A handheld spectrometer to analyze forages and feed at the farm

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THE FIRST COMMERCIAL MONCHROMATOR INSTRUMENT THE NEOTEC 6250 (installed CRAW in 1980)

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Scio : un scanner de poche capable d'analyser la composition d'un aliment ou d'un objet

PAR EMMANUEL GHESQUIER LE 14 SEPTEMBRE 2015 | 5

Ce dispositif de poche permet d'analyser la structure moléculaire des objets

La société israélienne Consumer Physics située à Hod Hasharon près de Tel-Aviv, a créé un mini-scanner destiné au grand public baptisé SCIO. Ce dispositif de poche permet d'analyser la structure moléculaire des objets, textiles et aliments qui nous entourent. Les informations obtenues par SCIO sont directement affichées sur le smartphone via l'application dédiée.

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http://tellspec.com/

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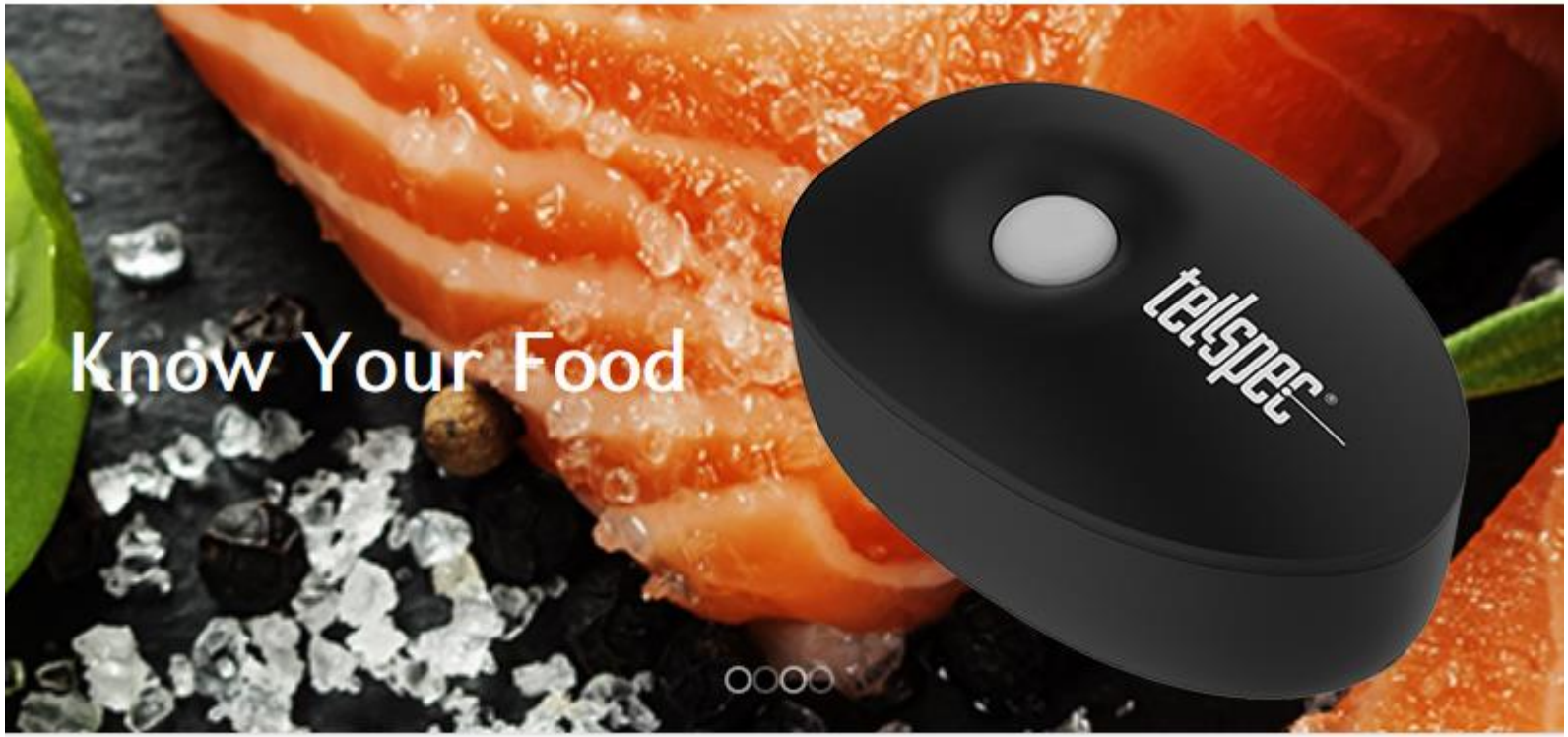
http://tellspec.com/

(900nm to 1700nm)



Fat, proteins, fibre, sugar, glycemic index,

Allergens ? Pesticides?

