Northern NY Agricultural Development Program 2015-2017 Project Report: APPENDIX
Agronomic and Forage Quality Characteristics of Brown Midrib (BMR)and Non-BMR Corn Silage Hybrids Grown in NNY: Year 3

Table A1. Fresh chop corn forage quality measures at Adirondack Farms, Peru, NY, BMR/non-BMR corn silage project, NNY, 2017.

	Hybrids			
Item	1	2	3	SE[1]
Yield, ton/ac 35% DM	21.1	28.7	23.8	
Dry matter, %	33.1	34.5	35.1	0.4
Starch, % of DM	30.1	31.4	33.7	0.7
7-h starch digestibility, % of starch	60.6	60.3	61.3	0.9
Crude protein (CP), % of DM	6.8	6.6	8.0	0.1
Soluble protein, % of DM	2.27	1.57	1.87	0.1
Total digestible nutrients (TDN), % of DM	72.3	74.4	73.8	0.9
Acid detergent fiber, % of DM	23.9	21.6	21.8	0.4
Neutral detergent fiber (aNDFom), % of DM	42.6	39.5	37.9	0.1
30-h aNDF digestibility, % of aNDFom	67.8	68.4	56.1	0.7
Undigested NDF 30-h, % of DM	13.7	12.5	16.6	0.4
Undigested NDF 120-h, % of DM	9.7	8.1	10.9	0.3
Undigested NDF 240-h, % of DM	9.1	7.8	10.6	0.3
Potentially digestible NDF (pdNDF), % of DM	33.5	31.7	27.3	0.5
Acid detergent lignin, % of DM	2.24	2.19	2.48	0.1
Nonstructural carbohydrates (NSC), % of DM	36.7	40.6	40.9	0.6
Ash, % of DM	4.2	3.3	3.7	1.0
pH	5.3	4.5	4.9	0.1
Corn silage processing score (CSPS), %	49.5	64.9	54.1	2.1

[1] Standard error of the mean; the highest standard error among the hybrids is presented.

Table A2. Forage quality measures after 30 days of fermentation for hybrids grown at Miner Institute, Chazy, NY, BMR/non-BMR corn silage project, NNY, 2017.

	Hybrids						*P*-value
Item	1	2	3	4	5	SE	Treatment
Dry matter, %	30.7[bc]	25.8[d]	28.9[c]	33.6[ab]	31.9[b]	0.5	<0.001
Starch, % of DM	30.5	29.1	30.3	29.8	31.6	1.3	0.73
7-h starch digestibility, % of starch	74.3[a]	65.5[b]	63.7[b]	66.2[ab]	65.6[b]		0.01
	(70.3 to 79.0)[1]	(62.2 to 69.5)[1]	(60.5 to 67.4)[1]	(62.8 to 70.2)[1]	(62.3 to 69.6)[1]		
Crude protein (CP), % of DM	7.8[b]	7.6[b]	8.2[a]	7.6[b]	6.9[c]	0.1	<0.001
Soluble protein, % of DM	3.3[bc]	3.6[b]	3.9[a]	3.6[b]	3.3[c]	0.1	<0.001
Total digestible nutrients (TDN), % of DM	71.4	74.6	73.4	72.7	72.3		0.06
	(70.0 to 72.9)[1]	(73.1 to 76.2)[1]	(71.9 to 74.9)[1]	(71.2 to 74.2)[1]	(70.9 to 73.8)[1]		
Acid detergent fiber, % of DM	24.1	23.9	24.1	25.4	25.9	0.7	0.21
Neutral detergent fiber (NDF), % of DM	41.7	40.1	40.3	41.8	41.3	1.0	0.63
Acid detergent lignin, % of DM	2.03[cd]	1.82[d]	2.37[bc]	2.69[b]	2.98[ab]	0.1	<0.001
Nonstructural carbohydrates (NSC), % of DM	31.6	30.7	31.8	31.2	32.7	1.2	0.82
Ash, % of DM	3.7	4.2	4.1	3.9	3.9	0.1	0.29
pH	3.72[b]	3.65[c]	3.72[b]	3.74[b]	3.80[a]	0.01	<0.001
Lactic, % of DM	5.15[abc]	5.88[ac]	5.68[ac]	4.45[b]	5.80[c]	0.2	0.001
Acetic, % of DM	2.27[a]	2.01[ab]	1.79[b]	1.78[b]	1.61[b]	0.1	0.004
Ammonia, % of CP	8.4	8.9	9.2	9.2	9.0	0.5	0.76
Dry matter recovery, %	95.3[ab]	92.3[b]	93.6[b]	94.5[b]	97.9[a]	0.7	0.001

[abcd] Least squares means within a row without a common superscript differ ($P \leq 0.05$).

