

R4F/FRG

Empowering Farmers' Innovation

FRG 
Project for Enhancing Development and Dissemination of
Agricultural Innovations through Farmer Research Groups (FRG II Project)
www.jica.go.jp/project/english/ethiopia/001/

Newsletter from FRG II "R4F/FRG" No.10 August 31, 2012

Basic FRG Approach Training at Adami Tulu Tesfaye Gemechu Adami Tulu Agricultural Research Centre

A training on Basic FRG Approach was carried out at Adami Tulu Agricultural Research Centre (ATARC) from February 27 to March 1, 2012 for researchers from research centres and universities in Oromia Region.



Participants during the training

The participants exchanged their experiences on FRG based research and other participatory research activities in the areas of cereals, agricultural machineries, honey bee, fishery, other livestock, and agro forestry. Research design, scientific credibility, and sustainability were the issues discussed and the importance of following standardised research design and creating a sense of ownership among participating farmers through cost sharing were reconfirmed. It was also stressed that research topics should be based on farmers' needs and interests.

The participants also visited members of sweet potato FRG at Aneno Shisho near ATARC. The farmers reported that the FRG introduced a new and important crop that was not cultivated before in their area and can potentially be a solution to their problems. The farmer also explained that working in a group was important not only in gaining individual benefit but also in building their social ties. FRG has brought farmers and researchers closer so that the farmers could gain knowledge and skill on sweet potato production and other interrelated issues.

After the field visit, the participants exercised proposal development in groups, based on which discussion was made on important elements in FRG activities. The training was closed by participants' pledge to use FRG approach in their future research activities and share with others the knowledge and experience they gained from the training.

For further information: Tesfaye Gemechu <gtesfaye3@gmail.com>

PD Method Training at Holetta

Firew Kassa Esho¹ and Taku Seo²

¹Holetta Agricultural Research Centre

²FRG II Project

On June 13th and 14th, 2012, Process Description (PD) Method Training was conducted at Holetta ARC with 28 researchers from different regions. Mr. Firew Kassa of Holetta ARC was a resource person and he introduced the participants to "what PD

method is" followed by how it can be used in daily research activities. PD method is a simple method to prepare manuals with pictorial description and can be applied when researchers convey technical information to extension and/or technical assistants (TAs). The participants also practiced effective photographing skills, which is critical to prepare self-explanatory technical information. The exercise gained through developing samples, all the participants are expected to develop their own PD manuals.

Rice Research Seminar in Bahir Dar

Dr Yoshimi Sokei

Special Advisor, Arid and Semi-Arid Farming Area Division,
Rural Development Department, JICA

Dr Sokei visited FRG II Project between May 30th and June 8th 2012 and conducted a rice research seminar at the Amhara Regional Agricultural Research Institute (ARARI) for 16 researchers from four research centres in the area. The seminar firstly discussed the principle of rice research including growth characteristics, varietal characteristics, seed and fertilizer calculation, seed production, trial treatment, data collection, significant figure, data comparison, data analysis, etc., then discussed practical issues identified from the reports, which the researchers submitted to the FRG II Project.

Despite having limited experience in rice, the participants were enthusiastic and surprisingly quick to absorb new information. Due to the diversity of technical training the researchers were provided by different international institutions and donors, patchy situation of the rice research in the country was prominent. Much of the present rice research is carried out in collaboration with CGIARs; many researchers are taught applied level methodology, which has narrowed down researchers' way of thinking. Without proper understanding of the principle of rice, the research may be conducted applying research methods based on the interest of the funding institutions. Such research methods are understood as standards by Ethiopian researchers, who then apply the methods to other researches.

A specific example to show the case is a research report containing CV (coefficient of variance) among more than 20 rice varieties. Each variety has different traits so it is quite normal to have larger CV values among different varieties. The researcher explained that the CVs were reported because the statistical software produced CV values each time. Computer software produces numbers regardless to the kind of data being fed into. It is therefore important that researchers have to understand well what each statistical output means.

Due to shortage of time, the participants did not understand well about setting parameters for variety selection, cultivation and fertiliser experiment, and trial designing for research objectives this time. It is necessary for researchers to go through practical training sessions combining research planning according to research purpose, field activities on trial plots, data collection and data analysis.