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Source :http://tellspec.com/

Can TellSpec penetrate into a food?

Yes, TellSpec can penetrate below the surface of a food. Typically TellSpec will be able to penetrate up to a maximum of 15 to 20mm below the surface but how deep depends on how translucent the food is to infrared light.

Which allergens and toxins will TellSpec tell me about?

When Tellspec is released, the information on allergens will include the 6 most common allergens: gluten, milk, peanut, egg, hazelnut, and seafood. TellSpec will then expand its coverage of other food ingredients and chemicals with time, and all customers will benefit.

TREND FOR PORTABLE AND MINIATURIZED

??

REPRESENTIVE SAMPLES or SUB SAMPLES

??

LOD (ppm, trace elements)

Calibration Transfer from Dispersive Instruments to Handheld Spectrometers

J. A. FERNÁDEZ PIERNA, PH. VERMEULEN, B. LECLER, V. BAETEN, and P. DARDENNE*

Walloon Agricultural Research Centre (CRA-W), Valorisation of Agricultural Products Department, Food and Feed Quality Unit (U15), 'Henseval' Building, Chaussée de Namur, 24, 5030 Gembloux, Belgium (J.A.F.-P., Ph.V., B.L., V.B., P.D.)

Volume 64, Number 6, 2010 APPLIED SPECTROSCOPY

→ **30 subscans**

Dimensions (w × h × d): 42 × 42 × 13.5 cm (16.5 × 16.5 × 5.3 inches) + brackets to hold the unit
Weight: 20 kg / 44 lbs

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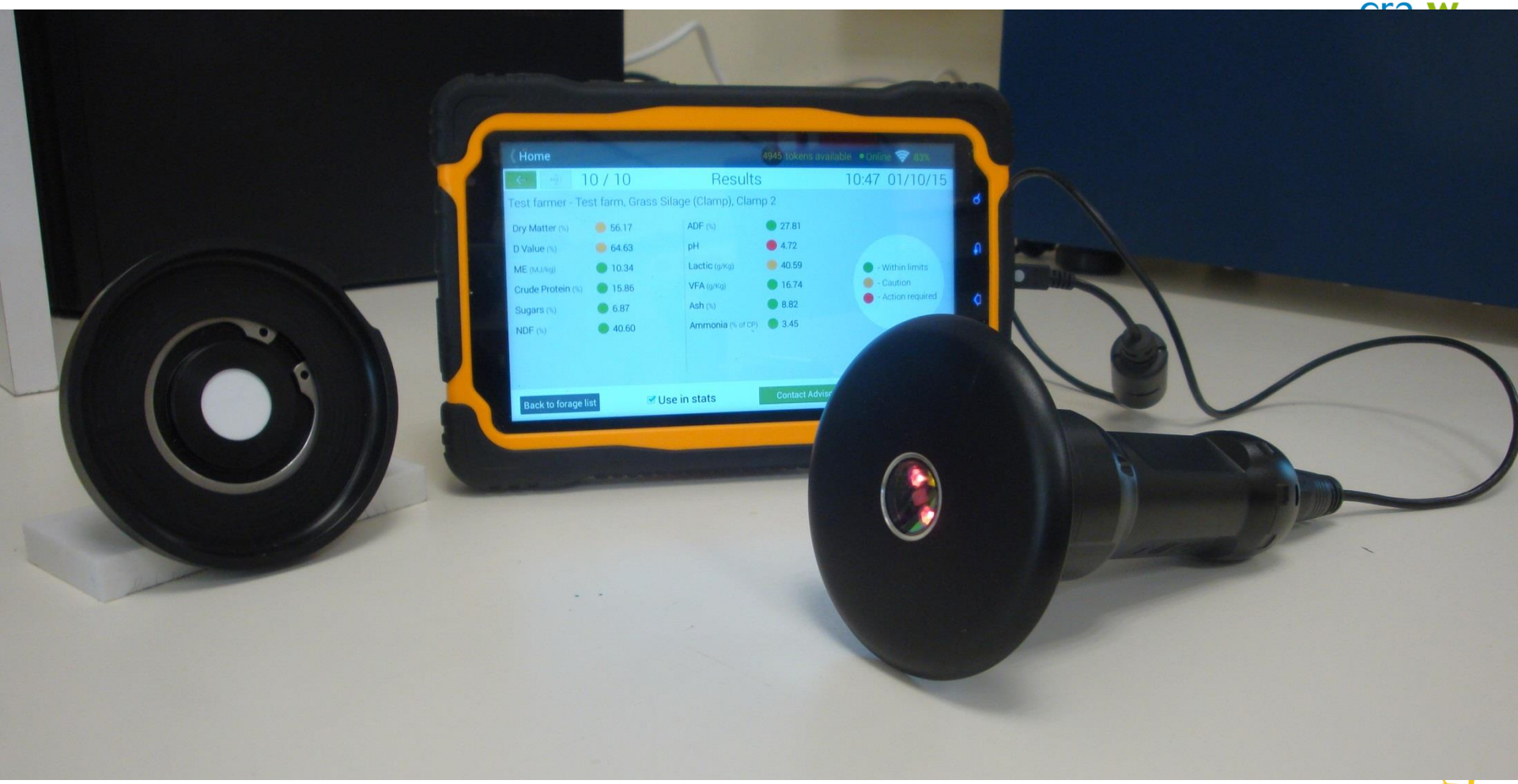
Thermo Phazir (polychromix)

