



FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative



Photo credit: V. Bado

Feed the Future Innovation Lab For Livestock Systems: Phase I accomplishments

Saskia Hendrickx and Gbola Adesogan

Virtual General Meeting, September 28, 2020



USAID
FROM THE AMERICAN PEOPLE

BILL & MELINDA
GATES foundation

ILRI
INTERNATIONAL
LIVESTOCK RESEARCH
INSTITUTE



UF IFAS
UNIVERSITY of FLORIDA



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The U.S. Government's Global Hunger & Food Security Initiative

VISION

To sustainably intensify livestock production to improve the nutrition, health, incomes and livelihoods of the poor



Photo credit: J.Vipham



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CATALYZING COLLABORATION



- 45 subaward projects
- 20 US universities and organizations
- 43 foreign universities, government agencies and NGOs

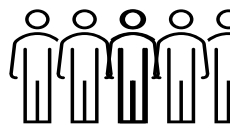


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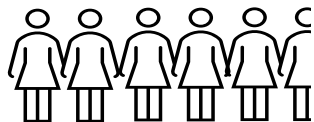
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BUILDING LOCAL CAPACITY

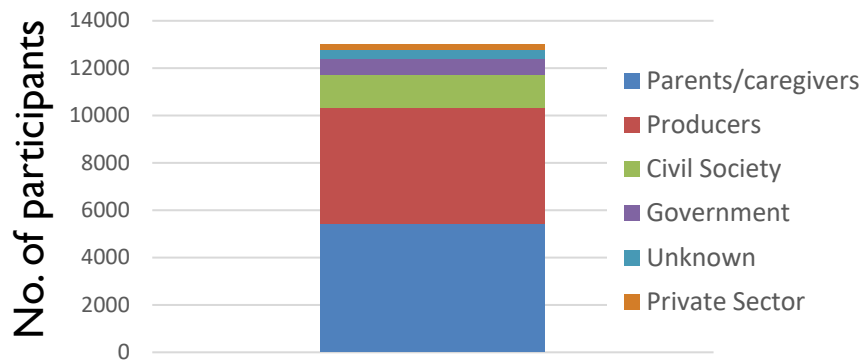
12,924 participated in our programs



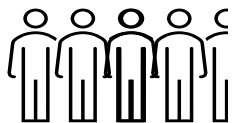
44%



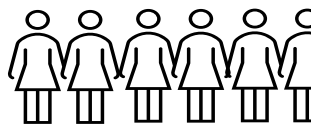
56%



3,969 trained



47%



53%



Photo credit: B. Shrestha



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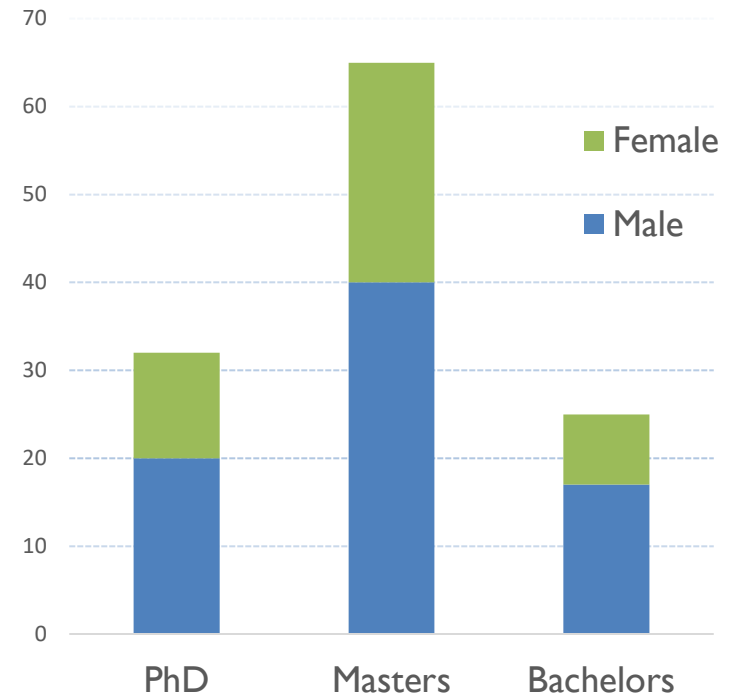
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Dr. Jean Baptiste Ndahetuye, University of Rwanda, received the 2019 Student Researcher Award for Scientific Excellence from BIFAD.

