X | 0.42 | 0.92 |
| NEM, 3X | 0.42 | 0.92 |
| NEG, 3X | 0.17 | 0.38 |
| TDN1X, % | 50 | |

COMMENTS:

- MILK/TON BY MILK2006
- EFFECTIVE 4/01/12, PREPAID POSTAGE MAILER FEES WILL INCREASE TO \$4 FOR INDIVIDUAL MAILERS AND \$10 FOR LARGE MAILERS. VISIT OUR WEBSITE FOR INFO ON OUR NEW UPS SERVICE. WWW.DAIRYONE.COM/FORAGE/SERVICES
- * SCHWAB - SHAVER (SS) ADJUSTMENTS FOR STARCH DIGESTIBILITY.

| | | | |
|--------------------|------|------|----------|
| Sample Description | Farm | Code | Sample |
| CORN STALKLAGE | | 324D | 18651380 |

Analysis Results

| Components | As Fed | DM |
|---------------------------|--------|------|
| % Moisture | 6.0 | |
| % Dry Matter | 94.0 | |
| % Crude Protein | 4.5 | 4.8 |
| % Available Protein | 4.3 | 4.6 |
| % ADICP | .2 | .2 |
| % Adjusted Crude Protein | 4.5 | 4.8 |
| Soluble Protein % CP | | 50 |
| Degradable Protein%CP | | 75 |
| % NDICP | 1.1 | 1.2 |
| % Acid Detergent Fiber | 45.7 | 48.6 |
| % Neutral Detergent Fiber | 75.7 | 80.6 |
| % Lignin | 6.7 | 7.1 |
| % NFC | 8.5 | 9.1 |
| % Starch | 3.1 | 3.3 |
| % WSC (Water Sol. Carbs.) | 3.3 | 3.5 |
| % ESC (Simple Sugars) | 5.4 | 5.7 |
| % Crude Fat | .9 | 1.0 |
| % Ash | 5.47 | 5.82 |
| % TDN | 45 | 48 |
| NEL, Mcal/Lb | .21 | .23 |
| NEM, Mcal/Lb | .32 | .34 |
| NEG, Mcal/Lb | .09 | .10 |
| % Calcium | .16 | .17 |
| % Phosphorus | .02 | .02 |
| % Magnesium | .12 | .13 |
| % Potassium | .85 | .90 |
| % Sulfur | .06 | .06 |
| % Chloride Ion | .34 | .36 |
| IVTD 30hr, % of DM | | 57 |
| NDFD 30hr, % of NDF | | 46 |
| kd, %/hr | | 3.51 |
| % Lysine | .11 | .12 |
| % Methionine | .07 | .07 |



FORAGE TESTING LABORATORY
 DAIRY ONE, INC.
 730 WARREN ROAD
 ITHACA, NEW YORK 14850
 607-257-1272 (fax 607-257-1350)

| Sample Description | Farm | Code | Sample |
|--------------------|------|------|----------|
| CORN SILAGE | | 323D | 18651390 |

| Sampled | Recvd | Printed | ST | CO |
|---------|----------|----------|----|----|
| | 11/02/12 | 11/02/12 | | |

#4 Pre grazing
 PERENNIA
 199 INNOVATION DRIVE
 BIBLE HILL
 NOVA SCOTIA, NS B6L 2H5
 CANADA

Analysis Results

| Components | As Fed | DM |
|---------------------------|--------|-------|
| % Moisture | 6.8 | |
| % Dry Matter | 93.2 | |
| % Crude Protein | 7.2 | 7.7 |
| % Available Protein | 6.7 | 7.2 |
| % ADICP | .5 | .6 |
| % Adjusted Crude Protein | 7.2 | 7.7 |
| Soluble Protein % CP | | 27 |
| Ammonia % Sol. Prot. | | 5 |
| Degradable Protein%CP | | 44 |
| % NDICP | 1.3 | 1.4 |
| % Acid Detergent Fiber | 24.3 | 26.1 |
| % Neutral Detergent Fiber | 44.4 | 47.6 |
| % Lignin | 3.8 | 4.1 |
| % NFC | 37.9 | 40.7 |
| % Starch | 28.3 | 30.4 |
| Digestible Starch%Starch | | 27 |
| % WSC (Water Sol. Carbs.) | 6.2 | 6.6 |
| % ESC (Simple Sugars) | 5.4 | 5.8 |
| % Crude Fat | 2.5 | 2.7 |
| % Ash | 2.52 | 2.70 |
| % TDN | 67 | 72 |
| NEL, Mcal/Lb | .67 | .72 |
| NEM, Mcal/Lb | .69 | .74 |
| NEG, Mcal/Lb | .43 | .47 |
| % Calcium | .19 | .20 |
| % Phosphorus | .21 | .23 |
| % Magnesium | .16 | .17 |
| % Potassium | .82 | .88 |
| % Sulfur | .07 | .08 |
| % Chloride Ion | .25 | .27 |
| % Ammonia (Protein Equiv) | .09 | .10 |
| % Lactic Acid | .09 | .10 |
| % Acetic Acid | .09 | .10 |
| IVTD 30hr, % of DM | | 77 |
| NDFD 30hr, % of NDF | | 52 |
| kd, %/hr | | 4.28 |
| Milk Lbs./Ton of DM | | 2,769 |
| Milk Lbs./Proc. Ton of DM | | 3,015 |
| *SS NEL, Mcal/Lb | | .65 |
| *SS Proc. NEL, Mcal/Lb | | .68 |
| % Lysine | .18 | .19 |
| % Methionine | .11 | .12 |