Common research method should be shared among Ethiopian rice researchers. In order to do so, not applied nor simplified but basics of rice research methods should be acquired by them. The Ethiopian researchers were observed as serious and motivated. Dr Sokei is sure that once they are equipped with the basics, the rice research in Ethiopia will develop rapidly.

Exchanging Experiences in Rural Development

Study visit to Japan

"Practical contribution of the research in rural development and good competitions among researchers and research stations were an important lesson to learn from the Japanese agricultural research system", claimed the researchers who participated in a 10-day study trip to Japan in July 2012. Mr Teha Mume of Oromia Agricultural Research Institute, Dr Girma Tegegn of Melkassa Research Centre, Dr Tadesse Desalegn of Bahir Dar University and Mr Hailay Mehari of Mekelle University visited Japan to exchange experiences in agricultural research and rural development with Japanese researchers. They visited Japan International Research Centre for Agricultural Science (JIRCAS), Tokyo University of Agriculture, Kyoto University and Nagoya University. They interacted with Japanese counterparts through seminars and field visits at each institute. They expect further collaboration between Ethiopian and Japanese research systems through various projects. A report of the study trip and papers presented at the seminars will be available from FRG II office soon.



Seminar at JIRCAS



Visit to a research station

FTC as a Platform for Technology Innovation

FRG at FTC

Farmer Training Centre (FTC) could be a place where researchers, Development Agents (DAs) and farmers work together to tackle priority needs of agricultural production in the community. FRG based trials conducted at FTCs (FRG@FTC) aim to investigate if FTC can be an efficient place to innovate. Responding to FRG II project's call for proposals, a large number of research teams applied and four proposals from Agricultural Research Centres of Assosa, Bako and Bonga, and Haramaya University were selected to implement FRG@FTC research projects. Fertilizer application for rice, field management of tef, soil conservation and tomato productions technologies are tested by each research team at FTC. These applied research activities are expected to indicate the efficient ways and approaches to create strong linkage between research and extension in addition to technology innovation that occurs at FTCs where many farmers frequently visit.

Improving Feed Management Technologies in Lowland Pastoralist area

Pastoralist/agro-pastoralist Research Group

Addressing food insecurity issues in arid areas of Ethiopia is one of the important areas of the agricultural research. FRG II project, in strong collaboration with the Livestock Research Directorate and Emerging Regions Coordination Office of EIAR, called research proposals on the theme of "Forage Improvement in Pastoral and Agro-pastoral Areas". Proposals submitted from Mekelle University, Fafen Integrated Livestock Research and Development Centre, Jinka Agricultural Research Centre and Yabello Pastoral and Dryland Agricultural Research Centre were selected for implementation. Research topics on forage varieties, forage seed production and rangeland forage management are currently implemented in collaboration with agro-pastoralists at each location. It is expected that research teams of the four research institutions will develop a participatory research guideline with pastoralists and agro-pastoralists as PRG/PAPRG approach.

FRG II Open Seminar

Reporting on rice production and cattle management training

Two researchers who have returned from training in Japan on rice production and cattle management presented their experiences on December 14 at EIAR. Mr Berhanu Arbissie of Tigray Agricultural Research Institute presented an overview of the experiment on planting density of irrigated rice which can be applied in the rice research underway in the Region. Mr Aemiro Kehaliew of Holetta Agricultural Research Centre introduced the contents of the training course on cattle management for meat and milk production along with the advanced cattle management technologies used by Japanese farmers. He also presented the extension materials developed during the training for silage making, artificial insemination, etc.

Learning from Uganda's Rice Development

Training programs at PRiDe in Uganda

Promotion of Rice Development Project (PRiDe), a JICA project in Uganda, has been a good partner of FRG II. PRiDe offers a number of training courses for African countries including Ethiopia. Recently, Ethiopian personnel from the research and extension attended two courses in October and November namely "Program Management on Rice Development" and "Rice Postharvest Management". The participants learnt well established linkages among research, extension and private sector in rice sector development and postharvest management. PRiDe is located within Uganda's National Crop Resources Research Institute at Namlonge and has various rice research and training facilities including fields of different rice growing stages for training.

