Report from training of master trainers on feeds and feeding in Rwanda, Kigali, 28-29 April 2021

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Preamble

One crucial finding of the G-FEAST studies carried out in RDDP project areas showed that dairy producers in Rwanda did not have access to information needed to improve dairy nutrition and that they did not understand dairy production. To address this information gap, ILRI has adapted existing training materials with simplified technical information on various aspects of dairy production. This Training of Trainers (ToT) seeks to ensure that this technical information is delivered by extension service providers accurately and in a consistent manner.

Objectives

The main goal of the workshop is to prepare extensionists to present information effectively, respond to farmers information needs, and carry out activities that reinforce learning.

By the end of the workshop, participants will be able to:

- Explain the dairy value chain and the players at each level, the benefits of dairy farming and the process that should be followed when starting a dairy farm.
- Identify the different types of feed resources that can be used to feed dairy cattle, group them according to the major nutrient they supply and explain how the animal utilizes them.
- Learn basics of calculating the feed requirements of different classes of dairy cattle and how to determine the quantities of available feed that can meet those requirements.
- Explain forage seed production, harvesting and storage

Training/learning methodology:

- Plenary presentations and discussions
- Small group practical work and discussions
- Teach back

Day 1: Wednesday, 28 April 2021

Welcome and opening remarks

Abdul Madjid Sindayigaya from the RDDP noted this is the 4th year in the project implementation. He emphasized that RDDP has been using the livestock-focused Farmer Field Schools (L-FFS) approach aimed at building farmers' capacity to analyse their livestock enterprises, identify problems, test possible solutions, and try some of the practices on the own farms.

RDDP invited field technicians to attend this training session because they work directly with L-FFS groups on daily basis as Master Trainers and mentor farmers in their respective areas. The 2 days training session is therefore important to acquire the knowledge and skills needed to support the implementation of interventions and hoped that ILRI will continue to support the master trainers. He observed that, RDDP has a bigger team of master trainers from (HIR, RAB, RCVD) but due to covid-19 restrictions, all of them were not invited. He ended by wishing to all participants a fruitful and participatory workshop where they can exchange on experiences on feeds and feeding strategies for increased milk productivity.

Introductions

The workshop attendees introduced themselves as follows:

Names	Professional Background	Work location	Role RDDP project	A major learning as a master trainer
Blaise Iraguha	Veterinarian	Heifer International Rwanda (HIR), Nyabihu district	L-FFS Master Trainer, District field technician HIR/RDDP Project	Better understanding of L-FFS methodology
Bernadette Mukashyaka	Veterinarian	HIR / Nyagatare District	L-FFS Master Trainer	Better understanding of L-FFS methodology
Gaëtan RUTABAYIJA	Veterinarian	HIR / Musanze District	L-FFS Master Trainer	L-FFS is a group approach to grow interactions with farmers
Daniel KURAWIGE	Veterinarian Speciality in Animal Source Food	HIR / Burera District	L-FFS Master Trainer, District field technician HIR/RDDP Project	Use of Heifer Holistic approach and L-FFS methodology to move closer to farmers 'groups
Remy Titien NIYIREBA	Animal Scientist	Rwanda Agricultural Board (RAB), Rubona Station	Mentor L-FFS Master trainers	Use of L-FFS methodology to identify, analyse, plan possible solutions with farmers
Jean de Dieu KUBWIMANA	Veterinarian	HIR / Rubavu District	L-FFS Master Trainer, District field technician HIR/RDDP Project	L-FFS methodology enables farmers to use their own capacity sustainably
Moses ASIMWE	Veterinarian	HIR / Ruhango District	L-FFS Master Trainer, District field technician HIR/RDDP Project	Conducting trainings in the field with farmers through L-FFS
Augustin HAVUGIMANA	Veterinarian	HIR / Rwamagana District	L-FFS Master Trainer, District field technician HIR/RDDP Project HIR/RDDP Project implementation	Gained a better understanding of L-FFS approach where farmers have an opportunity to develop themselves from their own resources through the L-FFS
Pierre Celestin MUKESHIMANA	Veterinarian	HIR / Kayonza District	L-FFS Master Trainer, District field technician HIR/RDDP Project	Learned that farmers are conscious and able to come up with different solutions to manage their livestock with little supervision
Georges KHAGARAMA	Veterinarian	HIR / Nyanza District	L-FFS Master Trainer, District field technician HIR/RDDP Project	Have learned to conduct trainings on different livestock topics through informal interactions with farmers.
Mathias HAJABAKIGA	Veterinarian	HIR / Huye District	L-FFS Master Trainer, District field technician HIR/RDDP Project	How to find solutions with farmers by working through L-FFS methodology
Olivier UWAMUNGU	Veterinarian (studying MSc in International Development)	HIR / Gicumbi District	L-FFS Master Trainer, District field technician HIR/RDDP Project	Famers themselves solve their problems and start discovering their ability to

