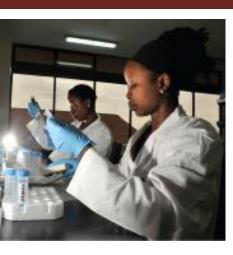
ILRI EQUIP NIRS Activities













Activities

- New NIRS equations Tef straw, Napier grass and barley straw, Aflatoxin predictability
 - Shared with Rapid Phenotyping" laboratory in Australia
- Mapping potential of NIRS hubs in South Asia and East and West Africa
- Exploration of 4 handheld mobile NIRS
- Miscellaneous NIRS purchase for BF initiated, other infrastructure being prepared
- NIRS platforms (EIAR, Holleta, Mekelle University)





Napier NIRS equations based on 150 samples

	Calibration		Validation		Final predictive equation	
	R ²	SEV	R^2	SEC	R ²	SEC
Nitrogen (%)	0.97	0.09	0.93	0.2	0.98	0.09
NDF (%)	0.92	1.1	0.88	1.9	0.96	0.9
ADF (%)	0.98	0.6	0.93	1.2	0.96	0.8
ADL (%)	0.92	0.2	0.85	0.3	0.90	0.2
IVOMD (%)	0.99	0.4	0.95	0.9	0.98	0.5
ME (MJ/kg)	0.99	0.05	0.97	0.09	0.99	0.05

Tef straw NIRS equations based on 104 samples

	Calibration		Validation		Final predictive equation	
	R ²	SEV	R ²	SEC	R ²	SEC
Nitrogen (%)	0.99	0.04	0.95	0.1	0.99	0.07
NDF (%)	0.96	0.8	0.92	1.6	0.98	0.8
ADF (%)	0.94	0.6	0.92	0.9	0.92	0.8
ADL (%)	0.94	0.2	0.79	0.3	0.89	0.2
IVOMD (%)	0.99	0.3	0.97	0.6	0.99	0.3
ME (MJ/kg)	0.99	0.04	0.96	0.07	0.99	0.03

Barley straw NIRS equations based on 100 samples

	Calibration		Validation		Final predictive equation	
	R ²	SEV	R ²	SEC	R ²	SEC
Nitrogen (%)	0.96	0.05	0.93	0.07	0.97	0.04
NDF (%)						
ADF (%)						
ADL (%)						
IVOMD (%)	0.95	0.3	0.94	0.3	0.94	0.3
ME (MJ/kg)	0.96	0.02	0.93	0.03	0.97	0.02

Trait variations in 550 feeds, feed ingredients, forages and roughages used for exploration of mobile NIRS

	Mean	Minimum	Maximum
Nitrogen (%)	2.6	0.3	8.1
NDF (%)	51.2	8.3	82.8
ADF (%)	28.6	2.8	60.5
ADL (%)	5.2	1.1	11.8
IVOMD (%)	8.5	5/1	11.3
ME (MJ/kg)	60.0	38.2	81.1
Aflatoxins (PPB)	881	0	20 464

Phenotyping for feed and fodder quality by Near Infrared Spectroscopy (NIRS)

Physico-chemical c. 60 000 US \$ Calibration Validation





Non-evasive c. 200 samples/d >30 traits





NIRS equations sharable across compatible instruments





Available FOSS-based NIRS Hub Infrastructure

India: ILRI, ICRISAT, private sector

Nigeria:

ILRI, ICRISAT, IITA,

NARES

private sector

Mali:

ICRISAT, NARES

Burkina Faso:

Coming, ILRI-

INERA



Ethiopia:

ILRI, EIAR, MU??

private sector

Uganda:

NARES

Tanzania:

NARES





From stationary to mobile handheld NIRS?









GATES foundation









Available and proposed phenotyping infrastructure

- FOSS type NIRS ready for networking in South Asia, East Africa and West Africa
- NIRS equations for all key cereal and legume crops and feeds and feed ingredients available for sharing
- ILRI platform for NIRS equations being migrated from WiKi to pCloud
- Suitability of diverse mobile NIRS being explored using 550 feed samples scanned on 4 mobile NIRS





Thank you very much for your attention!

and

better lives through livestock

ilri.org

ILRI thanks all donors and organizations who globally supported its work through their contributions to the **CGIAR system**

Patron: Professor Peter C Doherty AC, FAA, FRS

Animal scientist, Nobel Prize Laureate for Physiology or Medicine—1996

Box 30709, Nairobi 00100 Kenya Phone +254 20 422 3000

Fax +254 20 422 3001 Email ilri-kenya@cgiar.org ilri.org better lives through livestock

Box 5689, Addis Ababa, Ethiopia Phone +251 11 617 2000 Fax +251 11 667 6923

ILRI is a CGIAR research centre

Email ilri-ethiopia@cgiar.org

ILRI has offices in East Africa • South Asia • Southeast and East Asia • Southern Africa • West Africa