Fogera Farmers on TV

FRG II covered by a Japanese TV program

Mr Berhane Abebe, a rice farmer in Fogera, met a Japanese TV celebrity Mr Ru Oshiba and talked about his rice cultivation. Mr Ru was in Ethiopia as a TV reporter to introduce Japan-Ethiopia cooperation. Mr Sawagegne of Adet Research Centre and Mr Seo of FRG II were also there to explain how research and extension activities were participatory. The TV program was on-air in Japan on November 9th, and it helped to publicise the project's activity to the people in Japan.



Mid-term Evaluation of FRG II Project

A mid-term evaluation of FRG II Project was carried out in August 2012. The evaluation team consisted of five experts including JICA staffs from its headquarters, a staff of the EIAR Planning Section, a consultant, and an academic staff of Haramaya University. The evaluation was carried out to review performance of the project and identify ways for successful implementation of the remaining project period. The review was conducted based on five criteria namely, relevance, effectiveness, efficiency, impact and sustainability. After interviewing project staffs, researchers, farmers and other relevant personnel and

visiting some FRG research sites, the team concluded that the project had been implemented as it was scheduled and would achieve its goal within the project period.



Mid-term evaluation team at FRG II Office, EIAR



Interviewing a FRG participating farmer (Bahir Dar)

National Rice Research and Training Centre

Designing work for National Rice Research and Training Centre (NRRTC) is underway since June 2012. NRRTC is planned to be established in the near future in Woleta District, Amhara Region to cater the development of rice production technologies and to train technical personnel for comprehensive rice development in Ethiopia. Rice has been promoted as a millennium crop of the country. The designing work is assisted by JICA and a master design of NRRTC is expected to be completed in January 2013.

OTHER INFORMATION RELATED TO THE PROJECT

- "Backing Rice Extension Rightly", proceedings of the seminar held in March 2012 is available at the project office and on the project web site.

Quick reference for Determination of milk fat



Firew Kassa, Rahel Nebiyu and Binyam Kassa
Ethiopian Institute of Agricultural Research (EIAR), Holetta Agricultural
Research Center

February, 2012

Contents

- Introduction
- Purpose
- Theory
- Procedure
- Expected Results
- References

Introduction

- Fat in milk exists in the form of an emulsion which is stabilized by phospholipids and proteins.
- Gerber method is one of the main tests used to determine the fat content of milk and milk products although automated methods for testing milk are now used in central laboratories and at large processing centers
- The method is important for milk quality inspecting laboratories to get accurate results of milk fat content

Purpose

- The purpose of this manual is:
 - To prepare simplified procedures that can easily be used as quick reference during milk fat test routines

Theory

- The theory of the Gerber method is based on the fact that
 - the fat globules are de-emulsified by the addition of concentrated sulphuric acid (H_2SO_4)
 - The separated free fat, with a lower density than the surrounding medium, may be separated rapidly by centrifugal force.
 - Addition of amyl alcohol gives a clearer dividing line on the Butyrometer scale between the fat layer and the other material

Materials required



Butyrometer



Butyrometer stoppers



Butyrometer racks



Gerber Centrifuge

 H_2SO_4 dispensersAmyl Alcohol
Dispensers

Water bath

90% H_2SO_4 

Conc. Amyl alcohol



Milk / product samples



Procedure



1. Mix the milk sample thoroughly and gently before pipetting
2. Pipette or dispense 10 ml of sulphuric acid into the Butyrometer
3. Pipette gently the required volume of milk into the Butyrometer
4. Pipette or dispense 1 ml of amyl alcohol
5. Clean the neck of the Butyrometer with tissue or dry cloth
6. Stopper the Butyrometer tightly using a clean, dry stopper.



Procedure



7. Shake and invert the Butyrometer several times until all the milk has been absorbed by the acid
8. Place the Butyrometer in a water bath at 65° C for 5 minutes
9. Centrifuge for 4 minutes at 1100 rpm
10. Return the Butyrometer to the water bath for 5 minutes and ensure the water level is high enough to heat the fat column and.
11. Read the fat percentage by bringing the graduation mark to eye level


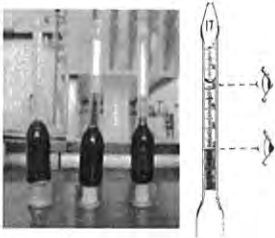
Remark: If necessary, the fat column can be adjusted by regulating the position of the stopper.

