

# FACT SHEET



NF-AS-02-01

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**LIVESTOCK**

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## Understanding and Interpreting Noble Foundation Forage Tests

The Noble Foundation offers feed and forage testing services to interested farmers and ranchers. The value of testing hay and/or forage is enormous, while the cost is minimal. This fact sheet shows how to interpret the results of a hay analysis from the Noble Foundation.


### Sample Information

The quality of the results is directly influenced by the quality of the sample and the information provided about it. The Foundation publication "Sampling Hay and Standing Forage" (NF-FO-97-02) reviews hay and forage sampling procedures and is available by calling (580) 223-5810. When submitting a sample, fill out the sample information sheet shown in Figure 1. Identify the sample so that it's clear which forage it represents (example: 2<sup>nd</sup> cutting - Thomas Place). Indicate what plant (bermudagrass, native grasses, alfalfa, etc.) and type (hay, standing forage, silage) of forage it is. This information allows for a more precise analysis and more accurate supplementation recommendations.

Figure 1.



The Noble Foundation  
P.O. Box 2180, 2510 Sam Noble Parkway  
Ardmore, OK 73402  
(580) 223-5810



## Forage Sample Information

Name: \_\_\_\_\_ Ranch Name: \_\_\_\_\_

Address: \_\_\_\_\_ Phone: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Lab Use Only	Sample I.D.	Forage Type	Test	Animal Code*
Example	North 40 - 2 <sup>nd</sup> cutting	Alfalfa Hay	F	3, 18, 38

\*See reverse for animal codes. Available only with roughages using Tests E, F, G, and H.

Test	Description	Price*	Minerals included
A.	Crude Protein Only	\$4.00	
B.	Crude Protein and Nitrate (NO <sub>3</sub> )	\$8.00	
C.	Crude Protein & macro minerals	\$10.00	Ca, P, K, Mg
D.	Crude Protein & all minerals	\$14.00	Ca, P, K, Mg, Zn, Fe, Mn, Cu
E.	Crude Protein, ADF (TDN)	\$10.00	
F.	Crude Protein, ADF (TDN) & NDF	\$15.00	
G.	Crude Protein, ADF (TDN), NDF, & all minerals	\$28.00	Ca, P, K, Mg, Zn, Fe, Mn, Cu, & S
H.	Crude Protein, ADF (TDN), NDF, and macro mineral	\$19.00	Ca, P

\* No charge for Noble Foundation cooperates.

All analyses performed by: Ward Laboratory, 4007 Cherry Ave. / P.O. Box 788, Kearny, NE 68848-0788  
Ward Laboratory will also bill you for analysis services. The Noble Foundation accepts no money for testing services.

Then determine which analysis package will meet your needs. The available tests and their prices are:

Test Description	Price*	Minerals included
A. Crude Protein Only	\$4.00	
B. Crude Protein and Nitrate-N (NO3-N)	\$8.00	
C. Crude Protein & macro minerals	\$10.00	Ca, P, K, Mg
D. Crude Protein & all minerals	\$14.00	Ca, P, K, Mg, Zn, Fe, Mn, Cu
<b>E. Crude Protein &amp; ADF (TDN)</b>	<b>\$10.00</b>	
<b>F. Crude Protein, ADF (TDN) &amp; NDF (RFV)</b>	<b>\$15.00</b>	
<b>G. Crude Protein, ADF (TDN), NDF (RFV), &amp; all minerals</b>	<b>\$28.00</b>	<b>Ca, P, K, Mg, Zn, Fe, Mn, Cu, &amp; S</b>
<b>H. Crude Protein, ADF (TDN), NDF (RFV), &amp; macro minerals</b>	<b>\$19.00</b>	<b>Ca, P</b>

\*There is no charge for testing services for Noble Foundation cooperators.

Do not pay for information that won't be used. Therefore, if you are only interested in crude protein, select test A. If you need to evaluate protein and energy (TDN), which is recommended, select test E. If you have alfalfa hay and want to know relative feed value (RFV), select tests F, G or H.

Tests E through H allows you to indicate the type of animal consuming the forage. The list of animals is on the back of the sample information sheet. Locate the animals you would like to use and enter the corresponding code number into the sample information. Noble Foundation Specialists will calculate supplemental feeding recommendations (if necessary) for that situation.


