## 2022 World Alfalfa Congress

November 14 - 17, 2022

# Opportunities for Global Standardization of Quality Measurement of Alfalfa

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# Quality Measurement

- *First speaker focused on defining quality parameters in alfalfa.*
- *Second speaker offered an approach to put an economic value to quality parameters.*

*This discussion will focus on standardizing the quality assessment of alfalfa.*

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# Forage Quality Measurement – Defining Objectives

- *Inputs for modeling diets (CNCPS, NASEM)*
- *Evaluation of quality for management change*
- *Evaluating for genetic differences in hybrids*
- *Characterization for marketing – optimizing value transfer between buyer and seller*

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# “Optimizing Value Transfer”

*Value transfer is optimized when the buyer and seller don’t have to factor in significant risk associated with a transaction.*

*To minimize risk we must define, standardize, and validate the various aspects of the forage sales transaction process.*

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# Optimizing Value Transfer

The market transaction process:

- **Defining expectations** of the transaction up front, in writing using practical terms – a contract.
- Stating how **quality** is to be defined
  - Quality measurements to be used:  NDF, RFV, RFQ
  - Information to be provided about the lot of forage
  - The lab (or labs) to be used for quality assessment
- **Conflict resolution** – what is the stated plan if buyer and seller expectations don't match.

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# Optimizing Value Transfer

*Value transfer is optimized when parties have confidence in the evaluation of forage quality.*

- *Creating a record of the process*
- *Defining and verifying the sampling process*
- *Having confidence in the lab evaluation*

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# Optimizing Value Transfer

***Creating a record of the process:***

- A definition of the lot being sampled
- Location
- Growing and harvest conditions
- The person sampling and the process used
- Shipping and lab receipt information
- Lab processing details:  date received, amount and condition of the sample, how it was handled, the analysis to be run, the personnel that handled and ran the analysis
- Lab reporting:  standardized and verified reporting of quality indexes, sample and analysis anomalies
- Pictures validating various aspects of the process

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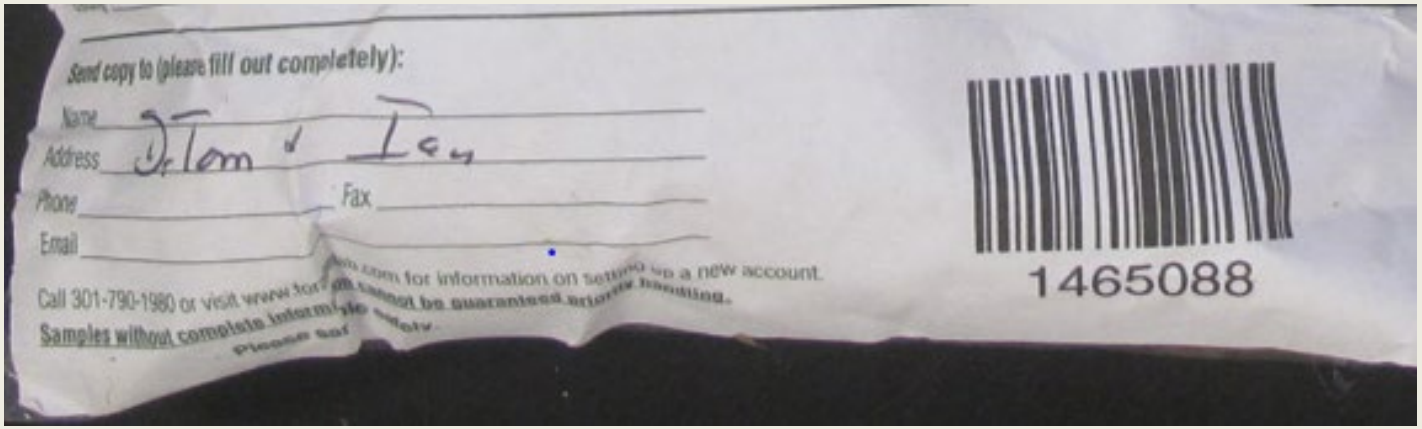
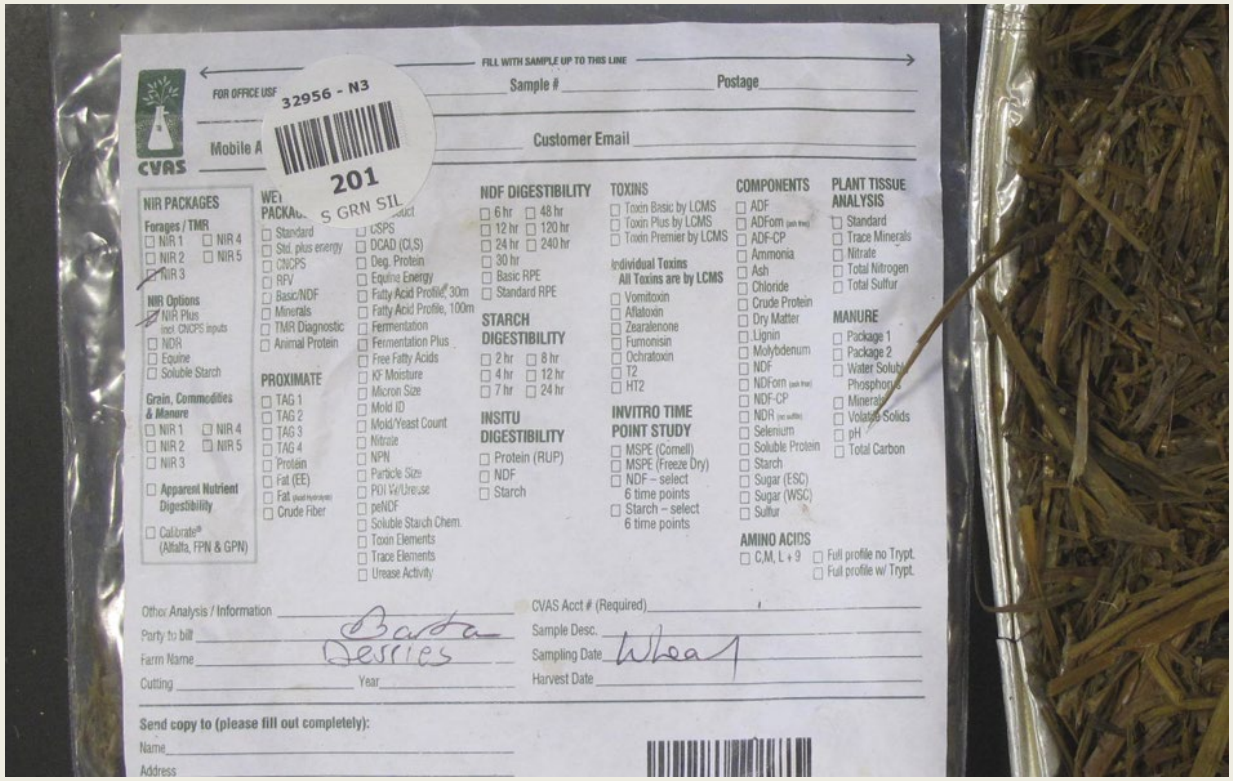
# Optimizing Value