Photograph	Description	Remark
	<p>Mix the milk samples thoroughly taking care to minimize incorporation of air.</p>	<p>Allow the sample to stand for a few minutes to discharge any air bubbles and mix gently again before pipetting.</p>
	<p>Pipette or dispense 10 ml of sulphuric acid into the Butyrometer</p>	<p>Sulfuric acid is corrosive. Wear acid proof gloves and avoid body contacts</p>

Photograph	Description	Remark
	<p>Pipette 10 ml of milk into the Butyrometer</p>	<p>Care must be taken to avoid charring the milk, by ensuring that the milk flows gently down the inside of the Butyrometer.</p>
	<p>Pipette or dispense 1 ml of aml alcohol</p>	

Photograph	Description	Remark
	<p>Clean its neck with tissue or dry cloth and stopper the Butyrometer tightly using a clean, dry stopper</p>	
	<p>Shake and invert the Butyrometer several times until all the milk has been absorbed by the acid</p>	

Photograph	Description	Remark
	<p>Place the Butyrometer in a water bath at 65° C for 5 minutes</p>	
	<p>Centrifuge for 4 minutes at 1100 rpm</p>	

Photograph	Description	Remark
	<p>Return the butyroers in to water bath for 5 minutes</p>	<p>Make sure that the water level is high enough to heat the fat column.</p>
	<p>Read the fat percentage by bringing the graduation mark to eye level.</p>	<p>When necessary, the fat column can be adjusted by regulating the position of the stopper.</p>

Expected outcome

- Improve efficiency of fat content determination routine of the lab and get accurate results.

Reference

1. O'Connor, C.B., 1994. Rural dairy technology. ILRI training manual No.1. International livestock Center for Africa, Addis Ababa, Ethiopia. 133 pp

Quick reference for Determination of milk protein



Firew Kassa, Binyam Kassa and Rahel Nebiyu
Ethiopian Institute of Agricultural Research (EIAR), Holetta Agricultural
Research Center

February, 2012

Contents

- Introduction
- Purpose
- Theory
- Procedure
- Expected Results
- References

Introduction

- Proteins are highly important component of naturally occurring compounds essential to all life processes.
- The composition of protein in milk vary from species to species and Friesian cow's milk has on average 3.2% of protein content.
- Though the automated methods using digital techniques are available in most high scale dairy plants, formal titration remains the method of choice for protein determination of laboratory routines.

Purpose

- The purpose of this manual is:
 - To prepare simplified procedures that can easily be used as quick reference during laboratory routines of milk protein determination

Theory

- When formaldehyde is added to milk the free amino groups of the protein react with the carbonyl groups of formaldehyde
- This reaction cause the milk to become acidic
- The acidity developed is related to the amount of protein present
- This also may be measured by titrating with sodium hydroxide (NaOH) using phenolphthalein as indicator

Materials required



Glass beaker 30 – 50 ml



Burette 50 ml capacity



Pipettes 0.1 ml graduated



N/9 NaOH



40% formalin solution





0.5% phenolphthalein






Milk / product samples

Procedure

1. Place 10 ml of milk in a white porcelain basin
2. Add 0.4 ml of saturated aqueous potassium oxalate and 0.5 ml of 0.5% phenolphthalein solution
3. Allow to stand for 2 minutes and titrate with N/9 NaOH until a pink colour is obtained
4. Add 2 ml of neutral 40% formalin which will discharge the pink colour
5. Continue the titration with N/9 NaOH until a pink colour of equal intensity is again obtained
6. The number of ml of the N/9 NaOH used after the addition of the formalin multiplied by 1.74 gives the percentage protein in the milk

Photograph	Description	Remark
	Place 10 ml of milk in a white porcelain basin and	
	Add 0.4 ml of saturated aqueous potassium oxalate and 0.5 ml of 0.5% phenolphthalein solution	Allow to stand for 2 minutes

Photograph	Description	Remark
	<p>Titrate with N/9 NaOH until a pink colour is obtained</p>	
	<p>Add 2 ml of neutral 40% formalin which will discharge the pink colour</p>	

Photograph	Description	Remark
	<p>Continue the titration with N/9 NaOH until a pink colour of equal intensity is again obtained</p>	<p>The number of ml of the N/9 NaOH used after the addition of the formalin multiplied by 1.74 gives the percentage protein in the milk</p>