INVESTING IN THE FUTURE

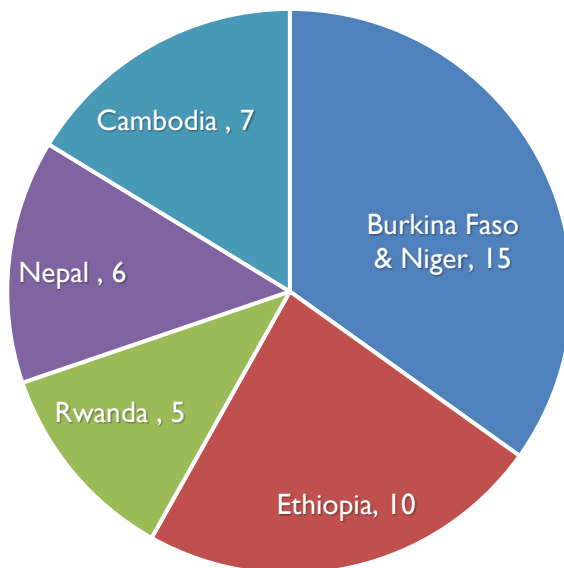
Supported **117** degree-seeking students
(63% Male; 37% Female)



INNOVATIONS DEVELOPED

43 novel practices, approaches and technologies developed

2,935 people are using our innovations



Ration Summary

किसानको नाम	प्राविधिकको नाम	मिति	समय	फाउन्ड नंबर
Farmer Shrestha	Technician Shrestha	2018-3-27	12:11 PM	A1234

क्रस	आहारा	सुख्खा पदार्थ (किलोग्राम)	फेडको रूपमा (किलोग्राम)	न्यूनतम	अधिकतम
1	मकै	3.93	4.52	-	-
2	धान को डुदो	0.96	1.07	-	-
3	मैदेर	4.86	21.12	-	-
4	बल्लिम	0.74	4.35	-	-
5	धानको परात	0.01	0.01	-	-

क्रस	आवश्यकता	न्यूनतम आवश्यकता	अधिकतम आवश्यकता	रामन मिक्स
1	शाली	98.32	108.15	98.32
2	पाच्य प्रोटीन	0.73	0.8	0.8
3	काल्सियम	42.01	46.21	42.01
4	फोस्फोरस	32.32	35.55	32.32
5	अम्लक दाना	0.0	50.0	46.6
6	सुख्खा पदार्थ	9.45	10.5	10.5

प्रति दिन कुल आहारा लागत (रु)	प्रति केजी आहारा लागत (रु/केजी)	दुध आय - आहारा लागत (रु)
216.12	6.96	233.88



SOME OF OUR INNOVATIVE TECHNOLOGIES

- Diarrhea pathogen detection kit
- Aflatoxin detection kits
- Mastitis reduction package
- Improved forage hybrids
- Ration formulation app
- Disease reporting app
- NIRS feed analysis technique
- Methane emissions analysis equipment
- Market empowerment app
- Distance learning app
- Disease surveillance package
- Behavior messaging package



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16

T2=Adlib Teff Straw + molasses 20% + wheat bran 40% + Cotton seed cake 40%
T3= Adlib Teff Straw + wheat bran 65% + dried brewers' gains 35%

Data collected
Daily offered and refused, feed conversion ratio and feed conversion efficiency of each treatment diet was measured weight of the cattle divided by the number of feeding days.

Analysis
Diets were analyzed for contents of DM, ash, nitrogen, neutral detergent fiber, acid detergent fibre and others.
During feeding trial, three experimental animals from each treatment was randomly selected, fasted overnight and then slaughtered. Dressing percentage was calculated using empty body weight and expressed as the percentage of slaughter weight. Carcass weight loss was calculated from cold carcass weight in relation to fresh weight.

Statistical analysis
Data was conducted using standard partial budget analysis guideline of CIMMIT (1988).
Data was subjected to analysis of variance using the General Linear Model Procedure of SAS (SAS, 1998). Significant differences were determined using Duncan's multiple range test.