ASD FieldSpec4

GRID → 30 subsamples & scans

http://www.nir4farm.com/

950-1650 nm



VIAVI – JDSU

AUNIR

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- The highest source of error is due to sampling and will be the same for NIR and wet chemistry.

$$STD_{mean} = \frac{STDpop}{\sqrt{n}}$$

N_SCANS
= F (SNR, Sample Heterogeneity)

NOISE << SPL heterogeneity

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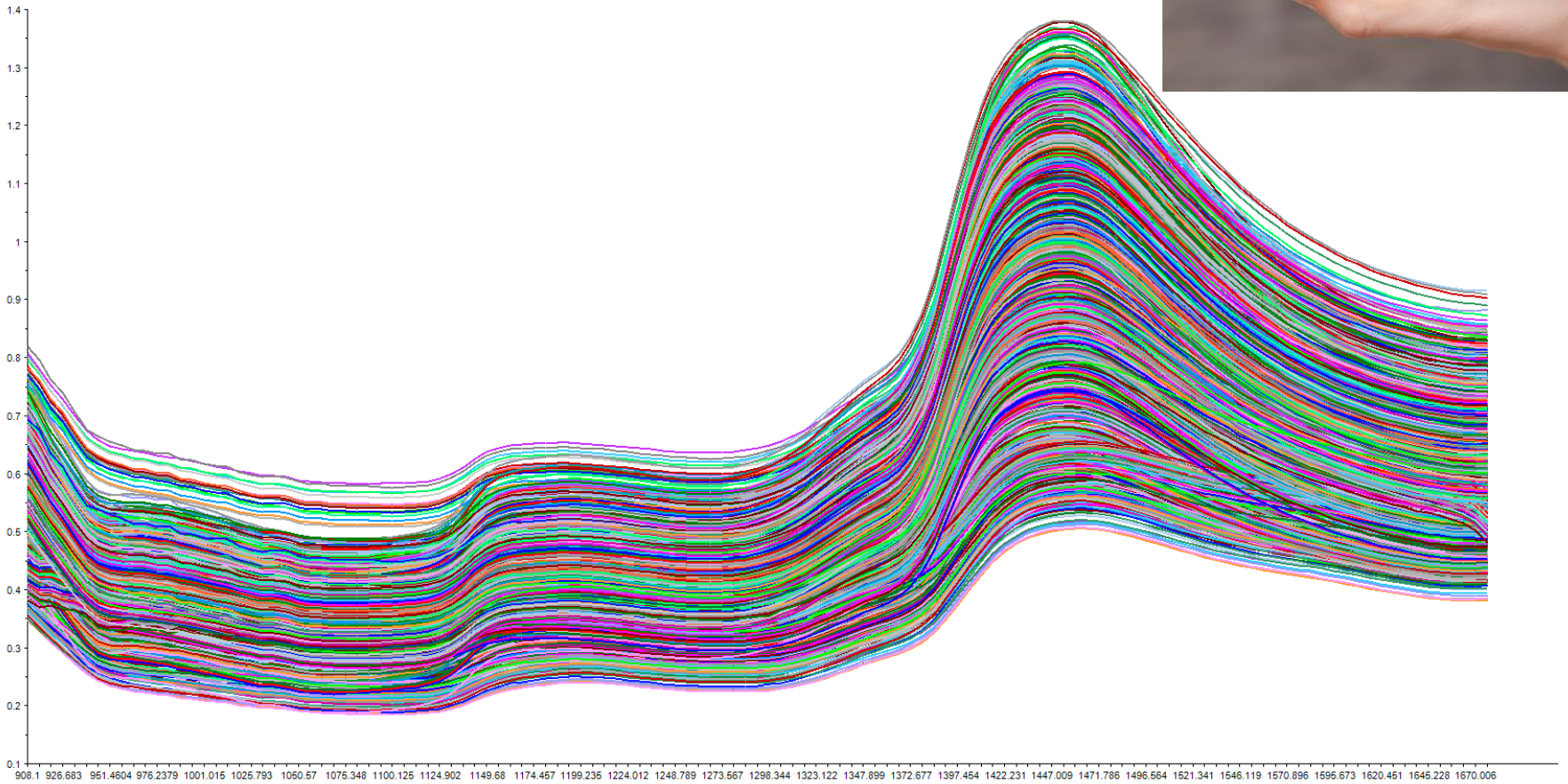
125 silage samples – 20 subscans



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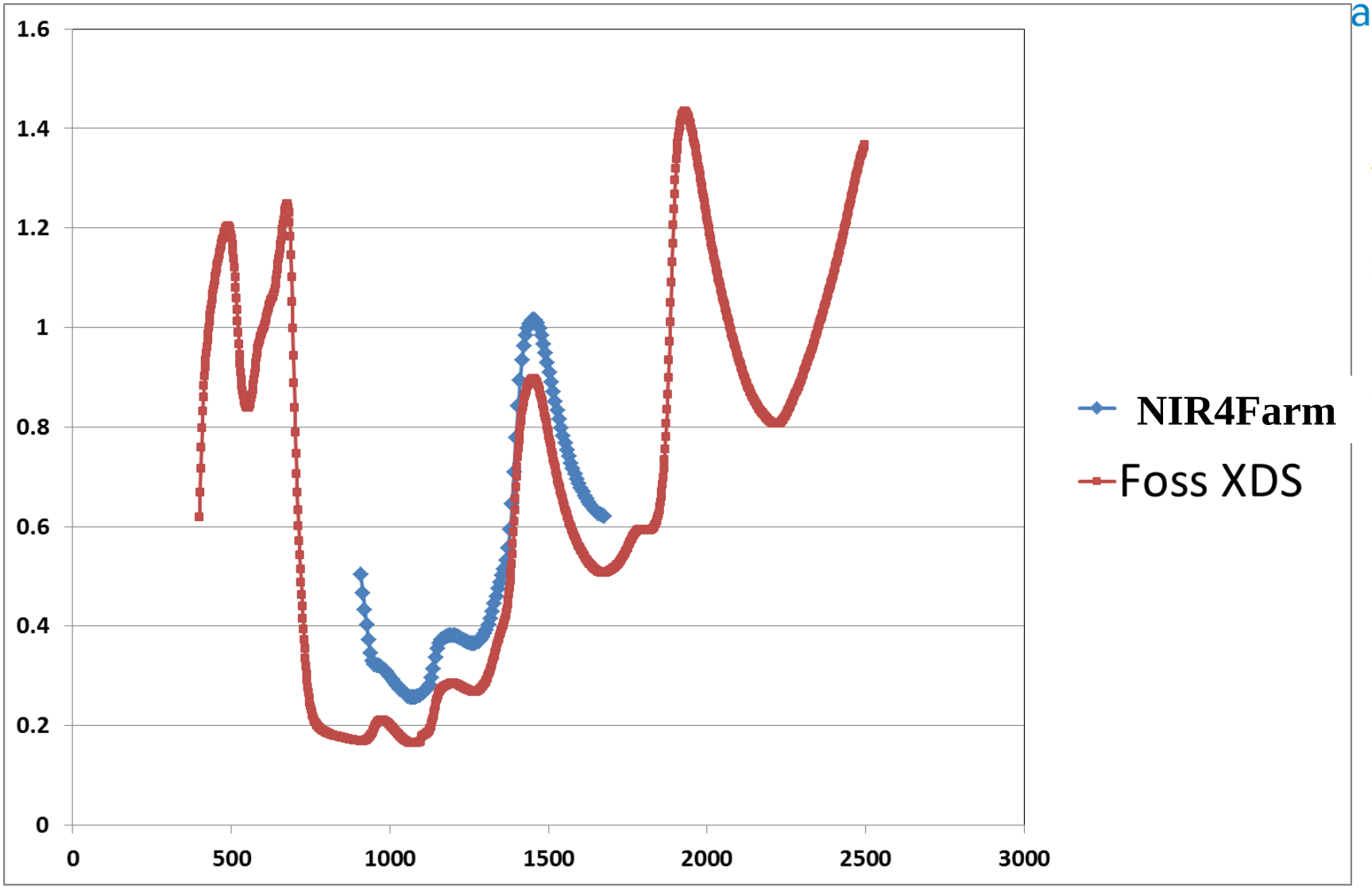

