

Supporting training of trainers (ToTs) to formulate feed rations for farmers using the FeedCalculator app in Uganda

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Cover photo—FeedCalculator app use demonstration during a training session held in Uganda (photo credit: Single Spark B.V.)

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I Background

Supporting the training of trainers (ToTs) was part of the activities for reinforcing the PigSmart: digitalizing the small-scale pig value chain on the More Pork II project in Uganda. The PigSmart platform are aimed at: (i) strengthening digital extension in the small-scale pig value chain, (ii) developing digital extension use cases in the small-scale pig value chain, (iii) helping small-scale pig farmers increase production and income from better access to timely, relevant and actionable information (Kang'ethe 2020). The FeedCalculator application was selected as one of the digital solutions to support farmers and feed producers. The Single Spark B.V. developed FeedCalculator app, which is a mobile app based software, (<https://www.feedcalculator.org>) and is being promoted by Single Spark Ltd as an independent tool for digitalizing livestock production in various ways such as feed formulation, feed planning, linkages to input suppliers and markets as well as advisory services. The app is freely downloadable from the Google Play store and is free to use.

This activity was conducted between November and December 2020 in the Mukono and Masaka districts of Uganda. Fifteen (14 male and 1 female) government and private extension service providers were trained on the use of the FeedCalculator app and feeding practices over a two day training program. The training curriculum included the science of pig feed ingredients, FeedCalculator app-based pig feed formulation, pig feed production, pig feeding practices, pig watering requirements, technology transfer approaches and facilitating farmer field school trainings. After the training, each of the trainees demonstrated the ability to pass on the acquired skills and knowledge to farmers.

2 Objectives

The objectives of this activity were to:-

- back up ToTs in the training of farmers on pig feed formulation and feeding using the FeedCalculator application
- assess the ability of ToTs to pass on skills and knowledge on feed formulation and feeding to farmers.

3 Activity design and implementation

Mobilization: The feed expert/consultant from Single Spark B.V. assigned training days and schedules for each of the 15 trainers. The trainers then mobilized about 10 farmers or participants for at least one hour training. The farmers or participants in agreement with the trainers determined the time and duration of the training. The trainers used their means and resources to mobilize the farmers.

Training venues: The trainer in agreement with the participants identified training venues, which included homes, farms, churches and subcounty facilities. It was entirely up to the trainers to either hire or buy or borrow training venue facilities and material including seats, markers and charts among other training material.

Adherence to COVID-19 standard operating procedure (SOP): The number of trainees was limited to less than 30, use of spacious venues was encouraged, use of masks were mandatory for all participants, social distance seats were organized.

Training sessions: The feeds expert/consultant took a back seat among the participants while the trainer took the lead in the training sessions. The trainers used training approaches of their choice to train the participants. The training was conducted in Luganda, but the English language was sometimes used for clarity and communication to participants who could not speak Luganda. The trainers would select a particular topic based on the identified needs of the participants. The trainers used training aides of their choice to make participants acquire the intended skills and knowledge about pig feeding practices. All participants were recorded.

Feeds expert role: The feeds expert gave an introductory remark about the overall project. The feeds expert supplemented the answers to questions in the training to clarify highly technical questions and correct any erroneous information that may have been passed on. The expert filled in a supporting tool (see appendix) during the training and after the training using information gathered through interviews with the trainers. The expert also discussed with the trainers and guided them on how to improve their training skills and abilities.

ILRI staff role: The project staff gave introductory remarks explaining the role of ILRI and Single Spark B.V. in the project for developing the pig value chain in Uganda. They also observed the flow of the training sessions and assessed the performance of trainers.

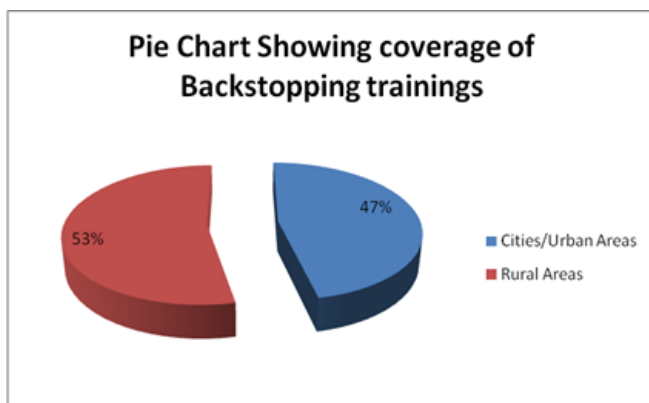
Training duration: The training run for a maximum of one day and a minimum of one hour. This time was not enough to complete the entire curriculum, however, this training was considered a kick-starting training activity that could be continued in future.