### Results

After the information sheet is completed and turned in with the sample, the sample is processed and mailed to Ward Laboratories in Kearney, Neb., for analysis. Results will be mailed to you, along with a bill from Ward Labs, in about 10 to 14 days. (Foundation cooperators will not receive a bill.)

The results will look like this:

**Sample Information** →

**Results** →



**Agricultural Testing Services**  
The Hummel-Baker-Noble Foundation, Inc.  
2519 East Noble Highway P.O. Box 2100  
Lawton, Oklahoma 74042 Telephone (806) 225-3600

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Sample Description: 2-Gar Hay      Jeffrey Roster      Sample Type: Roughage  
Lab Number: 47482      Date: 6/19/02      15416 W. OKC Hwy      Crop:      Out Hay  
County: OK-Comanche      El Reno, OK 74044      Test Fees:      Test F

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	Dry Matter (%)	Moisture (%)	Crude Protein (%)	ADF (%)	NDF (%)	TDN (%)	RFV	Water Solubles (%)
As Fed	89.4	10.6	4.3	44.3	68.8	44.9		
On Hay			4.9	45.2	71.4	52.3		

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**Sample Results**

Cattle Type	Nutrient Requirements					Nutrient Deficiency					Nutrient Deficiency
	CP (%)	TDN (%)	ADF (%)	CP (%)	TDN (%)	CP (%)	TDN (%)	ADF (%)	CP (%)	TDN (%)	
1200 lb Mature Cow, Early Lactation, Supreme Milk Production	1.19	17.3	24.3	1.01	4.77				None	0.21	<b>A</b>
Supplements	As Fed	CP (%)	TDN (%)	Cost	Lib. to Feed	Cost	Lib. to Feed	Cost	Lib. to Feed	Cost	
30% Range Cubes**	18	61	\$172	N/A	N/A	30% Range Cubes	18	61	\$172	0.3	\$0.04
80% Range Cubes**	34	65	\$290	N/A	N/A	80% Range Cubes	34	65	\$290	0.5	\$0.06
Suphan Meal**	47	75	\$165	N/A	N/A	Suphan Meal	47	75	\$165	0.4	\$0.09
Continued Meal**	42	69	\$212	N/A	N/A	Continued Meal	42	69	\$212	0.4	\$0.05
Suphan Hails**	11	73	\$90	N/A	N/A	Suphan Hails	11	73	\$90	0.4	\$0.02
Alfalfa Hay**	15	50	\$80	N/A	N/A	Alfalfa Hay	15	50	\$80	0.6	\$0.02

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Cattle Type	Nutrient Requirements					Nutrient Deficiency					
	CP (%)	TDN (%)	ADF (%)	CP (%)	TDN (%)	CP (%)	TDN (%)	ADF (%)	CP (%)	TDN (%)	
800 lb Yearling Steer (Heifer), Late Gestation, 1.08 ADG	1.41	9.5	15.7	1.15	2.41						
Supplements	As Fed	CP (%)	TDN (%)	Cost	Lib. to Feed	Cost	Lib. to Feed	Cost	Lib. to Feed	Cost	
30% Range Cubes*	18	61	\$172	3.8	\$6.33	30% Range Cubes*	18	61	\$172	3.8	\$6.33
80% Range Cubes*	34	65	\$290	5.7	\$6.42	80% Range Cubes*	34	65	\$290	5.7	\$6.42
Suphan Meal*	47	75	\$165	3.1	\$6.25	Suphan Meal*	47	75	\$165	3.1	\$6.25
Continued Meal*	42	69	\$212	3.2	\$6.35	Continued Meal*	42	69	\$212	3.2	\$6.35
Suphan Hails*	11	73	\$90	3.2	\$6.14	Suphan Hails*	11	73	\$90	3.2	\$6.14
Alfalfa Hay**	15	50	\$80	N/A	N/A	Alfalfa Hay**	15	50	\$80	N/A	N/A

\* - Use Cattle with this label      \*\* - Supplement not Appropriate  
 Actual CP value should be used for supplemental feeding calculations. This estimate for a range supplement is based on a typical application rate of 100 lbs/acre. Actual CP value should be used for supplemental feeding calculations. Supplemental feeding should be based on actual CP value and not on this estimate. See Ward's website for a complete alfalfa hay quality and nutrient supplementing program.  
 For alfalfa hay and hails, if you have any questions, contact a University Specialist at The Noble Foundation, (806) 225-3600.