				find solutions by themselves
Emmanuel RUTARAMBIRWA	Veterinarian	HIR / Rutsiro District	L-FFS Master Trainer, District field technician HIR/RDDP Project	Learnt how farmers are finding solutions to their problems and working toward sustainability of their actions
Paulin MUTANGUHA	Animal Scientist	Alliance of Bioversity and CIAT (ABC), Kigali Office	Consultant on Dairy Climate Smart Project, ABC	
Abdul Madjid SINDAYIGAYA	Animal Scientist	RDDP Headquarters, Kigali	RDDP / L-FFS Specialist	
Joseph NSHOKEYINKA	Animal Scientist	RDDP Headquarters, Kigali	RDDP/ Animal nutrition and Genetic improvement Specialist	
Gilbert MUTONI	Animal Scientist	ILRI/ RDDP Kigali	Consultant, Research Coordinator, ILRI Rwanda	

Participant expectations

The things participants hoped to accomplish during this workshop.

1. Formulation of Total Mixed Rations using locally available feeds resources in RDDP project sites
2. How to improve dairy cattle feeding practices
3. Knowledge on the best way to feed animals for production purpose
4. Different types of forages and their milk production potential
5. Understanding more on animal nutrition
6. To better understand the dairy value chain and different actors
7. How to better communicate with uneducated farmers
8. Better understanding of feed interventions implemented in RDDP project sites
9. A better understanding of the FEAST tool

The difficulties participants expected during the workshop:

1. Lack of learning materials
2. Calculations on dairy feed formulation
3. Unexpected phone calls
4. Inadequate time to allow for comprehensive discussions

The most important things that participants will miss at work during this workshop

1. Data collection on maggots' research on station
2. Interactions with workmates
3. L-FFS appointments with trainees and farmers
4. Coordinating farmer's groups
5. Participating in the passing on gift ceremony
6. Appointment to North Rwanda Revenue Authority
7. Interactions with beneficiaries
8. Monitoring daily field activities
9. Completing unfinished reports

How this workshop will help participants in their work?

1. Sharpen support to farmers in decision making to solve nutrition problem particularly total mixed rations and appropriate feed interventions using FEAST
1. To be a better trainer
2. To understand more about animal nutrition
3. Learn how to formulate and mix animal feed rations
4. To help farmers by giving correct answers/feedback to their enquiries effectively and confidently
5. Increase level of ToT knowledge and participatory approaches with farmers
6. To improve how to deliver scientific information on animal feeding
7. Improve on the use of learning materials
8. To improve on the follow up of health of dairy cows especially in feeding
9. Being better resource person in dairy production
10. To work as team with others