After training follow up plan: After the kick-starting training, the trainers were encouraged to organize more training sessions for either the same participants to complete the curriculum or for new participants.

4 Results

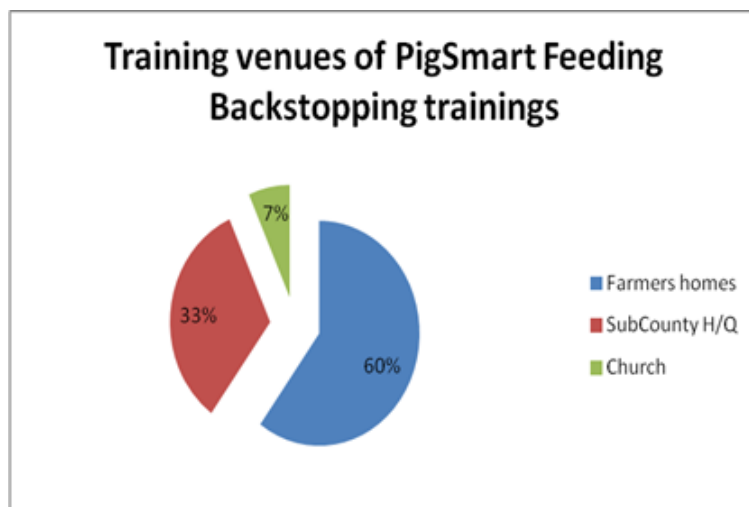
Training coverage: Supporting the training sessions were organized in both urban/cities and in rural areas. There were more training sessions organized in the rural areas compared to the urban areas as shown in Figure 1.

Figure 1. Urban-rural distribution of supporting training sessions.



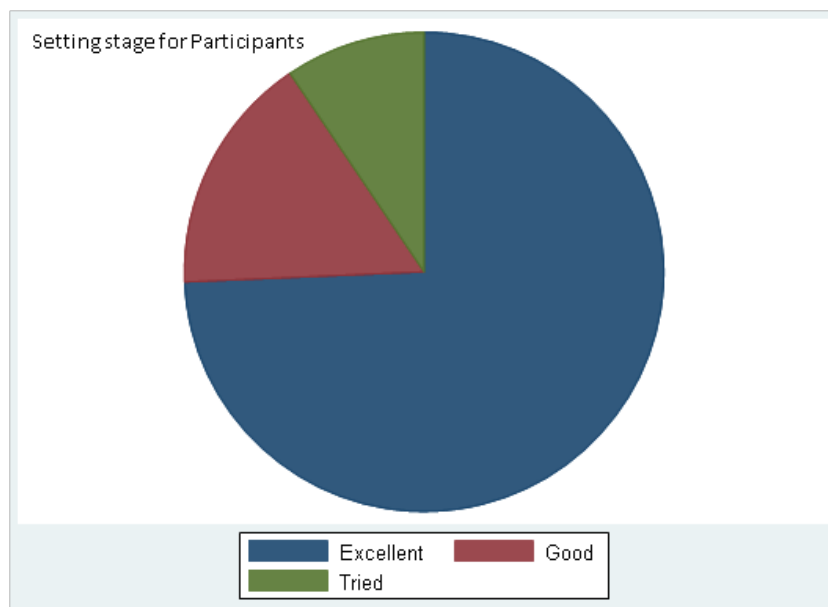
Training venues: Use of a diversity of training venues was observed reflecting community contribution towards the pig feeding training sessions. Training sessions were held in homes, subcounty headquarters and in churches. Figure 2 gives the proportion of different types of training venues used by trainers.

Figure 2. Tallies of training venues.