# Optimizing Value



# Optimizing Value Transfer

***Defining and verifying the sampling process:***

- *Sampling is the largest contributor to variation in sample analysis results*.
- Sampling is an issue in the field and in the laboratory.
- Sampling is a science.  Sampling protocols need to be adapted to the specific lot of forage being sampled.
- The sampling protocol should be recorded and should become part of the sample record available to parties involved in a market transaction. If the sampling process is not defined and recorded it does not provide defensible sample!

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## *Sampling resources:*

- Excellent reference on sampling from *Association of American Feed Control Officials (AAFCO)*
- "GOODSamples outlines the scientific and systematic approach to ensure that analytical data generated as a result of a sampling process is representative of the decision unit and is defensible.:
- Free PDF: https://www.aafco.org/Portals/0/SiteContent/Publications/GOODSamples.pdf
- AAFCO website is an excellent resource for anyone involved in forage or feed quality control issues

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# Hay Sampling Certification Exam

**by Dan Putnam and Steve Orloff**

## Introduction

The purpose of this Certification is to aid in standardizing hay testing protocols and to improve your understanding of the sampling and testing process. This is a learning opportunity, not just a test of knowledge. Please follow the steps below. At the end of the exam, you will be able to certify hay samples. There is currently no cost to you for this certification program.

## Step 1: Read the Materials

In particular, read the "Recommended Principles for Proper Hay Sampling" on the next page. You may also want to browse several other helpful publications pertaining to hay testing, especially Understanding Forage Quality, and Interpreting your Hay Testing Report.

## Step 2: Take the Exam

The exam consists of thirty multiple-choice questions. The questions will focus primarily on hay sampling methods, forage quality terms, and interpreting forage quality reports. You must answer all questions correctly to pass the exam. However, you may try as many times as you like, and there are hints provided for each wrong answer. The primary purpose of the exam is not to see how much you know, but to serve as an instructional aid. Also note that incorrectly answered questions will appear again at the end of the exam.

The questions should not be difficult, but there will likely be some that you do not know. When you encounter a question you are not familiar with, look through some of the educational documents we have provided to you.
The exam should take no more than 45 minutes to 1 hour.

## Step 3: Registration

When you finish the exam successfully and confirm your registration information, a certificate page will be generated for you. You may print and duplicate these certificates. Proudly display the main certificate on your wall, and include the sampling certificates with samples you take in the future. If there are any discussions about the quality of your sample--your signed certificate is your assurance that you have sampled the hay according to a standardized protocol.