Summary of training content

Lesson/Topic	What was covered? Discussions, and lessons learned.
Lesson 1: Benefits of dairy farming	Discussed actors in the diary value chain and their role. Benefits of dairy – milk, manure, income etc. to smallholder farmers in their setting.
Lesson 2: Considerations before starting a dairy enterprise	Discussed consideration in setting up a dairy enterprise. Location i.e. climate, soils, suitable dairy cattle breeds – availability, cost. Land for constructing farm structures, growing fodder. Milk market both formal and informal. Water for cattle and cleaning shed etc.
Lesson 3: Setting up a dairy farm	Issues discussed included budgeting, putting up necessary structures, establishing feeds and selecting suitable breed of dairy cattle suited to environment. Also, a breeding plan and need to acquire skills and knowledge
Lesson 4: Digestion overview + implications of digestion process (digestibility):	Topics covered include simple explanation of the digestive system of ruminants, how fiber influences feed quality, intake, and digestibility, how quality changes with stages of growth, influence of feed processing (particularly chopping) on intake, feed losses and palatability, how that helps mixing of feed rations to increase quality etc. *Discussions mainly centered on optimum harvesting stages of forages in farmers situations and need to link this to feed conservation. Knowledge gaps and lack of resources to conserve feeds affects when farmers harvest forages*
Lesson 5 & 6: Nutrients and variation in their intake and requirements	Covered nutrient requirements oof dairy cow (Water, Energy, Protein, Minerals, Vitamins) by stages of growth, production & physiological status, and animal classes (calves, heifers, cows in milk, dry cows, and in-calf / pregnant cows etc. Discussions dwelt on water provision to animals on farms. Participants raised challenges of water supply in grazing, semi-intensive areas: animals are grazing many hours and less time for watering. In intensive systems, farmers adding salt to encourage water intake. Some animal refuse to take water despite being offered. Access to water is limited due the cost of water. We discussed factors that influence water intake. There is need to devise strategies with livestock keepers through L-FFS for changing of behaviour of cowboys to allow animals enough time to drink water. Recommendations 1. Master trainers need to do a gap analysis through L-FFS to determine why animals don't take water e.g. (timing of watering, water quality, what is fed etc. 2. Watering animals shall be included as topics of training and capacity building in L-FFS 3. ILRI to help design simple messages for water management and watering animals (for cowboys, cattle and owners).
Lesson 7: Feed consumption	Started by understanding key definitions: feedstuff, basal feed, supplement or concentrate feed, Dry Matter, Fresh matter, etc. The topics covered were factors that affect dry matter/feed intake, DM requirements and how to calculate DM requirements to quickly assess if the animal is getting sufficient nutrients. Group work to calculate DM requirement for different categories of animal with different forage species. This exited participants and catalyzed a lot of discussion amongst them on practicalities of feeding different forages on farms
Lesson 8: Nutrient sources for dairy cattle	Discussed the type of forages and feeds available locally are used to feed cattle – forages, concentrate feeds, purchased feeds etc.
Lesson 9: Basics about practical feeding	Feeding by production levels: Nutrient requirements depending on the maintenance requirements of the cow and desired production in terms of milk yield
Lesson 10: Record keeping	Covered production records, health records, breeding records, financial records. Q/A Why farmers resist to keep records? Reasons included, it takes more time, more work, some farmers are not educated (illiterate), negligence, don't know the importance/value of record keeping etc.

Day 2: Thursday, 29 April 2021

After a recap of day 1 outputs and plans for day 2, plenary discussions on forage seed production in Rwanda covered the following topics.

Lesson/Topic	What was covered? Discussions, lessons, and recommendations
Lesson 1: Introduction to forage seed production on smallholder farms	Covered forage seed production systems: informal forage seed system, formal forage seed system and intermediate. Local forage seed business (LFSB) model. Promoting the concept "producing what you can sell", using customer analysis and planning based on analysis. There were long plenary discussions reflecting on seed production in Rwanda. Key messages - Farmer have become reliant on forage seed subsidies. Need to change farmers mind set to start thinking about buying forage seeds, - There is need for consistency in forage seed production to maintain market and quantities. Need to compute production cost so farmers know what price to charge for different varieties. - Alfa alfa has a problem with seed production - Chloris Gayana is being attacked by aphids, while Kakamega 1 Napier grass seems to succumb to stunting disease. - No longer budget for seed production at RAB. Government encouraging private sector to take the lead in forage seed production. - Seed inspection has been moved to Rwanda Institute of Conservation Agriculture (RICA)
Lesson two: Establishing a pasture seed crop	Covered weed control, consideration in grass seed crop management (defoliation, day length, nitrogen fertilizer, irrigation, pests and diseases etc.). Seed harvesting (optimum time, harvesting conditions, indicators for optimum harvesting, seed moisture content etc. Harvesting methods and determinants.
Lesson 3: Post-harvest seed conditioning	Clean seed production, processing, cleaning, seed moisture levels, seed drying, minimizing seed damage during harvesting, seed viability, factors affecting variability etc.
Lesson 4 and 5: Seed packaging and storage	Packaging methods, kind of packages, quality, costs, etc., packaging conditions, damages during packaging etc.
Lesson 6: Seed storage	From harvest to the next planting season. Storage methods, pros and cons of storage methods, quality, costs, etc., storage conditions, damages during storage etc. There were discussions around Q/A: 1. Breaking dormancy of grass seeds (soaking in water, chemical treatment)/ measures to ensure high germination rates 2. Seed conservation and storage: Use of chemicals to preserve seed? Cost + hazards. Use of insect proof containers/bags 3. The use of vegetative/splits materials for forage seed establishment in small holder farm conditions

