

Pasture Quality At Shelburne Farms - 2005



For the 2005 growing season, Shelburne Farms (Shelburne, VT) tracked changes in forage quality of their management intensively grazed (MIG) pastures. These pastures represented mixed species including orchardgrass, Kentucky bluegrass, white clover, timothy, tall fescue and some perennial ryegrass. Samples were collected once a week from the paddock that was to be grazed next in the sequence. Each measurement represented samples that were pooled from 6 to 8 subsamples randomly collected from the paddock. Cutting height depended on the species being sampled and represented what the cows were grazing. For instance, a bluegrass/white clover mix was cut at a lower height (to about 2 inches) than orchardgrass (about 4 inches) since that was what the animals were observed doing. Forage analysis was determined at the University of Vermont Agricultural Testing Lab using NIR technology.

Measurement		Sample Date							
	Unit	3-May	10-May	17-May	24-May	31-May	7-Jun	14-Jun	21-Jun
DM	% "as is"	15.9	18.5	21.9	20.5	19.8	21.4	19.2	18.3
CP	% of DM	27.8	29.3	21.3	21.5	24.1	21.0	25.3	28.0
SP	% of CP	55.4	49.3	51.5	51.5	44.8	49.4	46.2	45.0
ADF	% of DM	16.1	20.7	26.7	25.8	26.9	32.2	33.3	27.3
NDF	% of DM	28.2	37.3	42.3	41.7	48.5	54.3	56.1	46.8
NEI	Mcal/lb	0.70	0.70	0.68	0.70	0.68	0.60	0.59	0.68
TDN	% of DM	79.7	76	71	72	71	66	66	71
Ca	% of DM	0.32	0.38	0.52	0.65	0.24	0.44	0.40	0.65
P	% of DM	0.40	0.46	0.40	0.40	0.41	0.43	0.50	0.48
K	% of DM	3.66	3.85	2.92	2.74	3.13	3.44	4.09	3.64
Mg	% of DM	0.18	0.21	0.20	0.21	0.15	0.22	0.20	0.23
Pasture Description					7.5' tall, Bluegrass/white clover 30%, 1st rotation	10.9" tall, Orchardgrass/white clover (15%), 2nd rotation	8.3' tall, Bluegrass/white clover 30%, 2nd rotation	Bluegrass/orchardgrass, w. clover 20% 3rd rotation clipped	Bluegrass/orchardgrass wh clover 20% 3rd rotation clipped

Measurement		Sample Date							
	Unit	28-Jun	6-Jul	12-Jul	19-Jul	26-Jul	9-Aug	16-Aug	31-Aug
DM	% "as is"	19.8	18.4	18.6	17.7	23.5	18.3	17.5	20.3
CP	% of DM	26.2	25.3	20.8	24.3	22.5	29.1	31.3	27.7
SP	% of CP	35.0	38.2	38.3	37.1	34.3	38.5	37.2	43.7
ADF	% of DM	31.0	27.7	29.1	24.3	25.0	25.5	24.5	28.7
NDF	% of DM	53.9	45.9	50.8	43.8	41.9	45.3	43.5	47.4
NEI	Mcal/lb	0.62	0.67	0.65	0.70	0.70	0.70	0.70	0.65
TDN	% of DM	68	71	69	73	73	72	73	70
Ca	% of DM	0.62	1.01	0.48	0.78	0.71	0.83	0.96	0.59
P	% of DM	0.37	0.45	0.35	0.40	0.35	0.46	0.42	0.48
K	% of DM	3.65	3.61	3.88	3.59	3.78	3.99	3.64	4.06
Mg	% of DM	0.25	0.27	0.21	0.24	0.24	0.26	0.29	0.24
Pasture Description		Tall fescue Bluegrass Orchardgrass wh clover 20% 3rd rotation clipped	7.2" tall Tall fescue Bluegrass wh clover 30% 3rd rotation clipped once	8.6" tall Orchardgrass Bluegrass wh clover 15% 4th rotation	11" tall Fescue, timothy red clover 50% 2nd rotation previously hayed	7" tall Fescue, bluegrass wh clover 15% 4th rotation hayed once	7.8" tall orchardgrass wh clover 25% 5th rotation clipped 2x	8.2" tall orchardgrass timothy red clover 50% Cipped 2x	7th rotation Orchardgrass Bluegrass Clover 40% Cipped 2x

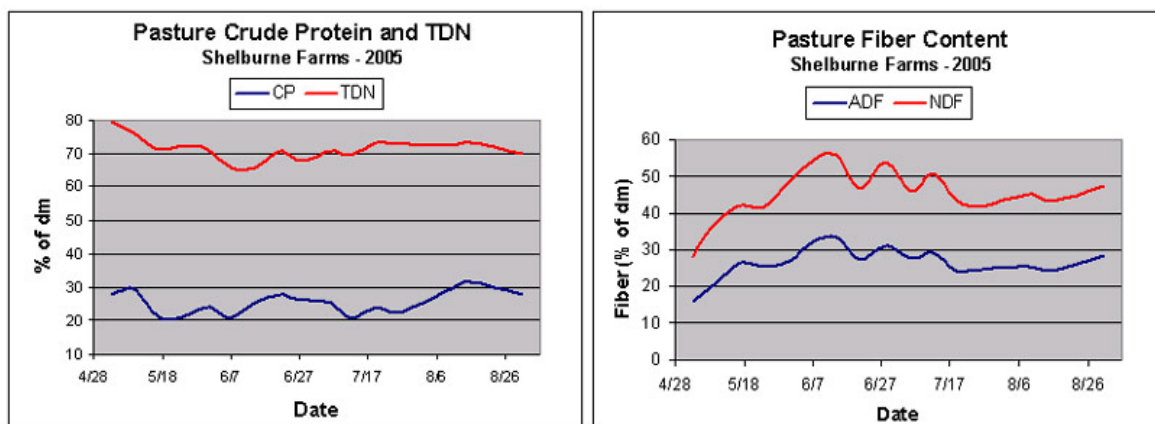


Figure 1. Changes in crude protein (CP), total digestible nutrients (TDN), acid detergent fiber (ADF) and neutral detergent fiber (NDF) content during the grazing season.

Quality Terms

Crude Protein (CP): Total nitrogen content times 6.25 (reported at % of DM)

Acid Detergent Insoluble Crude Protein (ADICP): Also called Bound Protein. The protein bound to the acid detergent fiber fraction of the feed. Protein that has been heat damaged and is unavailable to the animal. About 1% is naturally occurring in forages. (reported as both % of DM and % of CP)

Soluble Protein (SP): The protein fraction that is rapidly broken down in the rumen. (reported as a % of the CP).

Acid Detergent Fiber (ADF): This value refers to the cell wall portions of the forage that are made up of cellulose & lignin. These values are important because they reflect the ability of an animal to digest the forage. As the ADF increases, digestibility of the forage decreases along with the energy.

Neutral Detergent Fiber (NDF): This value is the total cell wall, which is comprised of the ADF portion plus hemicellulose. These values are important in ration formulation because they reflect the amount of forage the animal can consume.

Net Energy Lactation (NE_L): The energy value of the feed for milk production, expressed as megacalories (Mcal) per pound of feed. It is calculated from the ADF of the feed. Different forages use different equations to determine NEI, therefore correctly identifying forages is important (i.e. grass, mixed grass/legume, or legume haylages).

Total Digestible Nutrients (TDN): An older system of estimating the energy value of a feed. Equations also differ depending on type of forage.

Calcium (Ca)

Phosphorus (P)

Potassium (K)

Magnesium (Mg)

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