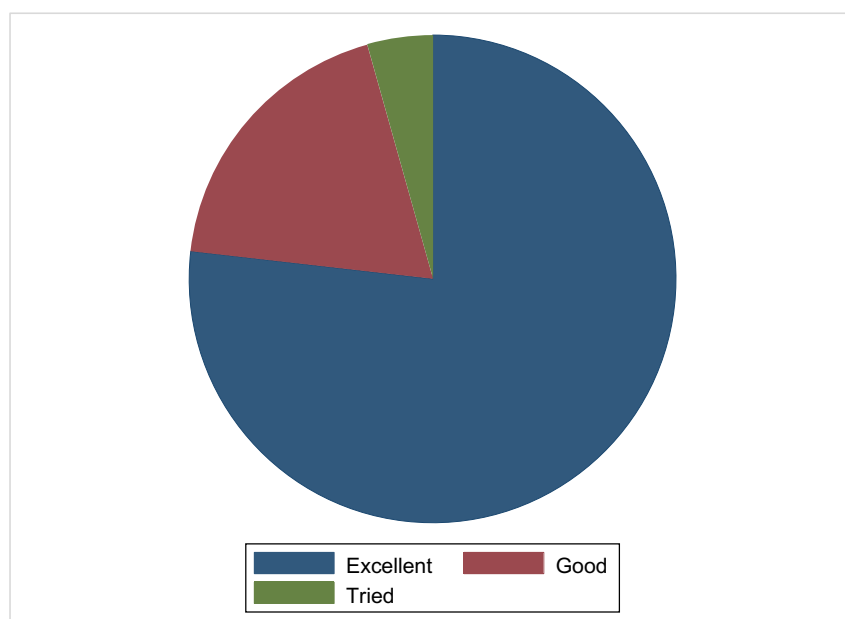
Trainers' competence: Generally, the trainers demonstrated the ability to mobilize and transfer skills and knowledge to farmers. The average ratings of the trainers based on the supporting tools (see appendix) used during the 15 training sessions conducted from 27 January to 12 February 2021 are shown in Figures 3–6 below.

Figure 3. Scores of trainers in setting the stage for the participants.



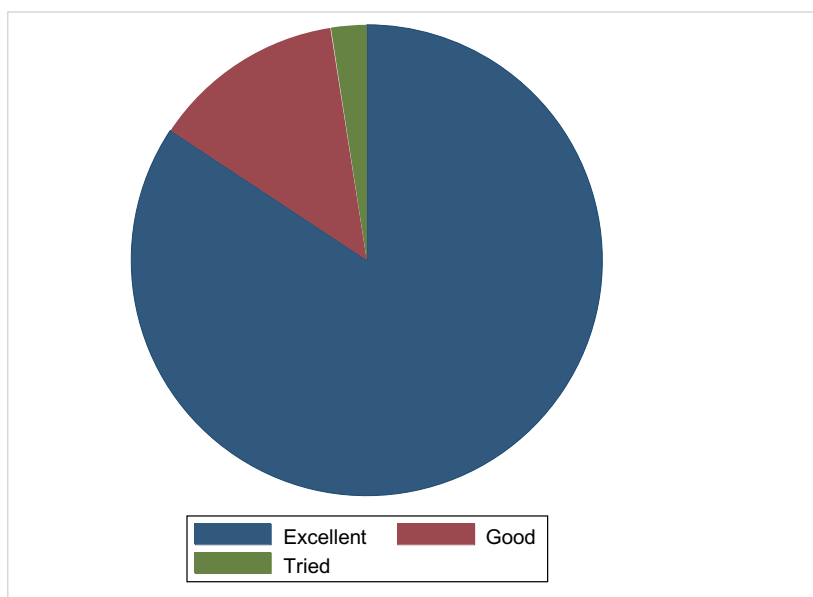
Data from supporting tools and analysed by Stata/IC 15.0.

Figure 4. Scores of trainers in use of appropriate methods of training.



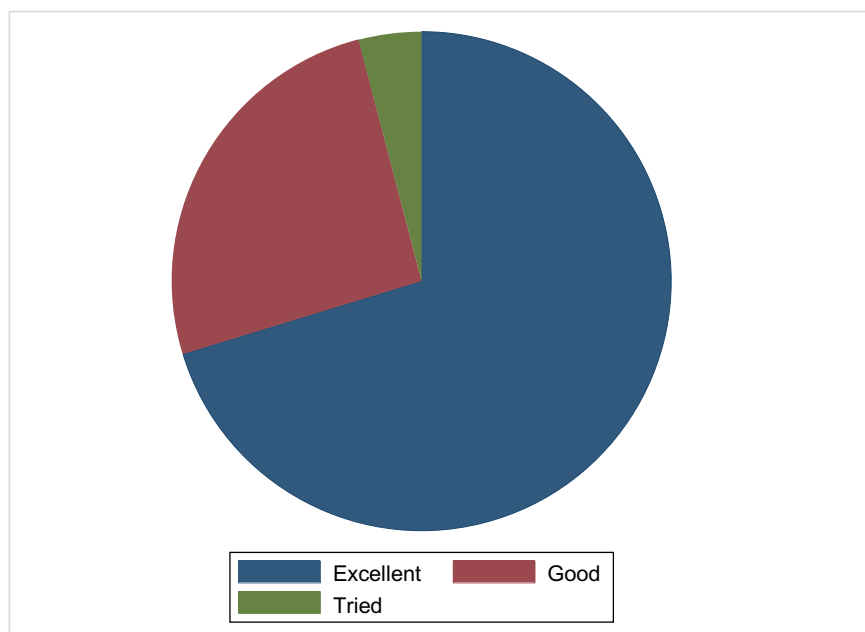
Data from supporting tools analysed by Stata/IC 15.0.