Observations and recommendations

1. The training revealed knowledge gaps in master trainers that need to be addressed:
    a. Knowledge gaps on optimum harvesting stages of forages and feed processing and conservation.
    b. Need for data on the yield potential of forages being promoted in RDDP sites.
    c. Simple guidelines for dairy rations balancing along with promotion efforts of improved forages. Related to this, there is a high demand for information on and knowledge on ration formulation
2. There is need to introduce more grazing cultivars in sites dominated by extensive systems e.g. Nyagatare district
3. Need for simple messages for water management and watering animals in extensive systems (for cowboys and cattle owners).
4. Need to investigate further reports that *Chloris gayana* is being attacked by aphids, while Kakamega 1 Napier grass seems to succumb to stunting disease.

End of workshop assessment

Figure 1: Participants assessment of the different attributes of the training (Score out of 4)

Questions	Summary of responses from participants	Why?
Which topic did you find easiest to understand?	The topics listed included planning a dairy farming, forage seed production and fodder varieties and the use of the training materials.	Participants found the topics very practical in rural areas and applicable at field level. The management of the forage seeds is the most critical issue required for forage production. The trainer was well-organized.
Which topic was most difficult for you to understand?	Majorly, participants found the topics on basic feed formulation e.g. calculations on Dry Matter Intake, DE, TDN etc. more difficult	Because calculations are not very to understand and needs more time and practice. It was taught last and in the afternoon after eating!
What aspects of the workshop were the most valuable to you?	Some of the aspects listed include best way of handling seeds, pasture establishment, conversion of DM into fresh matter, forage seed management. The training materials contain useful information.	Covered the most frequently asked questions by facilitators and farmers. The use of tangible examples and practical exercises made topics more understandable and comprehensible. Plenary discussions were very useful.
What aspects of the workshop were not valuable to you?	Two topics that came up were keeping records and feed formulation	Feed formulation was not valuable given the lack of a feed advisor application. No reason was given for farm records.

Overall, participants were satisfied with the workshop. They expressed a need for practical sessions on feed formulation using a feed application and if possible, on farmers' field. Most participants were not comfortable with the feeds formulation topic and this could be because most of them have a background in veterinary medicine and not in nutrition.

Annex 1: Training program

Time	Session Description	Approach	Whom?
Day one – 28 April 2021			
8:00 - 8:30	Arrival and registration	Registration desk	Gilbert
8:30 - 9:00	Introductions and welcome	Plenary and ice breaker	Joseph / Gilbert
9:00 - 9:30	Participants expectations, setting the ground rules of participation	Plenary participatory exercise	Ben
9:30 - 10:00	Brief background of the workshop Presentation	Presentation	Ben
10:00 - 10:30	Health Break	Time out	Gilbert
10:30 - 11:00	Identifying the benefits of dairy farming	Slides and Participatory exercise	Ben
11:00 -12:30	Setting up a dairy farm: -Considerations - Steps	Participatory plenary discussion	Ben
12:30 - 1:00	Question and answer – discussion session	Plenary discussion	Ben
1:00 - 2:00	Lunch Break		Gilbert/Joseph
2:00 - 3:15	• How Dairy cattle digest feed: implications for feeds and feeding • Nutrient sources for dairy cattle • How much feed dairy cattle consume and why, the concept of Dry Matter	Participatory plenary	Ben
3:15 - 3:30	Health break		
3:30 - 4:30	• Buying fodder, concentrates and minerals • Nutrient potential of different feed • Nutrient requirements of different classes of dairy cattle	Participatory plenary	Ben
4:30 - 5:30	• Basic ration Formulation • Practical feeding guidelines • How to keep and use farm records	Participatory plenary	Ben
5:30	Close		