[1] 95% confidence interval reported since original data were not normally distributed and were subsequently transformed for ANCOVA.

Table A3. Forage quality measures after 60 days of fermentation for hybrids grown at Miner Institute, Chazy, NY, BMR/non-BMR corn silage project, NNY, 2017.

	Hybrids						*P*-value
Item	1	2	3	4	5	SE	Treatment
Dry matter, %	30.4^{abc}	25.6^{d}	28.5^{c}	32.6^{ab}	31.1^{b}	0.6	<0.001
Starch, % of DM	31.1	29.1	30.9	31.1	32.2	1.1	0.46
7-h starch digestibility, % of starch	67.7^{b}	76.1^{a}	65.4^{b}	64.9^{b}	70.2^{ab}	1.8	0.01
Crude protein (CP), % of DM	7.9^{bc}	8.0^{b}	8.6^{a}	7.7^{c}	6.9^{d}	0.1	<0.001
Soluble protein, % of DM	3.9^{b}	4.3^{a}	4.6^{a}	3.9^{b}	3.8^{b}	0.1	<0.001
Total digestible nutrients (TDN), % of DM	74.2^{ac}	74.4^{a}	73.3^{abc}	72.3^{c}	71.6^{b}		0.004
	(73.2 to 75.2)[1]	(73.4 to 75.4)[1]	(72.3 to 74.3)[1]	(71.4 to 73.3)[1]	(70.7 to 72.6)[1]		
Acid detergent fiber, % of DM	23.6^{b}	23.8^{b}	24.2^{ab}	23.9^{ab}	25.4^{a}	0.3	0.02
Neutral detergent fiber (NDF), % of DM	39.7	39.2	39.3	40.4	41.1	0.7	0.33
Acid detergent lignin, % of DM	2.14^{bc}	1.91^{c}	2.46^{b}	2.97^{a}	2.97^{a}	0.1	<0.001
Nonstructural carbohydrates (NSC), % of DM	32.1	30.3	32.0	31.9	32.6	1.1	0.65
Ash, % of DM	3.9	4.6	4.5	4.3	4.8	0.2	0.07
pH	3.80^{b}	3.72^{c}	3.82^{b}	3.85^{ab}	3.90^{a}	0.01	<0.001
Lactic, % of DM	4.19^{b}	4.82^{a}	3.99^{b}	2.97^{c}	4.04^{b}		<0.001
	(3.94 to 4.49)[1]	(4.52 to 5.19)[1]	(3.76 to 4.27)[1]	(2.82 to 3.15)[1]	(3.80 to 4.32)[1]		
Acetic, % of DM	2.88	2.80	3.24	2.98	3.39	0.2	0.34
Ammonia, % of CP	9.6^{ab}	9.3^{b}	9.5^{ab}	10.5^{a}	10.4^{ab}	0.3	0.03
Dry matter recovery, %	93.9^{ab}	91.2^{b}	91.6^{b}	91.7^{b}	95.3^{a}	0.8	0.01

^{abcd} Least squares means within a row without a common superscript differ ($P \leq 0.05$).

[1] 95% confidence interval reported since original data were not normally distributed and were subsequently transformed for ANCOVA.

Table A4. Forage quality measures after 90 days of fermentation for hybrids grown at Miner Institute, Chazy, NY, BMR/non-BMR corn silage project, NNY, 2017.

	Hybrids						*P*-value
Item	1	2	3	4	5	SE	Treatment
Dry matter, %	30.6^{abc}	25.6^{d}	28.5^{c}	32.4^{ab}	30.6^{bc}	0.6	<0.001
Starch, % of DM	32.7	27.6	31.3	31.5	31.3	1.4	0.18
7-h starch digestibility, % of starch	64.6	73.7	68.6	66.4	69.7	2.1	0.08
Crude protein (CP), % of DM	7.9^{b}	7.7^{b}	8.5^{a}	7.6^{b}	6.9^{c}	0.1	<0.001
Soluble protein, % of DM	4.2^{ab}	4.2^{ab}	4.6^{a}	4.1^{b}	3.9^{b}	0.1	0.01
Total digestible nutrients (TDN), % of DM	74.3^{a}	73.7^{ab}	73.8^{ab}	72.3^{ab}	71.6^{b}	0.5	0.01
Acid detergent fiber, % of DM	22.9	24.4	23.5	24.7	26.0	0.7	0.08
Neutral detergent fiber (NDF), % of DM	39.2	41.3	38.8	41.3	41.1	1.0	0.28
Acid detergent lignin, % of DM	2.01^{c}	2.02^{c}	2.34^{c}	2.81^{b}	3.35^{a}	0.1	<0.001
Nonstructural carbohydrates (NSC), % of DM	33.2	28.1	31.9	31.7	31.4	1.3	0.15
Ash, % of DM	4.0	4.4	4.3	4.1	4.2	0.1	0.47
pH	3.86^{bc}	3.76^{c}	3.93^{b}	3.97^{ab}	3.99^{ab}	0.02	<0.001
Lactic, % of DM	3.00^{ab}	3.70^{a}	2.85^{b}	1.73^{c}	2.75^{b}	0.2	<0.001
Acetic, % of DM	3.84^{b}	5.31^{a}	5.21^{a}	5.02^{a}	4.93^{a}	0.2	0.01
Ammonia, % of CP	9.7^{b}	10.4^{ab}	11.2^{a}	11.3^{a}	11.2^{a}	0.3	0.01
Dry matter recovery, %	91.2^{ab}	87.9^{b}	88.2^{ab}	88.4^{ab}	91.5^{a}	0.9	0.01

