

Report on Asia Dairy Network's E-Learning program on "Feeding management of small holder dairy cattle in tropical Asia", March/April 2014

John Moran, Coordinator, Asia Dairy Network, Apr 2014

Over the last 2 to 3 years, John Moran, in collaboration with FAO, has prepared an E-Learning program on "Feeding management of small holder dairy cattle in tropical Asia" with a pilot program run during the last two months of 2013 and a second program run during March/April 2014.

The **E-Learning program objective** is to provide an opportunity for the dairy stakeholders to gain a more objective, comprehensive and technical understanding of the complex nature of the feeding management decisions carried out by successful and profitable smallholder and large scale dairy farmers in the tropics.

The **target audience** for the E-learning program includes:

- Extension workers working directly with dairy farmers
- Government and agribusiness dairy advisers
- Advisers working in the Non-Government Organisations (NGO) sector
- Progressive smallholder and/or large scale dairy farmers/managers
- Dairy cooperatives and their support infrastructure educators (both degree and certificate level)
- Senior government management and policy makers

DETAILS OF E-LEARNING PROGRAM

There are 16 modules (lessons) in the program covering the following areas of feeding management:

- Principles of dairy nutrition and feeding management as cows move through their annual lactation cycle
- Quantification of the likely milk responses to changes in intakes of feed nutrients so that a ration can be formulated to achieve a targeted milk yield
- A practical session on trouble shooting feeding problems
- Specific aspects of dairy production technology such as rearing young stock and feeding for improved fertility

These 16 modules are as follows:

1. Brief introduction to tropical smallholder dairy farming
2. Principles of feeding management
3. Key nutrients in feeds
4. Key nutrients in milk
5. The lactation cycle
6. Quantifying the nutrient requirements of milking cows
7. Supplying these key nutrients with forages
8. Balancing rations with supplements
9. Formulating a ration
10. Milk responses to supplements
11. Trouble shooting feeding problems

12. Feeding for improved fertility
13. Feeding pre-weaned calves
14. Feeding weaned heifers
15. Measuring body condition score
16. How feeding management impacts on other aspects of herd management

The program consists of each module comprising of a set of structured slides. Slides contain learning material, tests and supplementary files for further reading. During the learning process participants are led from one slide to another sequentially, although they can also jump from one to another slide. The contents of each module are generally organised in the following sequence:

1. Welcome
2. Learning objectives
3. Introduction
4. Learning contents
5. Summary
6. Self-assessment using Knowledge Assessment Tasks (KAT)
7. Further readings

A pilot program was run during late 2013 under the auspices of the Smallholder Dairy Development Programme (SDDP) being implemented in Bangladesh, Myanmar and Thailand. This is the first intervention under the Strategy and Investment Plan for Smallholder Dairy Development in Asia – A glass of Asian milk for every Asian child, developed by APHCA (Animal Production and Health Commission for Asia and the Pacific) member countries and financially supported by CFC (Common Fund for Commodities) FAO and APHCA. Accordingly, representatives of three Bangladesh dairy agencies registered for the program.

THE SECOND E-LEARNING PROGRAM

The second E-Learning program arose from the E-Conference in by-product feeding run by the Asia Dairy Network (ADN) in late 2013. A general invitation was made to the 500+ participants and the first 16 who replied were invited to join the program. They were also asked to justify their inclusion in the program. Only 16 were accepted to allow for two separate Skype sessions to be run in collaboration with the program.

As all 16 were fully employed in their professional activities, it was decided to ask them to undertake 4 modules each week, hence complete the program in 4 weeks from 17 March to 14 April. In addition to each of them receiving a CD with all 16 modules, they were invited to attend 3 Skype sessions (Virtual Classrooms) during the 4 week period. These Skype sessions, conducted on 18 March and 1 and 11 April, with the first and last sessions facilitated by members of the APHCA Dairy Asia team in Bangkok.

Each participant was sent an Expectation and an Evaluation form to complete. These are included in the Appendix of this report. Of the 16 people sent the forms, only 8 returned completed Expectation while 10 completed Evaluation forms.

The 16 participants came from Bangladesh (3), Malaysia (3), Indonesia (3), India (2), Australia, Philippines, Thailand, Zimbabwe and United States. They covered a wide range of dairy stakeholders which included 5 researchers, 3 teachers or trainers, 4 consultants or advisers, 2 veterinarians and 2 farmers. Only 5 had regular advisory contact with other dairy farmers.

There were initial problems with the opening of the modules. However, an instruction sheet was developed and distributed to all participants to overcome this problem.

Feedback from the evaluation forms

The general comments made in the Evaluation indicated that the participants expected a series of sessions on many aspects of feeding management and they then gained considerable knowledge in these areas, so effectively the program could claim “mission accomplished”.

To one participant, the key objectives were firstly, to learn more about the relationship between feed and animal production and secondly, to engage with other practicing dairy scientists. These were both met and the presentations were clear and simple to read and understand.

