

Table 1. Utility of various forage tests, test result ranges from Upper Midwest testing labs, desired forage test results for milking and dry cows.

| Test | Common Abbreviations | Common Units Of Expression | DMI Prediction | Energy Estimates, TDN, NEL | Ration Balancing | Nutritional Diagnostics | Supplement Strategies | Quality Indexing | Agronomic Trials | Range--Upper Midwest Testing Labs ¹ | | | Desired Content Within Range- Milking Cows | Desired Content Within Range- Dry Cows |
|--|---|------------------------------------|----------------|----------------------------|------------------|-------------------------|-----------------------|------------------|------------------|--|------------------|-------------|--|--|
| | | | | | | | | | | Legume-Grass Silages | Legume-Grass Hay | Corn Silage | | |
| Crude Protein | CP | % of DM | | x | x | x | x | | | 9 - 25 | 13 - 25 | 5 - 10 | Mid-Upper | Mid |
| Soluble Protein | Sol-CP | % of CP | | | | x | x | | | 21 - 77 | 35-47 | 21 - 45 | Mid | Mid |
| Acid Detergent Fiber Crude Protein | ADF-CP, ADIN | % of CP, % of DM ² | | x | | x | | | | 0.1 - 2.3 | 0.2 - 1.3 | 0.2 - 0.7 | Lower | Lower |
| Neutral Detergent Fiber Crude Protein | NDF-CP | % of DM | | x | | | | | | 1 - 9 | 2 - 5 | 0.5 - 2.3 | Lower | Lower |
| Rumen Undegradable Protein | RUP | % of CP | | | x | x | x | | | 16 - 39 | 13 - 45 | na | Mid | Mid |
| Acid Detergent Fiber | ADF | % of DM | | obsolete | | | | obsolete | | obsolete | obsolete | obsolete | | |
| Neutral Detergent Fiber | NDF | % of DM | x | x | x | x | x | | | 32 - 71 | 30 - 71 | 30 - 62 | Lower | Mid |
| Neutral Detergent Fiber Digestibility | NDFD | % of NDF (30 or 48 h) ³ | x | x | | x | x | | | 33 - 79 | 36 - 75 | 44 - 72 | Upper | Mid |
| Lignin | Lignin | % of DM | | x | | | | | | 3 - 10 | 5 - 10 | 2 - 6 | Lower | Lower |
| Lignin | Lignin | % of NDF | | x | | | | | | 5 - 23 | 11 - 23 | 4 - 16 | Lower | Lower |
| Fat | EE, Fat | % of DM | | x | x | x | x | | | 1 - 4 | 1 - 4 | 1 - 4 | Mid | Mid |
| Non-fiber carbohydrate | NFC | % of DM | | x | x | x | x | | | 7 - 34 | 10 - 38 | 24 - 54 | Mid-Upper | Mid |
| Starch | Starch | % of DM | | x | | x | x | | | d | d | 7 - 38 | Mid-Upper | Mid |
| Starch Digestibility (DSA) | DSA | % of Starch | | x | | x | x | | | d | d | 83-98 | Upper | Mid-Upper |
| Sugars | Sugars | % of DM | | | | x | x | | | 4-8 | 8-11 | 2-5 | Mid-Upper | Mid-Upper |
| Ash | Ash | % of DM | | x | | x | x | | | 6 - 16 | 7 - 16 | 3 - 14 | Lower | Lower |
| Calcium | Ca | % of DM | | | x | x | x | | | 0.3 - 1.6 | 0.5 - 1.7 | 0.1 - 0.4 | Upper | Mid |
| Phosphorus | P | % of DM | | | x | x | x | | | 0.16 - 0.53 | 0.08 - 0.40 | 0.15 - 0.23 | Mid | Mid |
| Potassium | K | % of DM | | | x | x | x | | | 1.1 - 3.8 | 0.7 - 3.7 | 0.7 - 1.7 | Mid-Lower | Lower |
| Magnesium | Mg | % of DM | | | x | x | x | | | 0.19 - 0.40 | 0.18 - 0.41 | 0.12 - 0.26 | Upper | Upper |
| Sodium | Na | % of DM | | | x | x | x | | | 0.01 - 0.14 | 0.01 - 0.12 | 0.05 - 0.09 | Mid | Mid |
| Chlorine | Cl | % of DM | | | x | x | x | | | 0.26 - 1.25 | 0.08 - 0.83 | 0.10 - 0.40 | Mid | Upper |
| Sulfur | S | % of DM | | | x | x | x | | | 0.13 - 0.38 | 0.10 - 0.39 | 0.05 - 0.20 | Upper | Upper |
| Total Digestible Nutrients | TDN | % of DM | | | x | | x | | | 47 - 72 | 49 - 70 | 42 - 76 | Upper | Mid |
| Net Energy ⁴ Lactation, Maintenance, Gain | NE _L NE _m NE _G | Mcal/lb | | | x | | x | | | 0.47 - 0.75 | 0.49 - 0.72 | 0.72 - 0.78 | Upper | Mid |
| Particle Size | MPL, % on screen | mm or cm, % on screen | | | | x | x | | | na | na | na | | |
| Relative Feed Value | RFV | unitless index | | | | | | obsolete | | obsolete | obsolete | obsolete | | |
| Relative Forage Quality | RFQ | unitless index | | | | | | x | | 63 - 230 | 69 - 237 | na | Mid-Upper | Mid |
| Corn Silage Processing Score | KPS | % starch passing 4.75 mm screen | | | | x | | | | na | na | 40 - 80 | Mid-Upper | Mid |
| Fermentation Profile | pH, Lactate, acetate, etc. | pH or % of DM | | | | x | | | | na | na | na | | |
| In Vitro True Dry Matter Digestibility | IV TDMD, IV DMD | % of DM | | | | | | | x | na | na | na | | |
| Milk per ton | Milk/Ton | lbs/ton | | | | | | x | x | 1650 - 3801 | 1790 - 3437 | 2200 - 3600 | Upper | Mid |
| Milk per acre | Milk/Acre | lbs/acre | | | | | | x | x | na | na | na | | |

¹ d= devoid of the nutrient, na = not available for summary.

² Values are expressed as a percentage of DM

³ Values are 48 h NDFD

⁴ Values expressed are Net Energy Lactation at 3X maintenance