Figure 5. Scores of trainers in the ability to conduct/facilitate training.



Data from supporting tool analysed by Stata/IC 15.0.

Figure 6. Scores of trainers in accuracy of content on PigSmart feeding.



Data on supporting tool analysed by Stata/IC 15.0.

Trainers' contribution to training sessions: It was observed that the trainers sourced for resources to organize the training using extra inputs including: (i) notebooks and pens for participants, (ii) hired or borrowed seats for the training, (iii) spent their funds to purchase airtime to organize farmers and (iv) bought training material such as feed ingredients, flip charts, markers etc. The trainers bought some of the feed ingredient samples while the Single Spark B.V. feeds expert provided the rest.

Trainers' peer learning: Trainers attended training sessions conducted by fellow trainers to learn from one another; this improved their performance as they were motivated by their colleagues.

Training material: Trainers demonstrated correct use and interpretation of training manual and workbook content as well as customized use during the training. Some of the trainers mentioned that they read through all the training manuals and workbooks in preparing for the training. This deepened their understanding of pig feeding.

Training aides: Trainers used all available training aides including phones installed with FeedCalculator app, samples of feed ingredients, farmers ingredient selection guides, workbooks and manuals.

Training mobilizing approaches: Trainers used various mobilizing approaches including cooperatives, local radio announcements, calls to known pig farmers, visits to known pig farmers among others. The number of participants were biggest (over 20 farmers) in the training sessions that used local radio announcements. Figure 7 below shows the location of the local radio station broadcasting in Bukooza, Nabaale and Mukono.

Figure 7. Local radio station broadcasting in Bukooza, Nabaale and Mukono.



Photo: Single Spark B.V.

Trainer to farmer ratio: The training had varying attendances ranging from 6 to 25 pig farmers.

Figure 8. A farmer acting as a pig to demonstrate live weight estimation as everyone looks in a small attendance training.



Photo: Single Spark B.V.

The feeds expert guided the trainers to mobilize a group of about 10 pig farmers for each training. However, to cater for farmers who turned down the invitation at the last minute, trainers invited more than 10 farmers. Also, in places where invitations were open and made through local radio announcements, the attendance were more than 10. Based on this observation, training was best when attendance was not more than 20 farmers. This enabled the trainers to engage every participant effectively, call every participant by name, demonstrate the use of FeedCalculator app well and they could also fit well in most types of venues. Figure 8 above shows a farmer acting as a pig to demonstrate live weight estimation as everyone looks in a small attendance training.

Synergy from other projects: A case in Kyesiga subcounty, Masaka district where community-based facilitators (CBFs) with smart computer handsets were invited to attend the training revealed that projects such as agricultural cluster development project (ACDP) have supported digitalizing communities by giving smartphones to each of the CBFs in selected districts in Uganda. Also, it was observed that the CBFs were more skilled in using smartphones. ACDP is running in a number of selected districts in Uganda including: Masaka, Amuru, Kalungu, Iganga, Ntungamo, Nebbi, Mpigi, Rakai, Bugiri, Namutumba, Nwoya, Gulu, Kabaale, Bushenyi, Isingiro, Maracha, Arua, Yumbe, Kyotera, Bugweri, Omoro, Bunyangabu, Rukiga, Rubanda and Pakwach (<https://www.agriculture.go.ug/agriculture-cluster-development-project-acdp-rolled-out-to-more-districts-across-uganda/>). BRAC Uganda gave a woman a smartphone for use in village women lending groups in Kasawo subcounty, Mukono district.