Chemical composition treatments diets

Parameters	T1	T2	T3
DM (%)	92.78	92.19	10.25
Crude protein (%)	92.22	89.75	18.95
Crude fiber (%)	33.25	36.45	36.89
Cellulose (%)	17.14	16.04	15.69
Starch (%)	5.36	3.47	5.96
kg DM/kg	66.75	63.55	63.11
g/kg DM	16.11	20.41	21.2
DM ²	11.78	12.57	9.73
Water-soluble carbohydrate/g/kg	32.83	31.99	33.91

3.2. Total Dry matter and Nutrient intake

Parameters	T1	T2	T3
Teff Straw intake (kg/day)	1.78	1.78	1.78
Supplementation intake (kg/day)	1.78	1.78	1.78
Total dry matter intake (kg/day)	1.78	1.78	1.78
Total DM (kg/kg W0.75)	1.78	1.78	1.78
Total DM (%BW)	1.78	1.78	1.78
Total Nutrient intake(TNI)	1.78	1.78	1.78
Total OMI (kg/d)	1.78	1.78	1.78
Total CPI (kg/d)	1.78	1.78	1.78
Total NDFI (kg/d)	1.78	1.78	1.78
Total ADFI (kg/d)	1.78	1.78	1.78
Total ADLI (kg/d)	1.78	1.78	1.78
Total SM (g/kg DM)	1.78	1.78	1.78
Total SCH(g/kg DM)	1.78	1.78	1.78

3.3. Carcass yield of Raya cattle bull

Treatments	T1	T2	T3	SE	P value
(kg)	165.4	166	166	0.75	0.81
(g)	236.4	239.4	228.6	3.55	0.14
Hot carcass weight (kg)	788.8	815.5	695.5	42.6	0.15
(kg DM/kg)	8.5	8.9	9.7	0.41	0.15
Efficiency (kg)	11.8	11.3	10.3	0.50	0.175

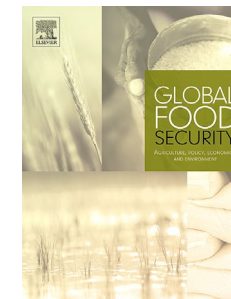
3.4. Carcass yield of Raya cattle bull

Parameters	T1	T2	T3	SE	P value
Slaughter weight (kg)	274.4	299.8	285.8	9.4	0.19
Hot carcass weight (kg)	334.3	338.8	319.8	7.8	0.2
Carcass Percentage (%)	823	899	857	28.2	0.19
Edible meat weight (kg)	1638b	1829.5a	1167c	30	0.0001
Edible viscera weight (kg)	2461b	2729a	2024c	46	0.001
Total edible percentage (%)	6220	6380	6183	170	0.6
Edible Visceral (kg)	9140	9260	9283	636	0.9
Non-edible Percentage (%)	2920	2880	3100	512	0.9
Bone weight (kg)	458	150	1075	495	0.39
Lean Meat weight (kg)					
Meat to bone ratio					

Fig 4. Hot Carcass

THOUGHT LEADERSHIP

- > **250** publications/communication products
 - **3** journal “special issues” on our work
 - **30** journal papers published in 2020
 - **40+** keynote presentations at professional meetings
 - **66** subawardee presentations
- > **120** knowledge sharing events



The graph illustrates the percentage of total food intake by food type over time. The Y-axis represents the percentage (0.6 to 2.0). The X-axis shows time in months from Jan-07 to Aug-16. The legend includes: Dairy (solid dark green), Eggs (dashed dark green), Meats (solid light green), Oils/fats (dashed light green), Sugar/honey (solid very light green), and Grains/roots/tubers (dotted blue).

Month	Dairy	Eggs	Meats	Oils/fats	Sugar/honey	Grains/roots/tubers
Jan-07	1.00	1.00	1.00	1.00	1.00	0.80
Jun-07	1.00	1.00	1.00	1.00	1.00	0.90
Nov-07	1.00	1.00	1.00	1.00	1.00	1.00
Apr-08	1.10	1.10	1.00	1.00	1.00	1.10
Sep-08	1.15	1.15	1.00	1.00	1.00	1.20
Feb-09	1.15	1.15	1.00	1.00	1.00	1.20
Jul-09	1.10	1.10	1.00	1.00	1.00	1.10
Dec-09	1.10	1.10	1.00	1.00	1.00	0.80
May-10	1.05	1.05	1.00	1.00	1.00	0.70
Oct-10	1.05	1.05	1.00	1.00	1.00	0.65
Mar-11	1.10	1.10	1.00	1.00	1.00	0.60
Aug-11	1.15	1.15	1.00	1.00	1.00	0.65
Jan-12	1.20	1.20	1.00	1.00	1.00	0.85
Jun-12	1.25	1.25	1.00	1.00	1.00	0.85
Nov-12	1.25	1.25	1.00	1.00	1.00	0.85
Apr-13	1.25	1.25	1.00	1.00	1.00	0.85
Sep-13	1.25	1.25	1.00	1.00	1.00	0.85
Feb-14	1.25	1.25	1.00	1.00	1.00	0.80
Jul-14	1.25	1.25	1.00	1.00	1.00	0.75
Dec-14	1.25	1.25	1.00	1.00	1.00	0.75
May-15	1.25	1.25	1.00	1.00	1.00	0.75
Oct-15	1.25	1.25	1.00	1.00	1.00	0.75
Mar-16	1.25	1.25	1.00	1.00	1.00	0.75
Aug-16	1.25	1.25	1.00	1.00	1.00	0.75