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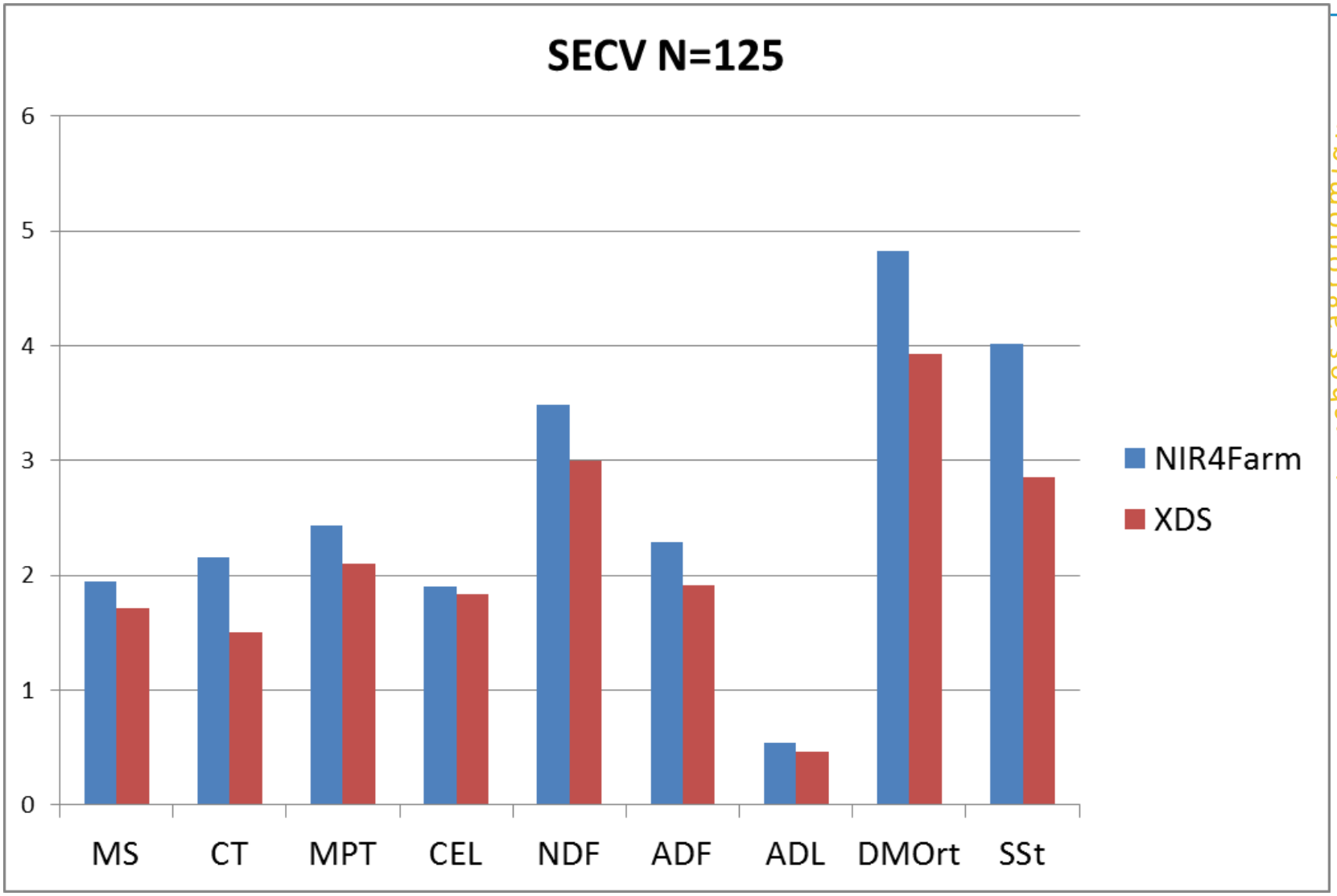