From another participant “Although I have undergone animal nutrition in my undergraduate studies, I learnt a lot new in a very simple and easy manner. Until attending this course, my knowledge on formulating feed ration was inadequate. However now I’m able to guide them in proper manner and I have started my effort in that direction. ”

Another participant suggested that FAO should arrange a Practical Dairy Husbandry Learning-Workshop with the participants of the by-products E-conference of this region since tropical dairy farming is an emerging issue for dairy development of South and South-East Asia.

All 10 considered the program “about right”, while several wanted more content in the E-modules and more KAT’s while half of the respondents wanted more Skype sessions. The majority wanted a refresher course within 6 months. The 10 returned Evaluation forms could be summarised as follows:

Program Delivery

Overall program; Not enough (0), About right (10), Too much (0)

E-Modules 1-16; Not enough (1), About right (9), Too much (0)

Knowledge Assessment Tasks; Not enough (2), About right (7), Too much (1)

Skype sessions; Not enough (5), About right (5), Too much (0)

Overall rating of program: Excellent (0), Very good (7), Good (3), Not good (0)

When to conduct a refresher course: Within 3 months (1), 6 months (7), 12 months (2)

Weaknesses

- Problems with the Skype technology was routinely mentioned as a major problem, as this was very inconsistent on each of the three sessions. This led to fewer attendees at the sessions.
- One participant listed the “basics of nutrition” as a weakness, but with no further clarification.
- There could be more specific information on the growing and harvesting of different forages
- Lack of information on milking buffaloes
- Personal time management
- Time zones across the world for concurrent Skype sessions
- Not enough Skype sessions
- Many participants considered there to be no weaknesses

Improvements in course structure

- Having to pass all KAT’s before being able to move onto the next module
- Introduce farmer case studies to better develop participants’ learning
- Include specific case studies in ration formulation
- Farm visits (impossible with E-Learning programs)
- Conduct before/after course assessments of skills and knowledge

- Provide video footage of different forages
- Improve Skype reception with high speed facilities
- Provide more Skype sessions to allow for greater discussions
- Each Skype session should cover fewer modules
- Divide Skype groups into those with very limited experience and those with more regular dairy experience. This second group would refer to those who advise dairy farmers.

Improvements in course content

- Include section of frequency of feeding in relation to season and level of milk production
- Include section on calf separation at birth and suckling new born calves
- Include section on milking buffaloes
- Include section of feeding breeding bulls
- Identify limiting factors to achieving on calf per cow per year
- Include a specific section on heat (and cold) stress
- Make modules more simple and applicable to participants' needs

Most important messages/information

- From one participant “Based on my learning it was the forage section. But from a holistic perspective it would have to be the nutritional requirements of cows.”
- Assessing dung quality and making the necessary dietary modifications.
- Prevention of milk fever.
- Animal responses to changes in feeding management
- Community fodder entrepreneurs and fodder social business development. In other words, having a population of contract fodder producers separate from cow farmers. This is a specific concept for the flood-prone dairy farmers of Bangladesh.
- Body condition scoring of animals to help plan feeding management
- Resulting end-products of different types of feeds and how they are used by the cow.
- Cows are among the animals that respond to feeding very quickly. Thus any changes you made can easily take effect, for the better or for the worse.
- Computer program for ration formulation

Least useful messages/information

- Everything was useful, it just depends on your background in nutrition.
- Nothing, as all the information was useful

Reflections on the program

- I enjoyed the program, overall I already had the nutrition knowledge, my learning came from the forage species and some of the constraints the farmers have.
- The program was highly useful for my teaching and extension services
- As a veterinarian but not yet a nutritionist, the training will help me a lot on understanding more of the concepts in ruminant nutrition, specifically milking cow nutrition. The training will be another tool, which I can use in re-evaluating the existing diets in the farm, and improve not only our milk production but the growth of young replacement stocks. I find that ruminant nutrition is simple and at the same time complicated.
- One participant was after more information and perhaps separate short courses on specific subjects, for example feeding and reproduction; pasture improvement; feeds formulation; and waste management.
- Advisers with specific roles, such as breeding management, would have liked more on their particular speciality e.g. semen evaluation, overcoming repeat breeding problems.

Participants reported that the E-Learning program will be of benefit in their routine day to day dealings with small holder dairy farmers.

- The difficulties with language can only be overcome by selecting participants with clear English speaking skills or at least having an interpreter for any virtual classroom sessions.
- There must be a better way to orally (and visually) interact with participants as group Skype meetings seem to be next to useless in many SE Asian countries. If a better system costs money, then so be it, as it is a necessary expense in any internet training program.
- The CD needs to be modified for easier (and simpler) access to the modules. The course curriculum is good technically so needs no attention.

Questions from the Skype sessions

The Skype sessions provided an opportunity for participants to ask specific questions about their own experiences in dairy cow feeding management and the following are some of the questions asked during these sessions. The full answers are provided in the Q & A Forum in the Dairy Asia website (www.dairyasia.org).

