

valacta

Dairy Knowledge at your fingertips

Forage Analyses



MORE information and MORE precision

Since the Forage Challenge was launched as Valacta's training session in 2013, it is no longer a secret that well preserved, good quality, properly used forage are keys to profitability on the farm. In order for your forages to take their rightful place in your rations, you need to be fully aware of their nutritive value. Forage analyses are an indispensable part of proper feed management on the farm.

Valacta has been offering its forage analysis service to meet your infrared and wet chemistry needs for almost 20 years. We recently decided to collaborate with Cumberland Valley Analytical Services (CVAS), one of the most reputable forage analysis laboratories in the United States.

This collaboration will help us to offer a more complete range of analyses, while maintaining a competitive price. We have also acquired a new, more up to date, infrared analyzer which has been calibrated with equations provided by CVAS. Given the impressive number of analyses run in their laboratory, the CVAS equations will bring more precision to our analysis results.

This collaboration will enable us to analyze both high moisture corn and TMR using infrared analysis which, up to now, were only available by wet chemistry. This means both monetary savings and quicker access to information for you!

Also, if you request the Analyses PLUS service for your infrared analysis, you will gain access to even more precious information:

1. NDF digestibility;
2. Starch digestibility (for corn silage);
3. Silage fermentation profile.

How can this information be useful to you? Read more about it in our special section on forage analyses.

Happy Reading!



SUMMARY

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ANALYSES PLUS: NDF DIGESTIBILITY

Why use infrared PLUS



You already use basic infrared for your silages and you have been happy with that up to now. Do you really need Analyses PLUS? To answer this question you will need to know what new information is available and how it could be useful to you:

- NDF digestibility;
- Starch digestibility;
- Fermentation profile.

Don't we already have information about NDF in the basic analysis?

YES BUT...

In the basic IR analyses, NDF digestibility is calculated using lignin. Lignin is very useful to plants because it enables them to stand upright. It is not useful to cows however, as they cannot digest it. Forages with high lignin content have a lower nutritive value. The more lignin there is, the less digestible the NDF will be. The relationship between

lignin and NDF digestibility isn't perfect however, so when given the choice it is always preferable to measure NDF digestibility directly so that the calculation of a forage's energy contribution will be more precise.

This is precisely what we aim to do with Analyses PLUS. There can be significant variation in NDF digestibility between forages. Since NDF is the most abundant constituent of forage, sometimes 60% or more, its digestibility has an enormous impact

Basic IR or IR PLUS: is there a big difference?

We split a forage sample and analyzed one half using the basic IR analysis and the other using Analyses PLUS. The NDF digestibility results were as follows:

Basic IR Analyses: 43.2% NDF
IR PLUS: 53.2% NDF

In this instance, would the 10% difference in NDF digestibility have a significant impact? Let's look at a group of cows with the following characteristics:

Characteristics	Group Average
Milk (kg/day)	33.1
% Fat	4.37
% Protein	3.33
Weight (kg)	620
DIM	186

Now let's compare the ration recommended by Ration'L for both of the silage analyses described above.

Feed	NDFd 43.2% (Basic IR Analyses)	NDFd 53.2% (IR PLUS Analyses)
Grass Silage	NDFd 43.2	33.563
Grass Silage	NDFd 53.2	34.328
*Corn Silage	12.000	12.000
*Straw	0.400	0.400
Ground Corn	5.969	4.916
Soybean Meal	2.674	2.779
Minerals	0.387	0.379
Total Cost (\$/cow/day)	7.09	6.99
Cost of Concentrates (\$/cow/day) 3.68	3.51	
Forage Costs	3.41	3.47

* Note that the quantities of corn silage and straw were forced "constants" to allow for comparison.



on the forage's energy contribution to the ration. The value provided by Analyses PLUS is more precise and specific to the particular forage being analyzed and therefore adds accuracy to the measure of degradation of the feed in the rumen, making the ration formulation more precise. What a great addition to our range of forage analyses!

So, you were right, NDF digestibility is not new, but IR PLUS is much more precise and reliable. Ration'L, the ration formulation software used by the Valacta advisors, is programmed to use the most reliable NDF digestibility value for your forages, like that provided by the infrared Analyses PLUS. Your cow's rations will therefore be adjusted according to the measured value rather than a calculated value using lignin.

ANALYSES PLUS: STARCH DIGESTIBILITY

This precious information can help you to better gauge the concentrates in your ration

TRUE!

Ideally corn silage should have the highest possible starch digestibility to allow the ration to be balanced using smaller quantities of concentrates. The catch however is that starch digestibility is not fixed and grows over time starting at harvest. It is therefore best to wait at least two months before feeding corn silage to cows.