ENERGY TABLE - NRC 2001

| | Mcal/Lb | Mcal/Kg |
|----------|---------|---------|
| DE, 1X | 1.31 | 2.89 |
| ME, 1X | 1.12 | 2.47 |
| NEL, 3X | 0.64 | 1.42 |
| NEM, 3X | 0.68 | 1.49 |
| NEG, 3X | 0.41 | 0.90 |
| TDN1X, % | 67 | |

COMMENTS:

- MILK/TON BY MILK2006
- STARCH DIGESTIBILITY 7 HR., 4 MM. INTERPRET STARCH DIGESTIBILITY AS FOLLOWS:
 HIGH > 88%,
 MODERATE 79-87%,
 LOW < 78%.
- EFFECTIVE 4/01/12, PREPAID POSTAGE MAILER FEES WILL INCREASE TO \$4 FOR INDIVIDUAL MAILERS AND \$10 FOR LARGE MAILERS. VISIT OUR WEBSITE FOR INFO ON OUR NEW UPS SERVICE. WWW.DAIRYONE.COM/FORAGE/SERVICES
- * SCHWAB - SHAVER (SS) ADJUSTMENTS FOR STARCH DIGESTIBILITY.

FORAGE TESTING LABORATORY
 DAIRY ONE, INC.
 730 WARREN ROAD
 ITHACA, NEW YORK 14850
 607-257-1272 (fax 607-257-1350)

| Sample Description | Farm | Code | Sample |
|--------------------|------|------|----------|
| CORN SILAGE | | 323D | 18651400 |

| Sampled | Recvd | Printed | ST | CO |
|---------|----------|----------|----|----|
| | 11/02/12 | 11/02/12 | | |

#5 Pre grazing
 PERENNIA
 199 INNOVATION DRIVE
 BIBLE HILL
 NOVA SCOTIA, NS B6L 2H5
 CANADA

| Analysis Results | | |
|---------------------------|--------|-------|
| Components | As Fed | DM |
| % Moisture | 6.2 | |
| % Dry Matter | 93.8 | |
| % Crude Protein | 6.3 | 6.7 |
| % Available Protein | 5.8 | 6.2 |
| % ADICP | .5 | .5 |
| % Adjusted Crude Protein | 6.3 | 6.7 |
| Soluble Protein % CP | | 25 |
| Ammonia % Sol. Prot. | | 6 |
| Degradable Protein%CP | | 63 |
| % NDICP | 1.2 | 1.2 |
| % Acid Detergent Fiber | 25.2 | 26.9 |
| % Neutral Detergent Fiber | 46.3 | 49.3 |
| % Lignin | 4.3 | 4.6 |
| % NFC | 38.1 | 40.6 |
| % Starch | 30.6 | 32.6 |
| Digestible Starch%Starch | | 42 |
| % WSC (Water Sol. Carbs.) | 5.1 | 5.5 |
| % ESC (Simple Sugars) | 4.1 | 4.3 |
| % Crude Fat | 2.3 | 2.5 |
| % Ash | 2.03 | 2.16 |
| % TDN | 65 | 69 |
| NEL, Mcal/Lb | .64 | .68 |
| NEM, Mcal/Lb | .65 | .70 |
| NEG, Mcal/Lb | .40 | .43 |
| % Calcium | .16 | .17 |
| % Phosphorus | .20 | .21 |
| % Magnesium | .14 | .15 |
| % Potassium | .77 | .82 |
| % Sulfur | .07 | .07 |
| % Chloride Ion | .23 | .25 |
| % Ammonia (Protein Equiv) | .09 | .10 |
| % Lactic Acid | .09 | .10 |
| % Acetic Acid | .09 | .10 |
| IVTD 30hr, % of DM | | 74 |
| NDFD 30hr, % of NDF | | 48 |
| kd, %/hr | | 3.84 |
| Milk Lbs./Ton of DM | | 2,578 |
| Milk Lbs./Proc. Ton of DM | | 2,842 |
| *SS NEL, Mcal/Lb | | .61 |
| *SS Proc. NEL, Mcal/Lb | | .64 |
| % Lysine | .16 | .17 |
| % Methionine | .10 | .10 |

ENERGY TABLE - NRC 2001

| | Mcal/Lb | Mcal/Kg |
|---------|---------|---------|
| DE, 1X | 1.29 | 2.84 |
| ME, 1X | 1.10 | 2.42 |
| NEL, 3X | 0.63 | 1.38 |
| NEM, 3X | 0.66 | 1.45 |
| NEG, 3X | 0.39 | 0.87 |