Expected outcome

- Improve efficiency of protein content determination routine of the laboratory and get accurate results

Reference

- O'Connor, C.B., 1994. Rural dairy technology. ILRI training manual No.1. International livestock Center for Africa, Addis Ababa, Ethiopia. 133 pp

**Interim report on the training
course of principles and practices of
cattle management using regional
resources**

By Firew Kassa Esho

Submitted to JICA Obihiro,

December 2011,

Obihiro, Japan

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Acknowledgement

I would like to express my heartfelt appreciation to Japan International cooperation Agency (JICA) for organizing this productive training program and providing me all financial support and opportunity. In addition I would like to thank Obihiro University of Agriculture and Veterinary Medicine, Obihiro International Center (OBIC), Hokkaido International Exchange and Cooperation Center (HIECC), Japan International Cooperation Center (JICE) and their staffs for giving me this unreserved care and guidance to make this training real.

My appreciation special thanks also go to the course leader Associate Professor Masaaki HANADA (PhD) for his thoughtfulness to teaching, helping and encouraging us during all the time of training course. I also want to thank all the professors involved in this course for their kindness to spend their precious time preparing these highly useful lectures and guidance for us in the study work.

I would also like to express my gratitude to Ms. Maki Ishiwata Mr Kinoshita and Mr Hironori Kato for their help and concern for us from beginning of the course until the end. My special thanks also go to the staffs of JICA, OBIC, HIECC, JICE and their supporters who made us to have pleasant time in Japan.

The last but never the least, I would like to express my thanks and appreciation to my classmate colleagues (Abbas, Azad, Musa, Mohammed, Sundui, Tan, Wahid and Wendell) from different countries in the world that were always sharing the knowledge and experience with me and each other and made our stay successful.

Introduction

The international training course entitled as “Principles and Practices of Cattle Management for Meat and Milk Productions Using Regional Resources” is organized by Japanese International Cooperation Agency (JICA) and led by Obihiro University of Agriculture and Veterinary medicine. Participants from nine different countries in the world participated in the training program. The main purpose of the training course was to strengthen the development efforts of the livestock sectors in each country through improving technical proficiency of the participants and sharing improved techniques of livestock sciences in Japan. Thus, the program created excellent experience sharing opportunities that can be used for development efforts of cattle management for milk and meat production among participants from different countries. By doing so, JICA would support the development efforts of each country in livestock sector for the improvement of cattle production system in their region and improvement of living conditions of the public. The training program has started on 23rd October and finalized on 23rd of the December.

Review of the courses covered

Reproduction

Reproduction management is one of the most important tools to improve productivity and profitability of farms. In developing countries including Ethiopia, the status of reproductive management of cattle and other domestic animals is not strengthened in the level it should be. The situation is attributed to various reasons including shortage of trained man power and facilities as well as the low level of farmers’ awareness about the benefits of reproductive management. This type of training for mid level professionals therefore could help the trainees to contribute to their countries for the improvement of the awareness of cattle farmers through dissemination of easily understandable packages of knowledge and practices they acquired during their stay in Japan.

The objective of this course module was to enable the participants to explain about the reproduction management and support cattle farmers to benefit from their farms using proper reproduction management techniques.

Therefore, the course covered lectures on Artificial Insemination (AI) techniques in cattle, Estrus detection, Timing of Insemination, Handling of Semen, detection of standing estrus in cattle, Embryo transfer, Estrus behavior, Ovarian function, Pregnancy diagnosis,

Reproductive disorder and Reproductive management among others. In addition to this, the trainees got practical demonstration sessions for pregnancy diagnosis using ultrasonography by specialist professors and visited embryo transfer center. Moreover, the participants got the chance to practice technique for preparation of tail paints and using scales for estimation of optimum timing for artificial insemination which are highly important components of this course module.

Feed resources

Each country of the training participants is endowed with different agro ecologies and production systems. Thus, they have feed resources that can supply for the improvement of cattle in each country. Yet, poor management and utilization of feed results in shortage in feed scarce season and spoilage and loss in seasons where high feed resources are available. Cattle production is the integral part of agricultural systems in all countries including Ethiopia. Having highest cattle population in Africa, Ethiopia is one of the large number cattle owning countries in the world. Yet the country stands at one of the lowest productivity stage in the dairy and beef production. Among other factors, feed shortage and lack of knowledge to preserve available feed resources are the major factors contributing for the lowest productivity of the cattle sector in the country. As the course was focused on utilization of various crop and industrial byproducts in each country, it has high benefit to improve feed resources and utilization in Ethiopia.