In fact, if we focus solely on temperature, it would seem that corn silage fermentation only lasts a few days. Although the fermentation may seem to have stopped, the corn silage actually continues to «mature» for several weeks, or months. The availability of starch in the corn silage will increase over time and contribute to an increase in available energy. Some of the proteins inside the grain will also solubilize over time. This will make the starch easier to digest for the cow's rumen bacteria.

Graph 1 shows the variation in starch digestibility and protein solubility of corn silage according to the length of time it has been stored. Starch digestibility increases starting when it is harvested and levels off at the end of December, after around 15 to 18 weeks of storage. Protein solubility increases dramatically at the beginning of the storage period and then later at a slower pace. It stabilizes after having been stored for a little more than 20 weeks. This makes it important to manage your inventory in a way that will take into account the advantages of using mature, stable corn silage in your rations. This will help with the precision of your ration calculations and there will be fewer surprises with regards to MUN.

**Only \$7.50 for
thousands of dollars
of savings per year**



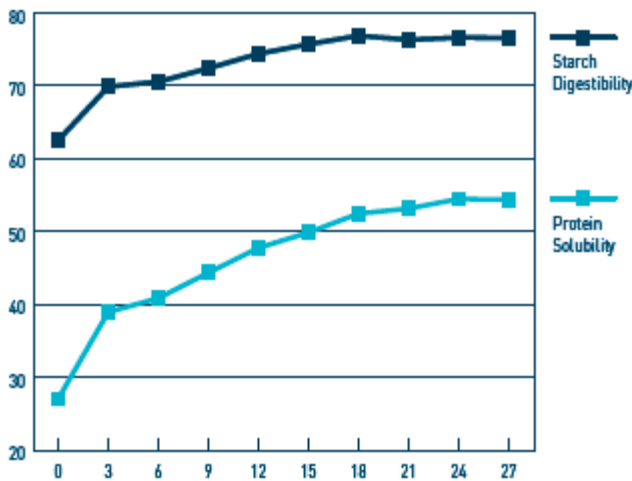
In this example, using IR PLUS to measure NDF digestibility, rather than the theoretical calculation made by the basic IR analyses, will mean that the adjustments made to the ration will save you \$0.10/cow/day. For an average 60 cow herd, this means saving close to \$2,200/year simply by refining your ration recommendations.

Of course, this is only an example, but the values used in this case are values that we could actually expect to see. The possibility for savings would be even greater in situations where several forages are used in the ration and the NDF digestibility is readjusted for more than one feed.

**Analyses PLUS
is part of my
new strategy!**



GRAPH 1: VARIATION IN THE STARCH DIGESTIBILITY AND PROTEIN SOLUBILITY OF PROTEIN IN CORN SILAGE ACCORDING TO LENGTH OF TIME STORED



Source: Cumberland Valley Analytical Services. Technical Notes. March 2013.

Avoid acidosis and underfeeding

Thanks to IR PLUS, you can now measure starch digestibility. This new information at your disposal will enable your advisor to adjust your ration concentrates to avoid acidosis when the digestibility is high, or underfeeding when it is low. This is an effective strategy for managing feed costs while still maximizing the ration's energy content.

SAMPLING QUESTIONS

Q: How often should my silages be tested for dry matter?

R: APPROXIMATELY 1-2 TIMES PER MONTH OR WHEN YOU CHANGE SILOS, LOTS, BATCHES, ETC.

Q: How often should I take samples for silage composition?

R: IT DEPENDS ON THE SIZE OF YOUR HERD. HERE ARE OUR RECOMMENDATIONS:

	Number of cows		
	50	100	200
Interval between samples	30	16	11
Sampling days/month	1	2	3
Number of samples/day/forage	1	2	3
Number of samples/month/forage	1	4	9

FERMENTATION PROFILE

Is that kind of like a report card for my silage?

EXACTLY

Although harvest conditions are not *always* ideal, you do everything in your power to ensure that your silage is properly preserved: through the use of wide or merged windrows, adjusting chop length, regular sharpening of the harvester blades, monitoring moisture, adjusting the kernel processors (Penn State Particle Separator), ensuring timely sealing or wrapping and using the proper additives. The question is: After having invested all of this effort, has the fermentation gone as planned?

To get an answer to this question, many rely on smell, color, or other subjective signs. If the silage looks good, smells good and the cows are eating with appetite and producing well, all of the signs seem to point to well preserved silage. Unfortunately, this isn't *always* the case. There are many factors which can cause fermented forages to deteriorate along the way. It is important to ensure the best possible fermentation process to prevent this deterioration and avoid the potential feeding problems that come with it.