TDN1X, % 66

COMMENTS:

- MILK/TON BY MILK2006
- STARCH DIGESTIBILITY 7 HR., 4 MM. INTERPRET STARCH DIGESTIBILITY AS FOLLOWS:
 HIGH > 88%,
 MODERATE 79-87%,
 LOW < 78%.
- EFFECTIVE 4/01/12, PREPAID POSTAGE MAILER FEES WILL INCREASE TO \$4 FOR INDIVIDUAL MAILERS AND \$10 FOR LARGE MAILERS. VISIT OUR WEBSITE FOR INFO ON OUR NEW UPS SERVICE. WWW.DAIRYONE.COM/FORAGE/SERVICES
- * SCHWAB - SHAVER (SS) ADJUSTMENTS FOR STARCH DIGESTIBILITY.

FORAGE TESTING LABORATORY
 DAIRY ONE, INC.
 730 WARREN ROAD
 ITHACA, NEW YORK 14850
 607-257-1272 (fax 607-257-1350)

| Sample Description | Farm | Code | Sample |
|--------------------|------|------|----------|
| CORN SILAGE | | 323D | 18651410 |

| Sampled | Recvd | Printed | ST | CO |
|---------|----------|----------|----|----|
| | 11/02/12 | 11/02/12 | | |

#6 Pre grazing
 PERENNIA
 199 INNOVATION DRIVE
 BIBLE HILL
 NOVA SCOTIA, NS B6L 2H5
 CANADA

| Analysis Results | | |
|---------------------------|--------|-------|
| Components | As Fed | DM |
| % Moisture | 6.8 | |
| % Dry Matter | 93.2 | |
| % Crude Protein | 7.1 | 7.6 |
| % Available Protein | 6.7 | 7.2 |
| % ADICP | .4 | .4 |
| % Adjusted Crude Protein | 7.1 | 7.6 |
| Soluble Protein % CP | | 22 |
| Ammonia % Sol. Prot. | | 6 |
| Degradable Protein%CP | | 46 |
| % NDICP | 1.3 | 1.4 |
| % Acid Detergent Fiber | 21.3 | 22.8 |
| % Neutral Detergent Fiber | 39.3 | 42.2 |
| % Lignin | 3.7 | 4.0 |
| % NFC | 42.8 | 46.0 |
| % Starch | 36.0 | 38.6 |
| Digestible Starch%Starch | | 35 |
| % WSC (Water Sol. Carbs.) | 4.5 | 4.9 |
| % ESC (Simple Sugars) | 3.8 | 4.1 |
| % Crude Fat | 3.0 | 3.2 |
| % Ash | 2.31 | 2.48 |
| % TDN | 65 | 70 |
| NEL, Mcal/Lb | .67 | .72 |
| NEM, Mcal/Lb | .68 | .72 |
| NEG, Mcal/Lb | .42 | .45 |
| % Calcium | .15 | .16 |
| % Phosphorus | .21 | .23 |
| % Magnesium | .15 | .16 |
| % Potassium | .76 | .82 |
| % Sulfur | .07 | .08 |
| % Chloride Ion | .26 | .28 |
| % Ammonia (Protein Equiv) | .09 | .10 |
| % Lactic Acid | .61 | .65 |
| % Acetic Acid | .09 | .10 |
| IVTD 30hr, % of DM | | 75 |
| NDFD 30hr, % of NDF | | 42 |
| kd, %/hr | | 3.09 |
| Milk Lbs./Ton of DM | | 2,567 |
| Milk Lbs./Proc. Ton of DM | | 2,880 |
| *SS NEL, Mcal/Lb | | .63 |
| *SS Proc. NEL, Mcal/Lb | | .67 |
| % Lysine | .18 | .19 |
| % Methionine | .11 | .12 |

ENERGY TABLE - NRC 2001

| | Mcal/Lb | Mcal/Kg |
|----------|---------|---------|
| DE, 1X | 1.36 | 3.00 |
| ME, 1X | 1.17 | 2.58 |
| NEL, 3X | 0.67 | 1.49 |
| NEM, 3X | 0.71 | 1.57 |
| NEG, 3X | 0.44 | 0.97 |
| TDN1X, % | 69 | |

COMMENTS:

- MILK/TON BY MILK2006
- STARCH DIGESTIBILITY 7 HR., 4 MM. INTERPRET STARCH DIGESTIBILITY AS FOLLOWS:
 HIGH > 88%,
 MODERATE 79-87%,
 LOW < 78%.
- EFFECTIVE 4/01/12, PREPAID POSTAGE MAILER FEES WILL INCREASE TO \$4 FOR INDIVIDUAL MAILERS AND \$10 FOR LARGE MAILERS. VISIT OUR WEBSITE FOR INFO ON OUR NEW UPS SERVICE. WWW.DAIRYONE.COM/FORAGE/SERVICES
- * SCHWAB - SHAVER (SS) ADJUSTMENTS FOR STARCH DIGESTIBILITY.