Introducing FeedCalculator app: It was observed that the needs of the pig farmers are beyond feeding. Trainers, however, demonstrated the ability to narrow down the training to only pig feeding. After consensus and common understanding by the farmers, it was proposed that formulation of pig feed was critical, hence the trainers introduced the FeedCalculator app as a solution to quality and efficient pig feeding ration formulation. The trainers shared testimonies of their farms and other farmers using the FeedCalculator app. Pig farmers who had smartphones downloaded the FeedCalculator app and signed up. Four android phones, one owned by the host farmer, two by the feed experts and one by the trainer were used for demonstrating the use of the FeedCalculator application to make

pig feed recipes to farmers. One phone was used by a small group of 3 to 4 farmers. Figure 9 below one of the small-scale pig farmer (woman) demonstrating how a FeedCalculator app works on her smartphone.

Figure 9. One of the small-scale pig farmer (woman) demonstrating how a FeedCalculator app works on her smartphone.



Photo: Single Spark B.V.

Of the pig farmers who had smartphones, 50% downloaded and signed up for the FeedCalculator app. The number of those who downloaded the app would have been more if it were not for the restriction of access to mobile internet. Some farmers who appreciated the relevance of the FeedCalculator app promised to sell one of their pigs to buy a smartphone for formulating pig feeds. Figure 10 below shows one of the ToTs training small-scale pig farmers under COVID-19 SOPs in Gayaza, Masaka.

Figure 10. One of the ToTs training small-scale pig farmers under COVID-19 SOPs in Gayaza, Masaka.



Photo: Single Spark B.V.

Relevance of the curriculum: In the Kasawo second training session, two trainers teamed up to conduct training sessions in one subcounty shows how trainers valued the curriculum on pig feeding for farmers. In the first training, 12 out of 15 invited farmers attended the training. After 8 days, surprisingly 23 farmers attended the second training while only 15 farmers were invited. The 8 farmers who were not invited learned about the training from fellow farmers who attended the first training session. Also, farmers stayed up to the end of the training. Only 3 out of the total 197 participants left the training before the closing remarks. The fact that farmers got engaged for an average of 3 hours, shows that they must have found the skills and knowledge shared in the training relevant to them. In many of the training, participants demanded a second training on aspects of feeding that were not covered that day. Most important of all, even though more training was conducted in the afternoon, no participant was noticed dozing during the training sessions. Figure 11 below shows small-scale pig farmers after the training held at Nama subcounty in Mukono District.

Outputs of the back up training on feed formulation using the FeedCalculator app:

- i. A total of 195 small-scale pig producers (72 men and 123 women) were trained in pig feed ration formulation using the FeedCalculator app.
- ii. A total of 185 farmers ingredient selection guides were distributed to farmers.
- iii. A total of 15 extension service providers (14 men and 1 woman) were assessed and confirmed to have the ability to transfer skills and knowledge of pig feeding using the FeedCalculator app.
- iv. Three men extension service providers were trained in pig feeding using the FeedCalculator app.
- v. Over 20 pig farmers (12 men and 8 women) downloaded and signed up for the FeedCalculator app.
- vi. One male feed miller was trained in pig feeding and pig feed production using the FeedCalculator app and linked to the pig farmers in the area.
- vii. One politician was envisioned about the pig feeding technologies especially the FeedCalculator app.

Figure 11. Small-scale pig farmers after the training at Nama subcounty, Mukono District.



Photo: Single Spark B.V.

5 Lessons learned

During the training, several lessons were drawn based on farmers' feedback, reactions and observations on the use of feed formulation trainers to train farmers. The lessons may be relevant for scaling up this approach.

Most feed millers and feed ingredients aggregators supplied disappointing quality and reliability of feed to the farmers. This was mentioned as a limitation to the adoption of improved pig feeding practices.

Farmers expressed their concern about the limited access to pig input and output products markets. This was raised as a limitation to the development of the pig value chain in Uganda.

Pig feed formulation trainers offered the farmers to be active and happy with the practical training and learning activities. This suggests that trainers could deliver better if they are facilitated with training aides for activity-based interactive training for farmers.

Using CBFs who are closer to the communities and have smartphones, could enhance the adoption of feed formulation using the FeedCalculator app.

Some of the trainers attended the training of colleagues to learn from one another. This suggests that the 15 trainers can mentor their fellow extension service providers in the pilot districts.

There are other projects who have given smartphones to community agents like CBFs. This provides an opportunity to leverage on such projects to scale out the use of the FeedCalculator app in communities.

Figure 12. Farmers in Kayugi, Masaka District identifying feed ingredients during training.