Time	Session Description	Approach	Whom?
Day two – 29 April 2021			
8:00 - 8:30	Arrival and registration	Registration desk	Gilbert
8:30 - 9:00	Introductions and welcome	Plenary and ice breaker	Joseph / Gilbert
9:00 - 10:00	Introduction to forage seed production	Plenary participatory exercise	Ben
10:00 - 10:30	Health Break	Time out	Gilbert
10:30 - 11:30	• Establishing a pasture seed crop • Seed harvesting	Slides and Participatory exercise	Ben
11:30 - 12:30	Post-harvest seed conditioning	Participatory plenary discussion	Ben
12:30 - 1:00	Question and answer – discussion session	Plenary discussion	Ben
1:00 - 2:00	Lunch Break		Gilbert/Joseph
2:00 - 3:00	• Post-harvest seed conditioning	Participatory plenary	Ben
3:00 - 3:15	Health break		
3:15 - 4:00	• Seed packaging • Seed storage	Participatory plenary	Ben
4:00 - 4:30	Review entire course contents	Participatory plenary	Ben
4:30 - 4:45	Question and answer – discussion session		
4:45 - 5:00	Certificate award and close		Gilbert/ Joseph/ Ben

Annex 2: Pre-workshop assessment

Please answer the following questions as precisely as possible:

Name:_____	Age (years): _____	
Work Position:_____	Years): _____	Months _____
How long have you been in the current position?	Years): _____	Months _____
Where were you working before you joined this organization?	_____	
How long did you work in that organization?	Years): _____	Months _____
What is your highest level of academic training? (Please tick)	Primary Vocational/Certificate University	Secondary Diploma
Approximately how many farmers do you serve?	_____	
What is the average number of dairy cows in those farms?	_____	
What is the approximate level of exotic blood in the cows? (Please tick)	Cross (50%) Pedigree (over 90%)	High grade (75%) Other, please specify _____
What aspects of dairy farming do you mostly give advice on? (Please tick)	Breeding Housing	Feeding Health
Which aspects of feeding do you advise on most of the time?	_____	
Have you gone through a ToT before? (Please tick)	Yes [_____]	No [_____]
If yes,	When?_____	What were you trained on? _____
If no,	Why haven't you attended any training?	
What is your most important source of information?	Books Radio Other (specify)	Internet TV

Annex 3: End of workshop assessment

Instructions: For each statement, mark whether you disagree or agree based on the following rating system.

1. Strongly Disagree
2. Somewhat Disagree
3. Somewhat Agree
4. Strongly Agree

Give instances from the training session to illustrate your response.

If you disagree with any of the statements below, please state why.

1. The presentations were clear and well-structured. ……
2. The instructor was knowledgeable on the subjects. ……..
3. The instructor kept the participants active and focused. ……
4. I heard the presentations clearly. ……
5. The instructor used simple words. ……..
6. The plenary sessions were well conducted. ……..
7. The practical sessions were well organized and executed. ……
8. The training method was appropriate and made learning easy ……
9. The time allocated for various topics and activities was adequate ……
10. Which topic did you find easiest to understand? ……
    Why? _____
11. Which topic was most difficult for you to understand? ……
    Why? _____
12. What aspects of the workshop were the most valuable to you? And why?

    ……

    ……
13. What aspects of the workshop were not valuable to you? And why?

    ……

    ……
14. Overall Satisfaction: Please indicate your satisfaction with this workshop by selecting the appropriate number (1=Dissatisfied, 2=Somewhat dissatisfied, 3=Somewhat satisfied and 4=Satisfied).