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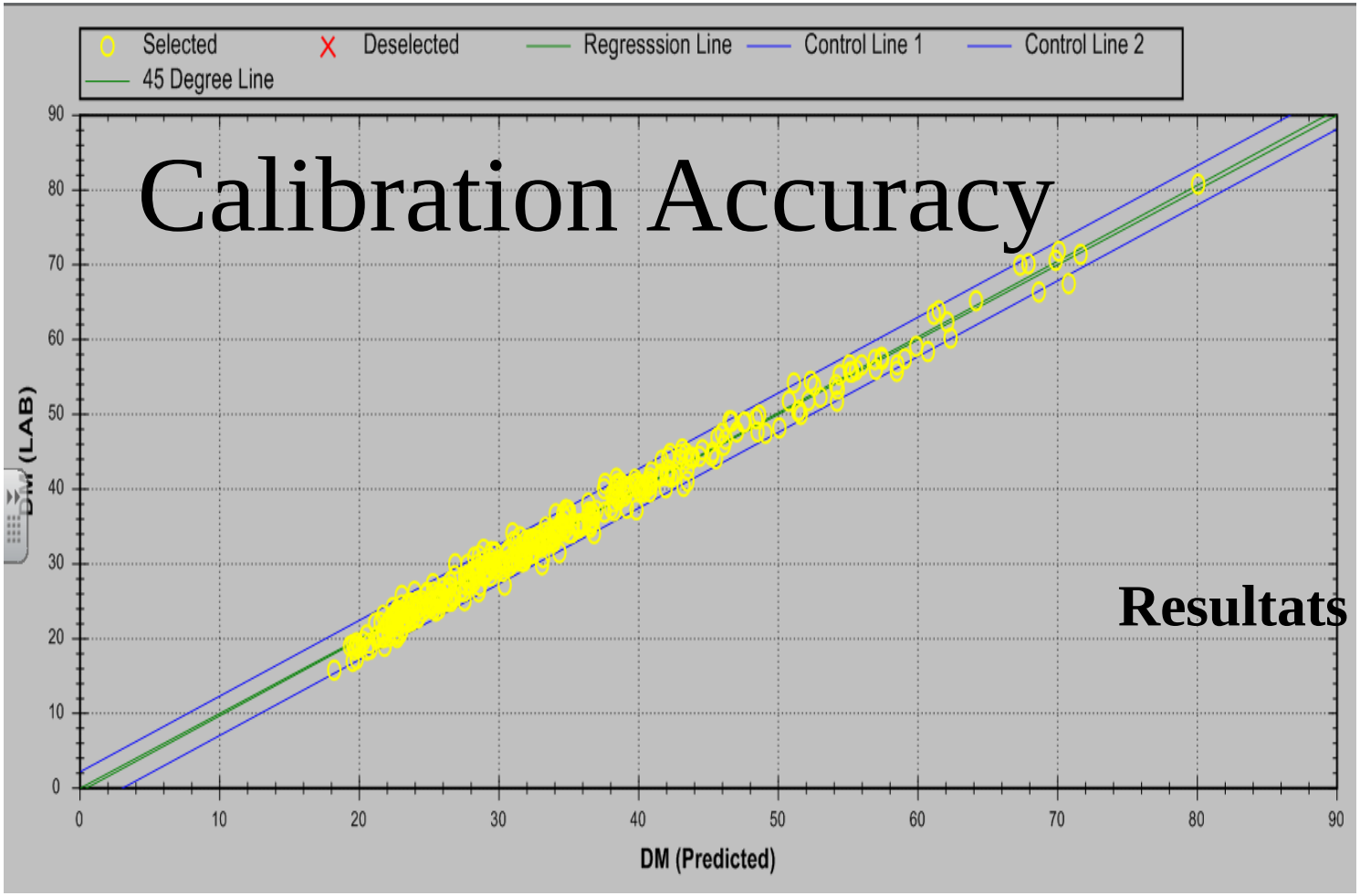

