

Study Description

- Three NIRT models. All have passed NTEP
 - Bruins Omega G
 - Infratec 1241 5 copies of each
 - Perten IM9500
- Approximately 450 samples; 3 reps/sample/unit

From GIPSA, GIPSA reference data

– Wheat	250	5 classes	Protein	Run
– Barley	100	2 classes	Protein	Run

From Iowa State, Eurofins reference data

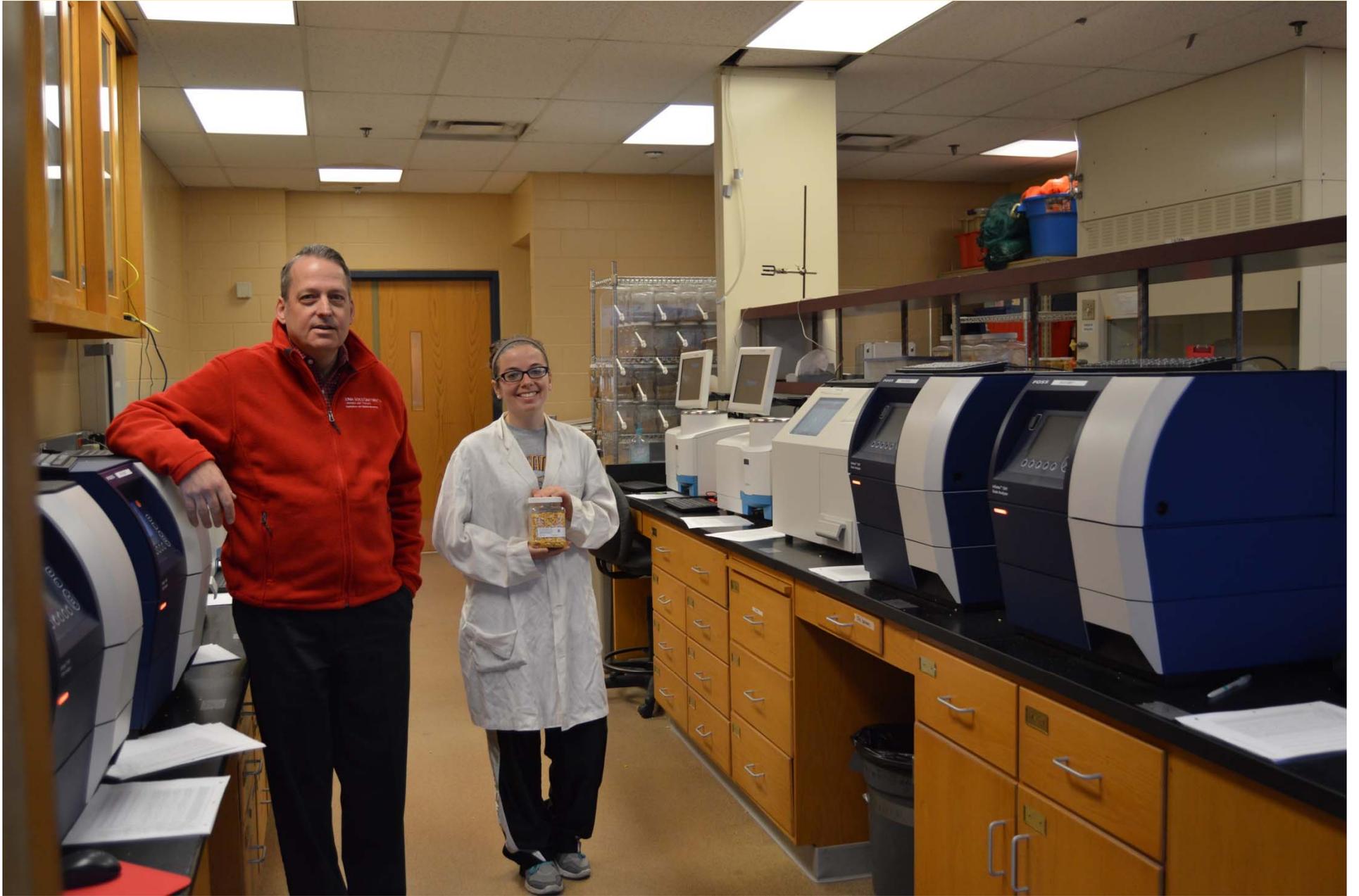
– Soybeans	100+	1 class	Protein, Oil	Running
– Corn	100+	1 class	Protein, Oil	Yet to do