- May I know the amount of microbial protein synthesized in the rumen in dairy cattle reared in tropical countries and the percent contribution to the total protein requirement of dairy cows? (*Dr. Vasanthakumar, India*)
- Among the various oil cakes and meals commonly used for feeding dairy cattle, which is superior and why? (*Dr. Vasanthakumar, India*)
- To counteract sub-acute rumen acidosis (SARA), feeding of sodium bicarbonate is recommended. Are there any negative effects due to feeding of soda bicarbonate, such as rebound acidity? (*Dr. Vasanthakumar, India*)
- My objective in my 100 cow herd is for every cow to have one calf every 12 months. In my herd are cows that cycle within 1 to 2 months after calving and others that do not cycle until 3 to 4 months after calving; these are no obvious visual differences between these two groups of cows. Some of my cows only peak at 5 L milk /day. What are the key management measures I need to closely follow? (*Dr Quazi Huque, Bangladesh*)
- Would you know what possible dietary problem will lead to cows or calves to continuously lick their mouth and lips or just the air? We have some animals like that, and I am thinking it might be related to some dietary deficiency. (*Dr Theresa Ursal, Philippines*)
- Why do cows “perch” as a symptom of rumen acidosis? (*Dr Theresa Ursal, Philippines*)
- How do you treat milk- fed calves suffering from bloat? The bloat is the ruminal type because it can be reduced using a trocar (a sharp knife) which punctures the rumen wall to ease the pressure. (*Dr Theresa Ursal, Philippines*)
- What is the ideal feeding frequency for milking cows? (*Ms Elizabeth Wina, Indonesia*)
- How do you monitor heat stress in milking cows? (*Dr Quazi Huque, Bangladesh*)
- What is the best way to ensure milking cows are provided with sufficient drinking water? (*Dr Quazi Huque, Bangladesh*)
- What are your recommendations to access a computer ration formulation program for milking cows? (*Dr Quazi Huque, Bangladesh*)
- I am advising a well managed milking buffalo farm where the buffaloes average lactation yield is 8 L. There are buffaloes in the farm that can produce up to 18L/day of milk. All are pure Murrah buffaloes. Their daily feeding ration is as follows:
 - Green fodder (Bajra Napier grass - CO4) - around 15 kg
 - Sorghum stover – 3 kg
 - Paddy straw – 5 kg
 - Concentrate – 2 to 4 kg (based on production)
 - Brewer's waste – 2 to 4 kg.

The dung consistency is soft with a dough like consistency. The buffaloes are allowed sufficient time in wallowing tank. The farmer sells milk @ \$0.75/lt. All animals are quite doing well with milk production.

But suddenly the fat content of milk has decreased from 8.5 to 7.5% from last month to this month. This affected the price of milk. I want to know, what might be the reason for this drop in milk fat content?

We are again we in the process of changing the composition of concentrate feed based on the knowledge what I obtained in this E-Learning course. But the course content contains information only for cows. Can you please suggest some references to formulate ration for buffaloes? (*Dr Akila Natarajan, India*)

Plans for future E-Learning programs

Clearly the participants are after a better interaction between themselves and the E-Learning Facilitator. One even suggested individual Skype sessions. Unless the Skype communication can be improved, another form on electronic communication needs to be sought. “Webinars” has been suggested as an alternative with specific questions typed out for all to see.

As the SDDP includes Myanmar and Thailand, additional programs are required in these two countries as a matter of urgency. There are still quite a few E-Conference participants who expressed interest in doing an E-Learning program.

This means that one or two E-Learning programs should be planned within the next six months. Apart from my presence at Virtual Classroom sessions, they can be facilitated by the Bangkok-based Dairy Asia staff. In addition, the Q & A Forum on the Dairy Asia website should be regularly used to provide answers to many of the Skype questions.

Appendix

Expectations from E-Learning program

1. *Name*
2. *Address/location*
3. *Email address*
4. *Position held (Government adviser, Staff of Milk processor, Private adviser)*
5. *In what topic was your post-secondary school/university training (veterinarian, animal science, dairy cow production, other)?*
6. *How many dairy farmers do you advise?*

For the following 3 questions, provide a range of numbers with a typical average figure

7. *What is their typical number of milking cows in each herd?*
8. *What is their typical area used for growing their own forages (in ha)?*
9. *What is their typical per cow milk production each day (in L/cow/day)*
10. *What specific topics would you like to learn about in this E-Learning program?*

Evaluation of E-Learning program

Participant's Name

1. **Expectations**

What were your expectations of the program? Please list:

2. **Outcome**

What knowledge have you gained from this program?

3. **Relevance of Training**

Please describe how this training will be of use to your work.

4. **Program Delivery**

Please tick the appropriate space to indicate your views on the way the program has been delivered.

Please tick	Not enough	About right	Too much
Overall program			
E-Modules 1 to 16			
Knowledge Assessment Tests			
Skype sessions			

5. **Other comments**

6. **Overall**

How do you rate this program?

	Excellent	Very good	Good	Not good
Please tick one				

7. What are the **weaknesses** of the program?

8. What **improvements** can be made for future programs?

9. List the **most important messages/information** that you found most useful to you.

10. List the **least useful messages/information** that you found least useful to you

11. When should you do a **refresher course**?