Resultats AUNIR

Dry Matter	N	Mean	SD	SEC	RSQ	RPD
Grass Silage	993	35.70	14.853	1.76	0.986	8.4
Maize Silage	808	36.01	8.072	2.04	0.936	3.9
Fresh Grass	472	22.61	4.957	1.71	0.880	2.9

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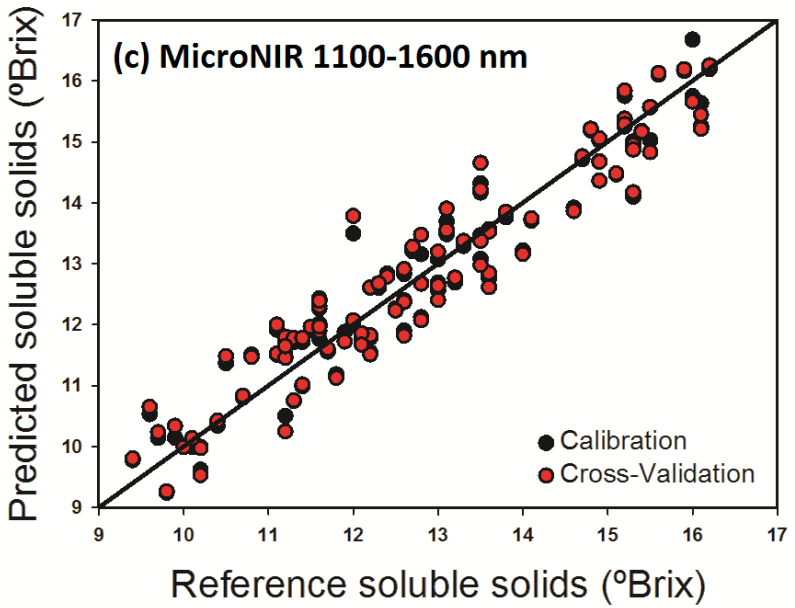
File Name:	C:_data\Pierre1\missions\2015 12 03 heliopsir\HERBE XDS_JDSU\grs_nc		
File Date:	Fri Nov 27 12:51:26 2015		
Last Update:	Thu Dec 03 09:05:09 2015	File ID:	Grass Silage
Master No:	0001	Instrument Model:	<none>
Serial No:	0001	Constituents:	12
Calculated Equations:	0	Number of Variables:	370
Moisture Basis	Dry Matter		
Segment 1	920 - 1658, 2		