Challenges of using the FeedCalculator app in communities

The main challenge for this activity is access to a stable internet connection and the limited use of smartphones partly due to government restrictions due to security concerns. This affected the rate at which small-scale pig producers downloaded the FeedCalculator app during the training.

Recommendations for scaling up the use of pig feed formulation trainers

Based on observations and reflections, the following recommendations are made for the upscaling of the impact of using pig feed formulation trainers in Uganda:

- Assign groups of selected small-scale pig producers in the pilot districts to trainers. Each of the trainers can train and nurture the farmers until their pig feeding practices are smart enough. There is a need to work out ways for incentives to trainers such as transport and communication allowances.
- Facilitate trainers with training aides and material for conducting activity-based training sessions in communities. These may include a sample feed ingredient, weight estimator metre, FeedCalculator banners, farmer ingredients selection guides, among others. Figure 12 above shows farmers in Kayugi, Masaka District identifying feed ingredients during a training session.
- Support trainers to set up pig feed formulation demonstrations or reference farms for a mindset change in the communities.
- Identify, train, nurture, certify and link nearby feed millers and feed ingredients aggregators to the profiled pig farmers. This will restore the confidence of pig farmers in the quality of feed ingredients and pig feeds sold in the market. It will also avail farmers with reliable nearest sources of quality feed ingredients and pig feed.
- Display reliable feed millers, feed ingredients aggregators and trainers in the FeedCalculator app 'Find Input Suppliers' handle would increase the number of beneficiaries of the pig feed formulation. All FeedCalculator app users who are pig farmers will be able to contact either the pig feed formulation extension service provider or the feed miller with good quality feed ingredients or pig feeds.

6 Reference

Kangethe, E. 2020. PigSmart: Digitalization of the small-scale pig value chain in Uganda. Poster prepared for the virtual livestock CRP planning meeting, 8–17 June 2020. Nairobi, Kenya: ILRI.

7 Appendix

PigSmart feeding trainers supporting tool

Trainer's name:	_____
Date:	_____
Location of the training:	_____
Number of trainees:	_____
Training started at:	_____
Training ended at:	_____
Mentor/observer:	_____

Observational and interview notes

S/No.	Section	Detailed assessment	Tick what applies		
			Tried	Good	Excellent
1	Setting the stage (How the trainer introduces the theme of the training to the group)	Did he/she assess the trainee needs?			
		Did he/she establish credibility with the group?			
		Did he/she describe the intentions or objectives of the session relating to the perceived needs?			
		Did he/she outline the agenda for the sessions?			
		Did he/she establish some ground rules?			
2	Methodology of training (What training methods were used in the training sessions)	Did he/she blend different methods?			
		Did he/she involve trainee participation?			
		Did he/she use classical examples or illustrations to make participants understand?			
		Did he/she adapt or prepackage the curricula to his/her own teaching style and the needs of a particular group of learners?			
		Did he/she use practical demonstrations?			

S/No.	Section	Detailed assessment	Tick what applies		
			Tried	Good	Excellent
3	Delivery	Was he/she audible enough?			
		Did he/she control the class?			
		Did he/she move around, use hands and otherwise provide visual variety?			
		Did he/she begin and end in time?			
		Did he/she link the sessions correctly to avoid disconnection in understanding?			
		Did he/she demonstrate reasonable comfort with the subject and with his/her role as a trainer?			
		Did he/she answer farmers' questions appropriately?			
		Did the trainer stimulate sharing of indigenous knowledge from participants?			
		Did the trainer exhibit respect for trainees?			
4	Content (What information does the trainer provide)	Did the trainer provide complete, accurate information?			
		Did the trainer use appropriate training aides?			
		Did the trainer translate key terminologies accurately?			
		Did the trainer emphasize key messages?			
		Did the trainer explain the FeedCalculator app technology well?			
5	Trainers self-assessment (Mentor interviews the trainer for self assessment after the training)	What did you do well? Mentor fills here as he/she interviews the trainer			
		What did you do poorly? Mentor fills here as he/she interviews the trainer			
		What did you want to improve? Mentor fills here as he/she interviews the trainer			
6	Summary of mentors feedback to trainer (Mentor reviews the above detailed assessment and summarizes feedback to the trainer)	What did the trainer do well? Mentor fills based on observation			
		What did the trainer do poorly? Mentor fills based on observation			
		What did the trainer needs to improve? Mentor fills based on observation			