Equivalence Variance Model

- Total variance: Chemistry is out of the loop.
 - Precision (replicates - 3)
 - Reproducibility (copies - 5)
 - Equivalence (models – 3) (Sometimes “harmony”)
 - Random error/sample properties
- Total variance: Total sum of squared differences around the overall average value of all the instruments. Percentages from above sources.
 - **45 * number of samples = degrees of freedom**
- Chemistry is used first to establish accuracy.







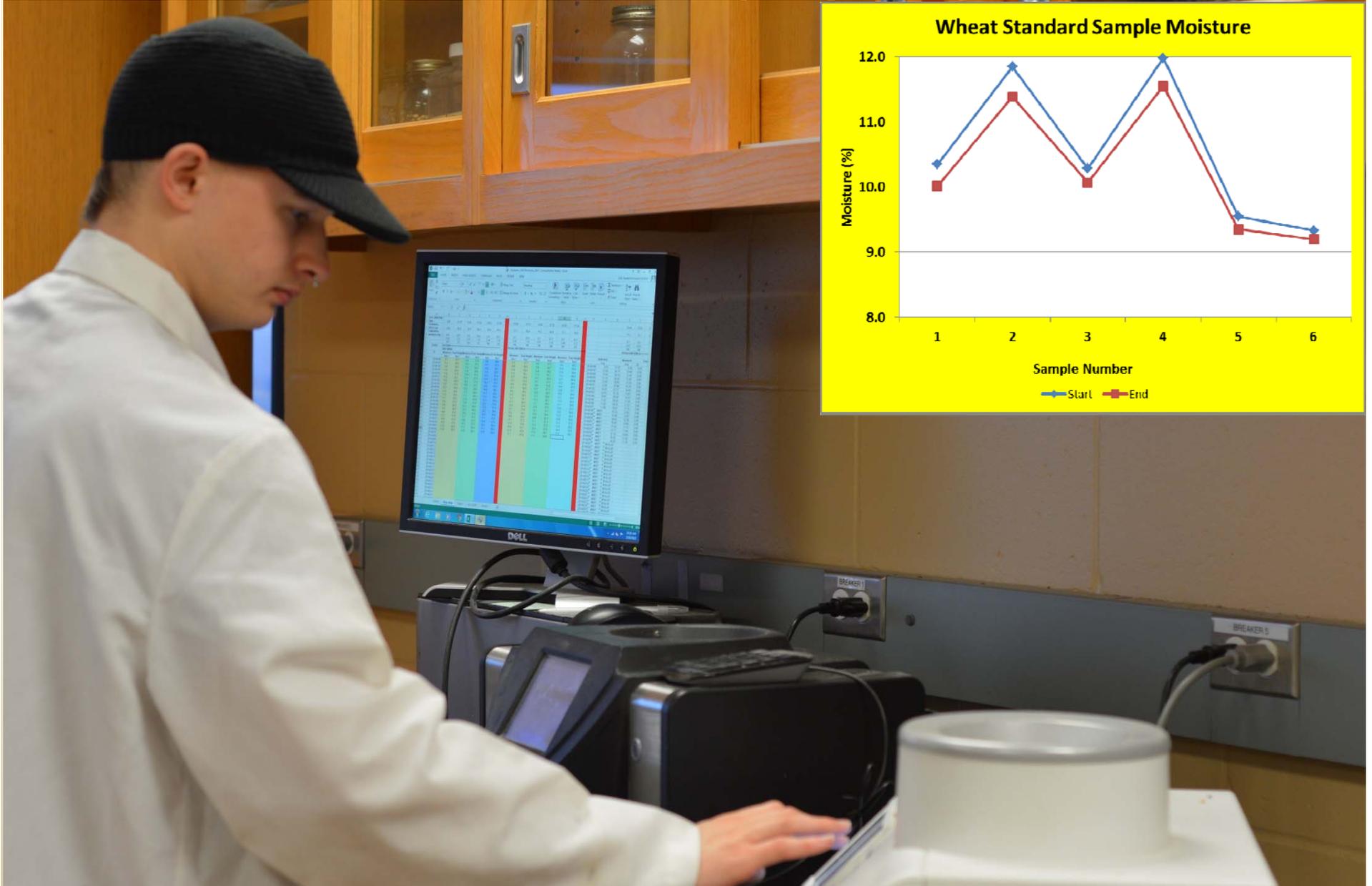


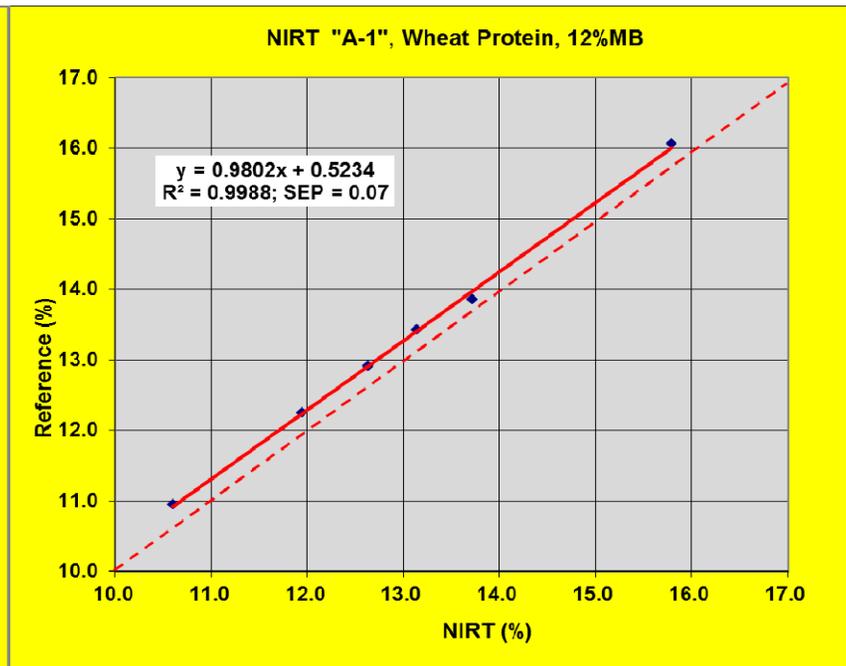
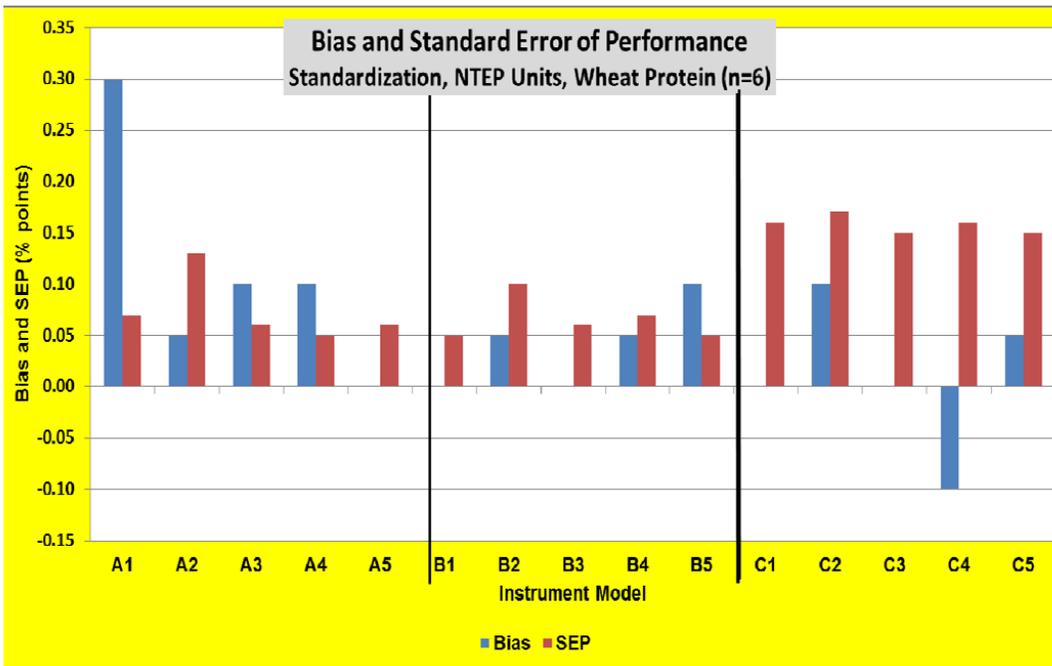


