SOIL, PLANT AND PEST CENTER
5201 Marchant Drive
Nashville, TN 37211-5112
615.832.5850 fax 615.832.4936
soilplantpestcenter@tennessee.edu

UTEXTENSION
INSTITUTE OF AGRICULTURE
THE UNIVERSITY OF TENNESSEE

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David Jones
1056 Hwy 131
Thornhill TN 37881

Sample ID		**JhC-10**
County		**Hancock**
Lab Number		**103518**
Sample Type		**Fes/OG/Tim**
Test Type		**Horse PRO**
Moisture	%	10.22
Dry Matter (DM)	%	89.78
Relative Forage Quality (RFQ)	<90 - ≥140	206
Crude Protein (CP)	%	14.15
Acid Detergent Fiber (ADF)	%	34.64
Neutral Detergent Fiber (NDF)	%	60.53
Digestible Energy (DE)	MCal/kg	2.24
Non-Structural Carbohydrates (NSC)	%	10.56
Water Soluble Carbohydrates (WSC)	%	10.45
Lignin	%	5.18
Sugar	%	9.18
Fructan	%	0.22
Starch	%	0.10
Ash	%	4.79
Calcium (Ca)	%	0.34
Phosphorus (P)	%	0.20
Magnesium (Mg)	%	0.29
Potassium (K)	%	2.07
Copper (Cu)	ppm	6
Zinc (Zn)	ppm	25
Manganese (Mn)	ppm	42

**All values reported on a 100% DM Basis*

Fed at 2% body weight, this hay is adequate in protein and energy for maintenance and light work. Horses worked heavier will require additional energy. Although adequate for pregnant mares, lactating animals will need additional protein and energy. Hay is not adequate for growing stock therefore supplementation is

necessary.

For more information, please visit us on the web at **https://ag.tennessee.edu/spp**. *If you have any questions with regard to the above information, contact your local Extension Agent.*

SP 774
(available online only)

Forage Analysis Definitions

Gary Bates, Director, UT Beef and Forage Center
Augustin Rius, Assistant Professor, Department of Animal Science
Justin Rhinehart, Associate Professor, Department of Animal Science
Renata Nave, Assistant Professor, Department of Plant Sciences
Travis Mulliniks, Assistant Professor, Department of Animal Science
David McIntosh, Coordinator, UT Beef and Forage Center

Moisture — The percentage of the forage that is water.

Dry Matter (DM) — The percentage of the forage that is not water.

Relative Feed Quality (RFQ) — Value developed to compare forage samples on their overall forage quality. Takes into account energy and fiber digestibility. **Premium >140, Good 110-139, Fair 90–109, Utility <90**

Crude Protein (CP) — The total amount of nitrogen contained in a forage; percent nitrogen is multiplied by 6.25 to obtain crude protein. Crude protein is a mixture of true protein and nonprotein nitrogen; it is used to indicate the ability of the forage to meet an animal's protein needs. **Grass hay average: 8-14 percent**

Neutral Detergent Fiber (NDF) — Indicates the proportion of cell wall material in forage (e.g., primarily structural carbohydrates). Only gut microbes have the enzymes to break it down and make it partially available to animals. It is comprised of cellulose, hemicellulose, lignin, cutin, pectin and unavailable protein. The NDF value might be used to predict forage intake with a low NDF indicating greater forage intake by livestock. **Grass hay average: 45-70 percent**

Acid Detergent Fiber (ADF) — The proportion of highly indigestible plant material in forage; it is comprised of cellulose, lignin, cutin, silica and unavailable protein. It is negatively correlated to digestibility and therefore can be used to calculate dry matter digestibility and feedstuff energy value (e.g., digestible energy and total digestible nutrients). A low ADF value indicates greater digestibility. **Grass hay average: 30-50 percent**

Energy Terminology: Energy content can be expressed as the following estimates based upon feed type (e.g., tall fescue, corn grain) and the animal's requirement (e.g., growing steer, lactating dairy cow).

- **Total Digestible Nutrients (TDN)** Expressed in units of weight (e.g., lb) or the percent of the ration and indicates the digestible energy available to the animal (i.e., intake of feedstuff energy minus energy lost in the feces). TDN is the proportion of the forage that is digestible organic compounds (protein, fiber, fat).
- **Digestible Energy (DE)** The net energy available to an animal after the utilization of some energy in the processes of digestion and absorption and the loss of some of the material as being undigested or indigestible.

The **Net Energy** system is an alternative method to evaluate feedstuffs, and the animal requirement energy value is expressed as NEm, NEg or NEl. The use of the NE procedure is based on the fact that feedstuffs given to animals have different fuel values depending on whether they are being used for maintenance component (NEm) or production component (NEg and NEl).

- **Net Energy for Maintenance (NEm)** Estimate of the energy content to be used for maintenance.
- **Net Energy for Gain (NEg)** Estimate of the energy content used for gain.
- **Net Energy for Lactation (NEl)** Estimate of the energy that is available to the animal to be used for maintenance, pregnancy and lactation.

***in-vitro* True DM Digestibility 48h (IVTDMD48h)** — An estimate of the percentage of the forage that is digestible.

Non-Structural Carbohydrates (NSC) — Percentage of forage that is simple sugars and not cell wall components.

Non-Fiber Carbohydrates (NFC) — The same as NSC.

Water Soluble Carbohydrates (WSC) — Percentage of forage that is carbohydrates soluble in water.

Lignin — Indigestible fiber component of the cell wall.

Sugars — Digestible mono- and disaccharides.

Fructan — Estimates of short-chained sugar polymers. Highly digestible energy source.

Starch — Estimate of the starch content of forage.

Ash — The percentage of forage that is made up of minerals. **Grass hay average: 5-10 percent**

Calcium (Ca) — Estimate of the calcium content of forage. **Grass hay average: 0.3-0 .7 percent**

Phosphorus (P) — Estimate of the phosphorous content of forage. **Grass hay average: 0.15-0.25 percent**

Magnesium (Mg) — Estimate of magnesium content of forage. **Grass hay average: 0.15-0.25 percent**

Potassium (K) — Estimate of the potassium content of forage. **Grass hay average: 1.25-2.25 percent**

Copper (Cu) — Estimate of the copper content of forage. **Grass hay average: 7-11 ppm**

Zinc (Zn) — Estimate of the zinc content of forage. **Grass hay average: 20-25 ppm**

Manganese (Mn) — Estimate of the manganese content of forage. **Grass hay average: 40-70 ppm**

Sulfur (S) — Estimate of the sulfur content of forage. **Grass hay average: 0.1-0.3 percent**

Nitrates — Estimates of the nitrate content of forage. Levels above 2,500 ppm can be toxic to ruminants.

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