[abcd] Least squares means within a row without a common superscript differ ($P \leq 0.05$).

[1] 95% confidence interval reported since original data were not normally distributed and were subsequently transformed for ANCOVA.

Table A5. Forage quality measures after 120 days of fermentation for hybrids grown at Miner Institute, Chazy, NY, BMR/non-BMR corn silage project, NNY, 2017.

	Hybrids						*P*-value
Item	1	2	3	4	5	SE	Treatment
Dry matter, %	29.3^{bc}	24.8^{d}	28.1^{c}	32.8^{a}	31.5^{ab}	0.6	<0.001
Starch, % of DM	33.2	28.9	31.0	32.2	31.6	1.3	0.27
7-h starch digestibility, % of starch	65.2^{c}	74.7^{a}	70.3^{ac}	64.9^{bc}	72.6^{a}	1.2	<0.001
Crude protein (CP), % of DM	8.3^{ab}	8.1^{b}	8.7^{a}	7.8^{b}	7.2^{c}	0.1	<0.001
Soluble protein, % of DM	4.1^{b}	4.6^{b}	5.2^{a}	4.5^{b}	4.5^{b}	0.1	0.002
Total digestible nutrients (TDN), % of DM	74.1^{a}	74.0^{a}	74.0^{a}	72.6^{ab}	72.1^{b}	0.4	0.01
Acid detergent fiber, % of DM	23.8^{b}	24.7^{ab}	23.9^{b}	24.4^{ab}	25.8^{a}	0.4	0.01
Neutral detergent fiber (aNDFom), % of DM	39.6	40.8	39.4	41.1	41.6	0.7	0.22
30-h aNDF digestibility, % of aNDFom	68.8^{a}	71.1^{a}	62.8^{b}	59.1^{b}	59.9^{b}	1.0	<0.001
Undigested NDF 30-h, % of DM	12.4^{c}	11.8^{c}	14.6^{b}	16.8^{a}	16.6^{a}	0.4	<0.001
Undigested NDF 120-h, % of DM	9.1^{c}	7.9^{c}	10.9^{b}	12.8^{a}	12.7^{a}	0.4	<0.001
Undigested NDF 240-h, % of DM	8.9^{c}	7.7^{c}	10.7^{b}	12.5^{a}	12.4^{ab}	0.4	<0.001
Potentially digestible NDF (pdNDF), % of DM	30.8^{ab}	33.1^{a}	28.7^{b}	28.6^{b}	29.1^{b}	0.9	0.02
Acid detergent lignin, % of DM	2.10^{bc}	1.99^{c}	2.35^{b}	2.85^{a}	3.07^{a}	0.07	<0.001
Nonstructural carbohydrates (NSC), % of DM	33.7	29.5	31.5	32.3	31.6	1.2	0.24
Ash, % of DM	4.2	4.6	4.2	4.1	4.3	0.2	0.48
pH	4.02^{ab}	3.89^{b}	4.03^{ab}	4.07^{a}	4.08^{a}	0.03	0.02
Lactic, % of DM	2.40	3.63	3.03	1.85	3.50	0.5	0.11
Acetic, % of DM	10.12^{ab}	10.84^{a}	9.29^{ab}	7.68^{ab}	7.02^{b}	0.7	0.02
Ammonia, % of CP	15.2	16.2	17.6	17.8	17.4	0.6	0.05
Dry matter recovery, %	88.1^{b}	85.7^{b}	87.8^{b}	89.4^{ab}	93.7^{a}	1.0	0.002

[abcd] Least squares means within a row without a common superscript differ ($P \leq 0.05$).

[1] 95% confidence interval reported since original data were not normally distributed and were subsequently transformed for ANCOVA.