Standardization Summary			Wheat
Ref Data===		6	
	Avg	SD	M Basis
Moisture	10.58	1.14	asis
Protein	13.24	1.72	12%

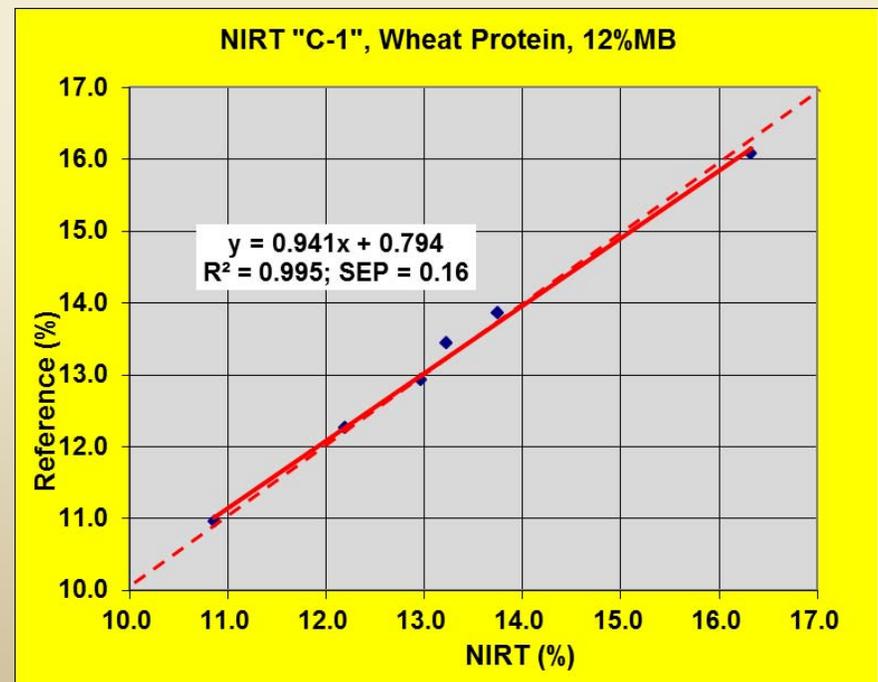
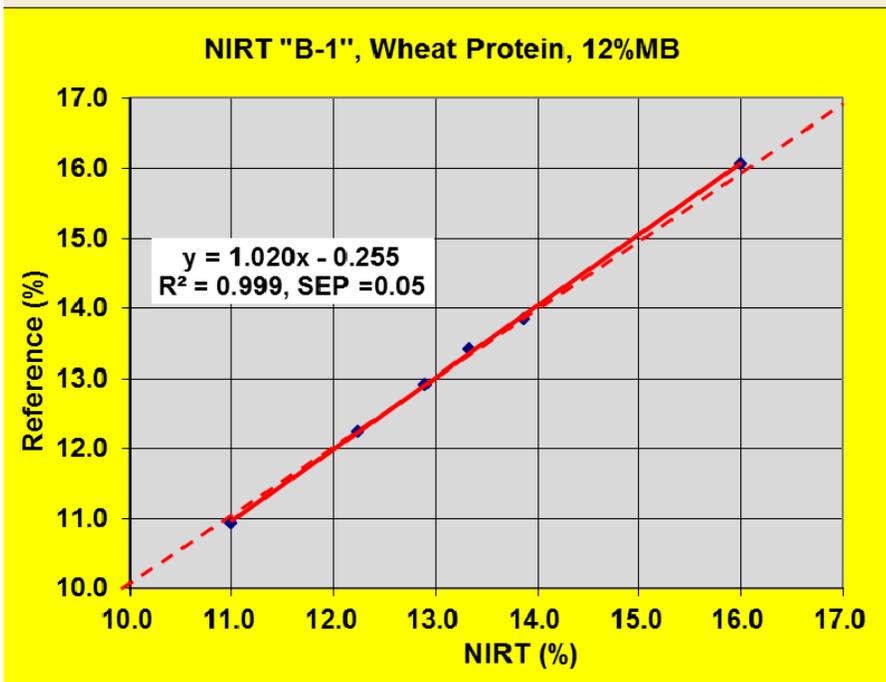
Moisture Reference