Item	Description
Dry Matter %	The percentage of the weight of your forage sample that <i>is not</i> water. Supplement requirements are calculated based on the dry matter percentage of your hay.
Moisture %	The percentage of moisture in the hay sample when it was tested.
Crude Protein (CP)%	The percentage of the hay that can supply nitrogen or amino acids to meet an animal's crude protein requirements.
Acid detergent fiber (ADF)%	The percentage of the hay that is considered to be very slowly digested. It contains cellulose and lignin.
Neutral detergent fiber (NDF) %	The entire fibrous portion of the hay. NDF contains ADF plus some more rapidly digested carbohydrates.
Total digestible nutrients (TDN)%	A calculated value (estimated from ADF) that represents the overall digestibility or energy value of the forage.
Relative Feed Value (RFV)	A calculated value that represents the digestibility and intake potential of the forage. It is calculated from ADF and NDF and is only nutritionally applicable to alfalfa hay fed free choice to dairy cows. RFV is often used in marketing all types of hay.
Dry Matter Intake (DMI)	An estimate of the amount of forage the animal will voluntarily consume if given free access. It is expressed in pounds per day and is estimated from TDN of the forage. Actual DMI may vary considerably due to environmental and other effects.
Nitrate Nitrogen (NO <sub>3</sub> -N)	The following table can be used to interpret nitrate nitrogen results.
<u>NO<sub>3</sub>-N, ppm</u>	<u>Recommendation</u>
0 - 750	Considered safe for all cattle.
751 - 1,150	Considered safe for non-pregnant cattle
1,151 - 2,250	Some risk for all cattle. May cause abortion and decreased growth.
>2,250	Potentially toxic for all cattle. Acute toxicity symptoms, including death.
Request OSU Extension Facts F-2903, "Nitrate Toxicity in Livestock", Oklahoma State University, for more information and suggestions for feeding forage high in nitrate.	

### ***Application***

Results are reported on an as-fed basis on the top line of the results section. These numbers are useful when weighing out forage or supplements to feed cattle. The bottom line of the results section is the analysis on a dry-matter basis. These values represent the forage with the water removed. Dry matter values should be used to calculate supplement needs, to compare one forage to another, or when buying and selling hay.

For a cow-calf producer, two important values are CP and TDN. Beef cow nutrition is commonly discussed in these basic terms.

If you selected tests E through H (which include ADF), our database has calculated CP & TDN deficiencies, and if any deficiencies exist, recommended supplements for the animals you selected. Default animals will appear if specific animal codes were not indicated when the sample was submitted. Default animals are:

(continued on next page)

- \* 1200 lb mature cow, early lactation, average milk production
- \* 1200 lb mature cow, middle gestation
- \* 800 lb yearling bred heifer, late gestation, ADG of 1.0 lb

If there is a deficiency (box A), find the supplement in the list with the lowest cost (box B). This is typically the most economical supplement to use. Prices are updated about every two months, and are an average of feeds available in the Noble Foundation's service area. Check with your feed supplier to confirm supplement prices.

When using supplement recommendations, be aware of the following:

- Actual dry matter intake and nutrient requirements may vary considerably from estimates due to environmental conditions and inherent animal variation.
- You should almost always supplement to meet a CP deficiency, or dry matter intake will be less than expected.
- You should supplement to meet a TDN deficiency when animals need to gain or maintain weight or condition.
- Always provide a quality mineral supplement and adequate clean water.
- Closely monitor cattle performance and body condition to be sure nutrient requirements are being met.

If you have any questions concerning your forage analysis, call a Foundation livestock specialist at (580) 223-5810.

The Samuel Roberts NOBLE FOUNDATION, Inc.  
2510 Sam Noble Parkway  
Ardmore, Oklahoma 73401

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