# Certified Hay Samplers

1 2 3 4 5 6

Enter State Search

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|---|---|---|---|---|---|---|
| 04760 | Saifeldin | Ahmed | Port Sudan | Red Sea | USA | Thu Nov 10 2022 |
| 04759 | María Pilar | Bolea | Esplús | Spain | USA | Thu Nov 10 2022 |
| 04758 | Sifeldin | Ahmed | Port Sudan | Red Sea | USA | Mon Nov 07 2022 |
| 04757 | Evan | Christensen | Logan | UT | USA | Fri Nov 04 2022 |
| 04755 | MARIA PILAR | BOLEA | BARBASTRO | HUESCA | SPAIN | Wed Nov 02 2022 |
| 04754 | Royce Joshua | Escalona | Stockton | CA | USA | Tue Nov 01 2022 |
| 04753 | Eva | Mac | San Francisco | CA | USA | Thu Oct 27 2022 |
| 04752 | Bridget | McBride | Collinston | UT | USA | Wed Oct 26 2022 |
| 04751 | Nicole | DeAraujo | Prince Edward County | ON | Canada | Wed Oct 26 2022 |
| 04750 | Royce Joshua | Escalona | Stockton | CA | USA | Thu Oct 20 2022 |
| 04749 | Muhammad Ibrahim | Qasim | Multan | Pakistan | Pakistan | Mon Oct 17 2022 |
| 04748 | Michel | Pineda | Omaha | NE | USA | Thu Oct 13 2022 |
| 04746 | Greg | Cecil | Eminence | Kentucky | USA | Mon Oct 10 2022 |
| 04745 | Anna | Housley | Logan | Utah | USA | Mon Oct 03 2022 |

# Standardizing Laboratory Analysis

***What is the definition of quality to be used for alfalfa forage?***

- *NDF*
- *RFV (NDF + ADF)*
- *RFQ (CP, EE or FA, NDF, NDFCP, NDFD48, Ash)*
- *NASEM*

# Standardizing Laboratory Analysis

- *In general, the more complex the evaluation scheme the greater the opportunity for sensitivity in defining value.*
- *In general, the more complex the evaluation scheme, the more difficult it is to control lab variation.*
- *For alfalfa as a relatively uniform forage material, nutrients tend to be correlated and greater complexity is not necessarily better.*

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# Standardization of Laboratory Analysis

*What is the expectation of lab services:*

- *Inexpensive?*
- *Fast?*
- *Convenient?*
- *Accurate?*
- *Consistency of analysis provided over time?*

*All the above – may not be realistic!*

# Standardization of Laboratory Analysis

*Reference laboratory procedures need to be peer reviewed and published on an easily accessible platform.*

- *Understanding of what is "reasonable" variation in results.*

# Standardization of Laboratory Analysis

*There needs to be an organization that takes leadership to provide a proficiency testing program that considers a range of nutrient definitions applicable to alfalfa and forage in general.*

*Examples of proficiency programs:*

- *NFTA (National Forage Testing Association)*
- *NAPT (National Association of Proficiency Testing)*
- *AAFCO (Association of American Feed Control Officials)*
- *BIPEA in Europe*

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# NFTA Certification

- *Based on yearly performance on 8 dry, pre-ground samples received by a lab.*
- *Generally, 6 alfalfa hay samples, 1 “mixed” or grass sample, 2 corn silage samples.*
- *Certification based on performance on “dry matter”, protein, ADF, NDF.*
- *NFTA will summarize data for lignin and some minerals, but not part of certification.*

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# NFTA Certification

- *Does not evaluate the sample preparation process.*
- *Does not evaluate two-step dry matter evaluation procedures.*
- *Does not consider nutrients beyond CP, ADF, and NDF that are of value to livestock producers and nutritionists.*
- *Does not speak to the ability of a laboratory to execute ongoing operations in an accurate and repeatable fashion.*

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# Engaging a Defensible Process

- NFTA is not an “accrediting” program.
- The NFTA objectives are not consistent with supporting an accreditation program.

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# Standardization of Laboratory Analysis

*Global opportunity through the use of standardized NIR equations:*

- *Equations held by an independent organization and licensed to subscribing laboratories*
- *The use of key lab NIR equations that can be used in the U.S. and by affiliate labs outside of the U.S.*
- *Does not speak to sample preparation issues or to the need for standardization and monitoring of affiliate lab NIR instruments.*

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# Example of Accreditation Program

CALIFORNIA WATER BOARDS
State Water Resources Control Board

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## Environmental Laboratory Accreditation Program (ELAP)

**MISSION:** To implement a sustainable accreditation program that ensures laboratories generate environmental and public health data of known, consistent, and documented quality to meet stakeholder needs.

**VISION:** Through effective program implementation and continuous improvement of ELAP, California will utilize the highest quality scientific data as a foundation for its environmental and public health programs and decisions.

# Do we engage a defensible forage testing process?

*Characteristics of a defensible process:*

- *A defensible process which has defined protocols.*
- *All information supporting the process is recorded.*
- *There are controls built into the process.*
- *There is a chain of custody in the process.*
- *There is a process to recognize failures and to modify protocol in order to overcome protocol limitations.*

*"People don't fail, procedures fail."*

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# Optimizing Value Transfer

*Value transfer is optimized when parties have confidence in the evaluation of forage quality.*

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