2-150 mhz units, 3x/sample

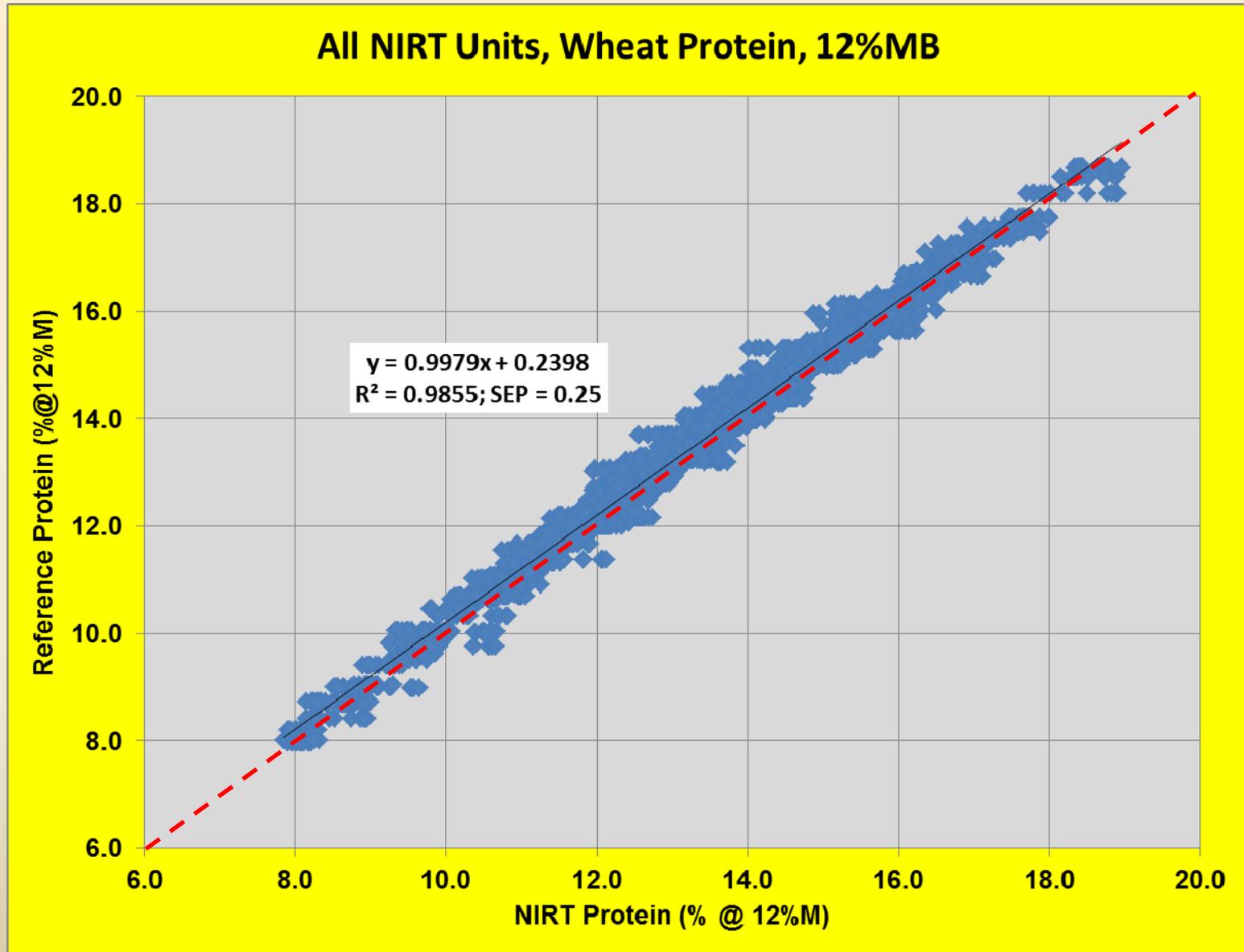




Standard Deviation Across Reps = 0.05% points



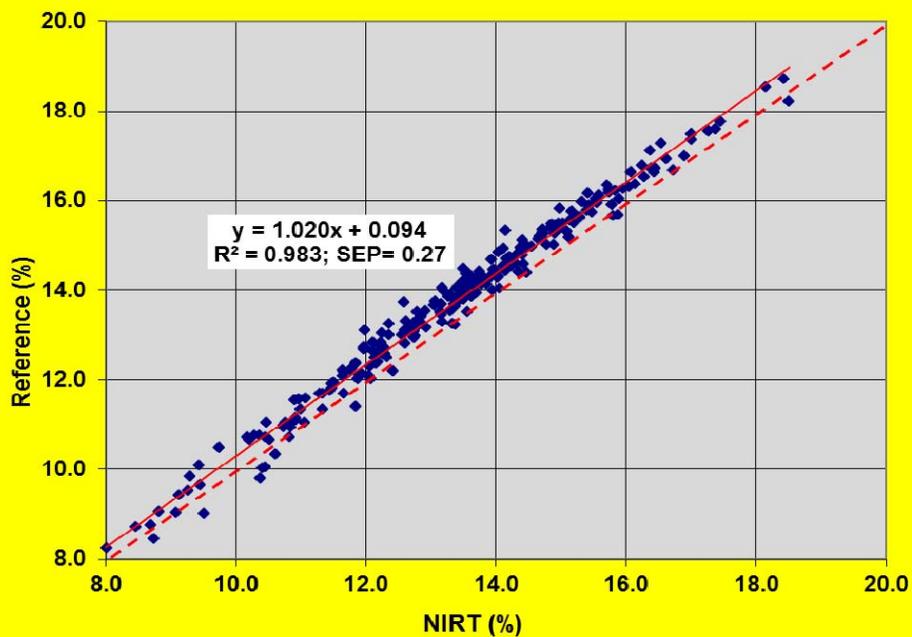
All Data: A, B, C; 5 Units/Brand



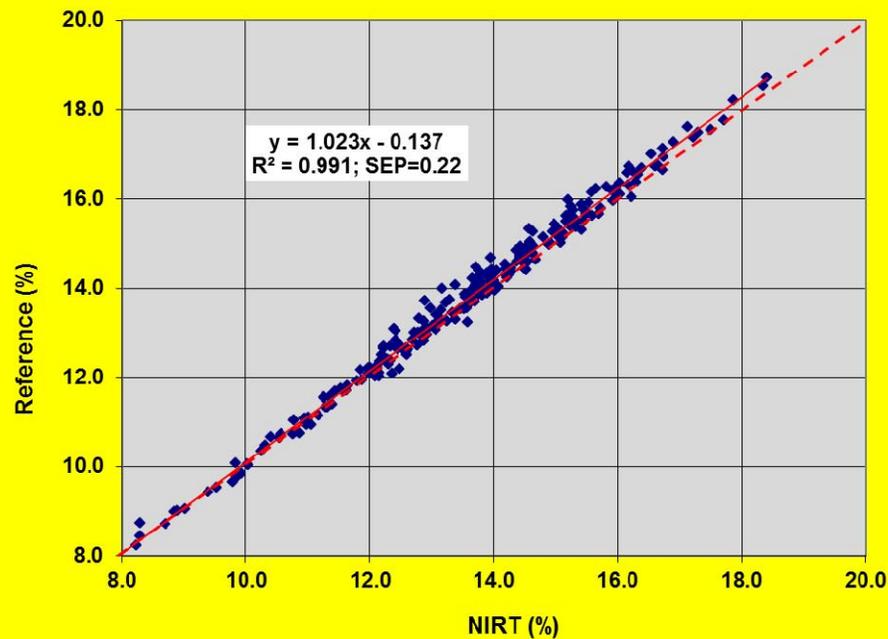
SEP: A = 0.28; B = 0.21; C = 0.26

Standard Deviation Across Reps = 0.05% points

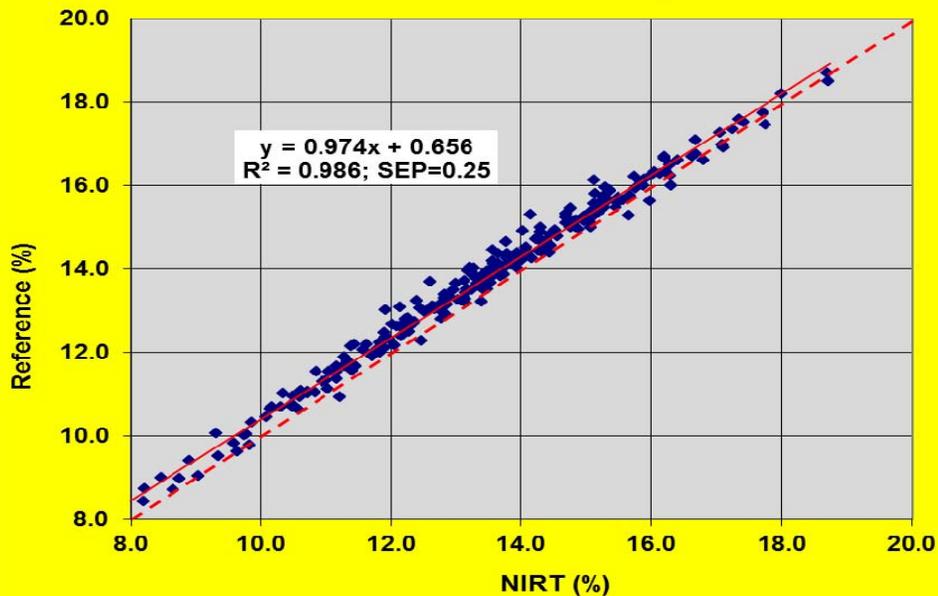
NIRT "A-1", Wheat Protein, All samples, 12%MB



NIRT "B-1", Wheat Protein, All samples, 12%MB



NIRT "C-1", Wheat Protein, All samples, 12%MB



Comparison of Bias Corrections Wheat Protein, 12%MB

<u>Unit</u>	<u>Initial 6 Samples</u>	<u>All 250 Samples</u>
A-1	0.35	0.30
B-1	0.00	0.20
C-1	0.00	0.30

Variation Across Instruments

	Avg SD	SEP	%
All 15 Instruments (Reproducibility + equivalence)	0.15	0.254	59%
A Only (5 instruments)	0.12	0.28	44%
B Only (5 instruments)	0.06	0.21	26%
C Only (5 instruments) (Reproducibility only)	0.10	0.26	38%

Avg SD = Average Std. Dev. across all NIRT on a sample

SEP = Standard Error of Performance vs reference

AACC 39-00 Criterion: Reproducibility < 50% of SEP (to ref)

Wheat Protein, 12% moisture basis

Initial Messages for Equivalence

- All the units are very repeatable. Spectral hardware is good.
- Small standardization sets did not always track the test data.
- Commonality of calibration samples and upgrade of standardization sets are probably more important than hardware design.
- The coarse grains will be more challenging.

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