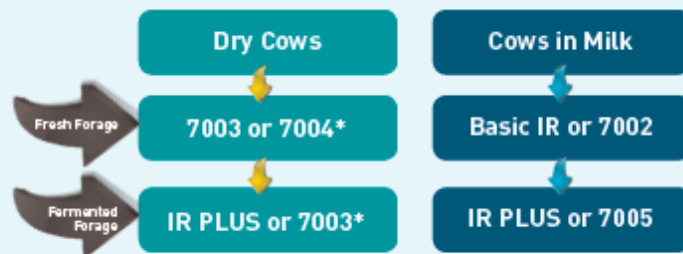
A fermentation profile is an analytical process that allows you to measure the quantities of the main volatile fatty acids (VFA) that are produced during the silage making process. There can be significant variation in VFA levels depending on various factors such as forage type, moisture, the additives used, and the weather before harvest. When fermentation is successful, 65% or more of the VFA's will be lactic acid. At the other end of the scale, the presence of butyric acid indicates poor preservation often caused by excessive moisture. Butyric acid levels should never be more than 0.1% of the VFA.

Analyzing for the different types of VFA's will not only help you to find out if your silage is well preserved, but can also show you where you should look to rectify any problems. It can help you to determine what went wrong so that you can correct it as quickly as possible and keep it from happening again. It will also help your advisor to adjust predicted intake to account for the fact that poorly preserved silage is not well accepted.

A Veritable Buffet of Choices

When it comes time to check off the type of analyses that you want on your forage sample card, there are so many choices that it can be hard to know just what to choose: kind of like at a Chinese food buffet!

Don't worry—your Valacta technician or advisor will know how to point you in the right direction. For those of you who are curious or like to be more autonomous, here are several ways to get the best choices from the menu:



* In herds that have problems with milk fever.

Don't forget your card

A sample should never be without it's card. Be sure that each card is filled in properly and inserted into the specially made pocket on the plastic bag.

CLIENT # [] [] [] [] [] [] *Forage Analyses* EMPLOYEE # [] [] [] [] [] []



Name: _____ Tel.: _____ Email: _____

Address: _____ City: _____ Postal Code: _____

Description: _____

Cut #: _____ Cut/Sampling Date: _____

FORAGE TYPE	<input type="checkbox"/> Fresh Forage	} Indicate Species →	PLANT SPECIES	<input type="checkbox"/> Legume
	<input type="checkbox"/> Dry Hay			<input type="checkbox"/> Legume + Grass
	<input type="checkbox"/> Fermented Forage			<input type="checkbox"/> Grass
<input type="checkbox"/> TMR	<input type="checkbox"/> Whole Plant Corn Silage	<input type="checkbox"/> BMR	<input type="checkbox"/> Sorghum-sudan	
<input type="checkbox"/> Grain (_____)	<input type="checkbox"/> Small Grain Cereal	<input type="checkbox"/> Other (specify)		
<input type="checkbox"/> Other (_____)				

DON'T FORGET TO INDICATE THE REQUESTED ANALYSES ON THE BACK OF THE CARD

FOR LABORATORY USE ONLY

Date Received _____ Batch # _____ Sample # _____

FORAGE ANALYSES

CODE	Choose one of the following	
7002	NIR Analysis	<input type="checkbox"/>
7003	NIR Analysis (7002) + Chemical Analysis (Ca, P, Mg, K, Na, Fe, Mn, Zn, Cu)	<input type="checkbox"/>
7004	NIR Analysis (7002) + Chemical Analysis (Ca, P, Mg, K, Na, Fe, Mn, Zn, Cu, Cl, S)	<input type="checkbox"/>
	NIR Plus Analysis (must also choose one NIR analysis above)	
7005	NDF digestibility, starch and fermentation profile	<input type="checkbox"/>
	Other Analyses	
7006	Wet Chemistry (DM, CP, ADF, NDF, Ca, P, Mg, K, Na, Fe, Mn, Zn, Cu, Ash, pH)	<input type="checkbox"/>
1043	Particle Size (TMR, Forage or Grain)	<input type="checkbox"/>
1046	Mycotoxin Screening DDN	<input type="checkbox"/>
1046	Mycotoxin Screening T-2	<input type="checkbox"/>
1046	Mycotoxin Screening ZEN	<input type="checkbox"/>
	The report should be sent to the client by (check all that apply):	
2033	Mail	<input type="checkbox"/>
2014	Fax: [] [] [] [] [] []	<input type="checkbox"/>
	Email: _____	<input type="checkbox"/>

Comments or Special Instructions:

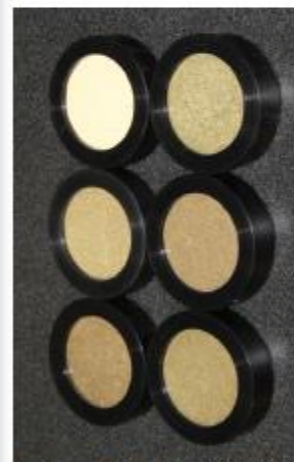
Send to:

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Analyses PLUS samples; dried and ground.

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