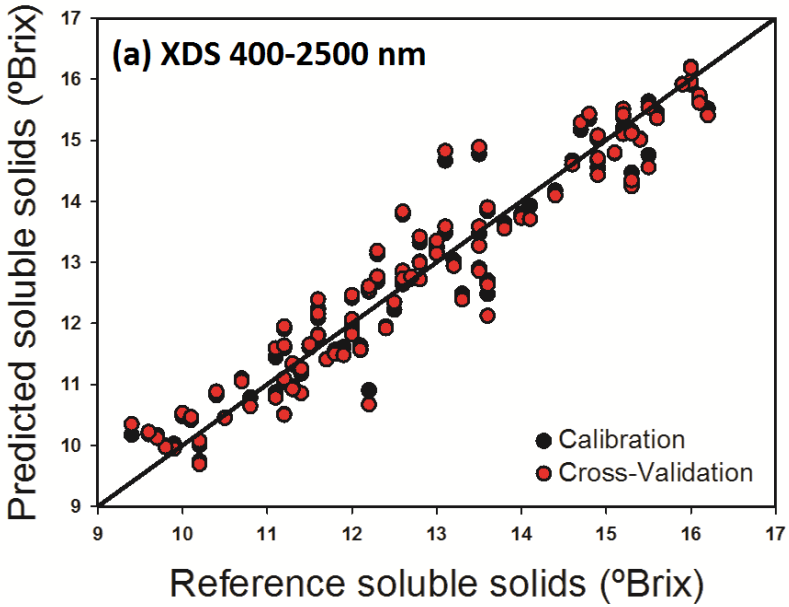
Constituent	N	Mean	SD	SECV	1-VR
DM	1468	32.7441	10.5498	1.6691	0.9750
Protein	1603	13.0964	2.1119	1.1305	0.7132
ADF	1699	30.9603	2.7155	1.2717	0.7806
NDF	1728	48.1155	4.3188	2.1575	0.7503
DVAL	1687	65.0092	4.0501	1.8226	0.7974
WSC	1601	3.5194	1.9070	0.5896	0.9044
Ash	1743	8.0532	0.8266	0.4569	0.6944
NH3	1641	2.9138	1.1123	0.8221	0.4533
pH	1680	4.0575	0.2586	0.1505	0.6609
Lactic	1654	60.9410	24.9716	14.9250	0.6426
VFA	1638	21.1855	9.4116	6.4679	0.5274

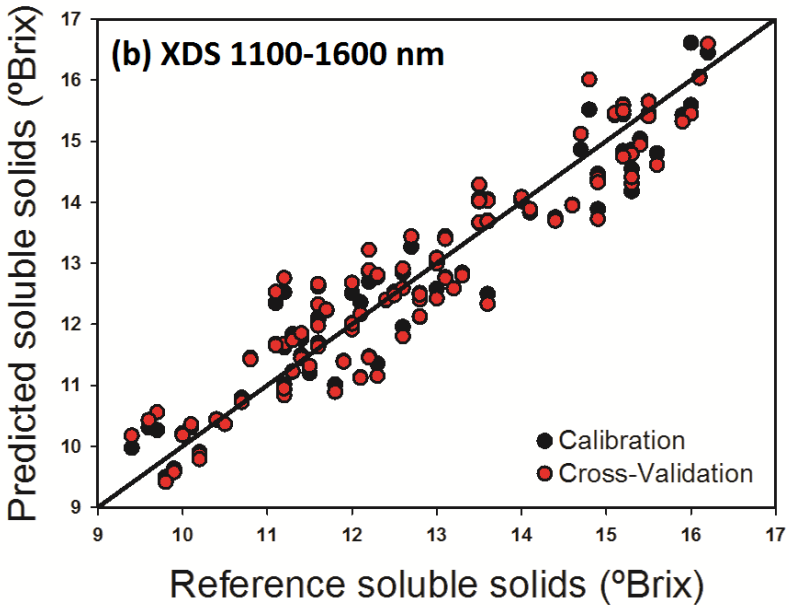
$$SEP^2_{actual} = SEP^2_{observed} - SEL^2_{ref}$$

Value to the dairy farmer

- Predicting grass quality, improved grazing & silage making
- Better informed on the forages being fed
- Ration consistency & predicting intakes
- Reducing wasted feed
- Improved efficiency, higher milk yields
- Nutrient-balancing eg. N







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Other applications at the farm

Milk,

Feed,
Cereals,
Soils,
Composts,
Manures,
..
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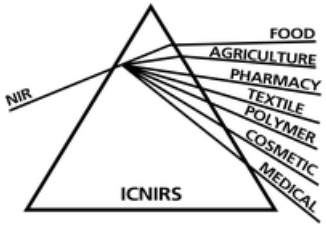

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