IMPACTING POLICY

Rwanda

- Detected high aflatoxin levels in purchased feeds
- Conducted national workshop to prevent /mitigate aflatoxin in food and feed
- Partners:
 - Ministry of Agriculture and Animal Resources
 - USAID/Rwanda Hinga Weze Activity
- Govt. **aflatoxin task force** now implementing recommendations.



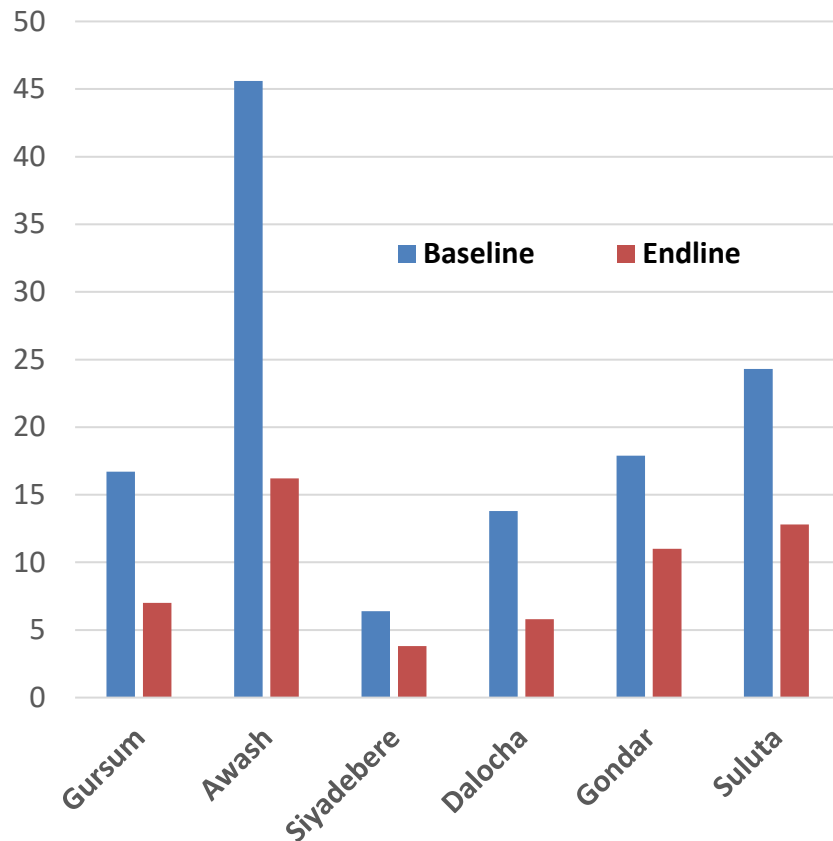


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INCREASING RESILIENCE

Ethiopia



Reducing calf mortality



New drought-resistant sorghum genotypes for year-round feeding



IMPROVING HEALTH

Cambodia

Determined that each case of foodborne disease costs \$62.

Main diagnoses:

- Acute diarrhea (74.4%),
- Food poisoning (24.4%),
- Typhoid (0.8%)
- Chronic diarrhea (0.4%)

Now piloting food safety interventions.



Photo credit: H. Nguyen



IMPROVING HEALTH AND NUTRITION

Burkina Faso

We increased infant egg consumption from 0 to 6 eggs weekly.

- This significantly reduced wasting.
- Results made the national news
- Discussed how to scale the approach with policy makers





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WOMEN'S EMPOWERMENT



Photo credit: B. Shrestha

Nepal

Compared to classroom training, our distance learning course helped **24%** more women become community animal health workers



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INCREASING INCOMES



Niger

We expanded market access for feed traders by linking them with livestock keepers 800 km away.

Feed costs were reduced by **30%**

12.6 tons of feed sold in 4 months (**\$3,600**)

Ramana Doni earned **33%** more money from sales of her (well-fed) sheep.

Photo credit: V. Bado



SUMMARY

- We are making a difference:

We have improved livestock productivity, reduced disease prevalence, empowered women, improved food safety, increased incomes, and improved nutrition.

- Special thanks to each of you for your many contributions.
- COVID-19 has made the need for our work much greater.
- We look forward to building on and expanding our work with you in Phase II.



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