Main topics covered in this course include feeding management of dairy cows, silage making using various byproducts, silage making using tropical grasses, FJLB preparation and utilization, and different experimental methods to evaluate quality of silage feeds among others.

Beef production

Although Ethiopia owns the largest number of cattle in Africa, the production and consumption of beef is low as compared to other countries. Reports indicate that the per capita consumption of beef in Ethiopia accounts only 8kg. There are specialized dairy farms in urban and peri-urban parts of the country. The calves and old dairy cows are not being utilized well and the benefits of the farms are below the levels they should be. This training will contribute for the improvement of this condition in the country.

Nutrition of dairy cows




Dairy cows should be feed with proper level of feed in order to make full use of their productivity. Proper feeding management not only helps to increase the productivity of dairy animals but also to protect cattle from diseases that could be resulted from disorder of energy balances. Therefore, feeding the dairy cattle should consider requirement for maintenance and requirements for production. The course properly indicated these conditions and highlighted possible health problems that could result from failing to follow proper feeding of dairy cattle and possible management interventions.





Milk hygiene





Production of good quality milk and getting profitable supplying it to the consumers is the ultimate objective of dairy farmers. To attain the objective, farmers need to follow proper hygienic measures during production and handling of milk. As milk is highly nutritious food of animal origin, it is highly susceptible for the spoilage by different contaminants including various spoilage bacteria. One the bacteria get access to the milk, it can easily multiply and spoil the quality of milk as well as make it unsafe for human consumption and unfit for further processing. Thus, the farmer cannot sell milk produced from his farm and losses the profitability of the farms. In addition, unhygienic milk production can result in infection of mammary glands of dairy cattle and further expense and reduced profitability of the farms. This training therefore, contributes to improve this kind of conditions in each country.

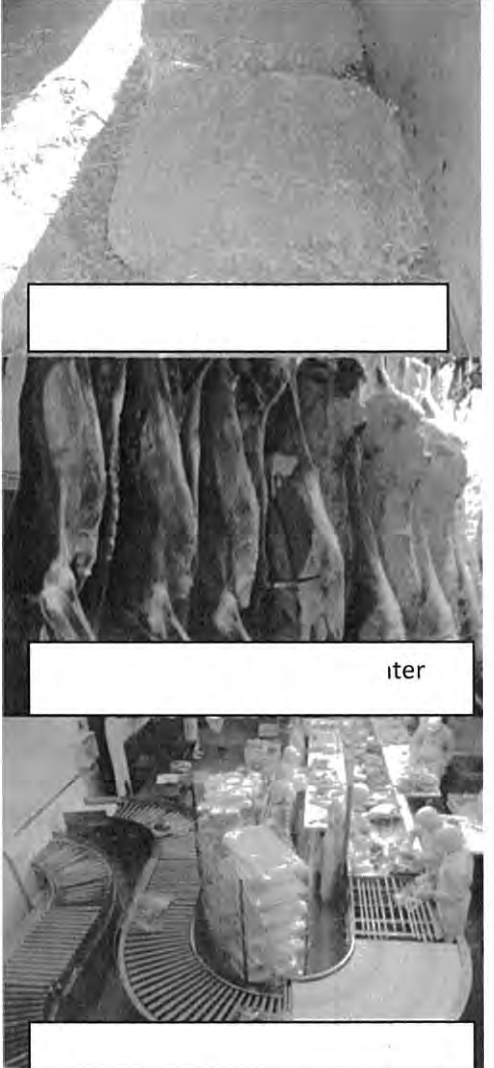
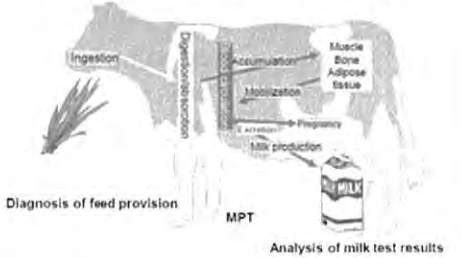
Summary of course review





Contents	Pictures
<p style="text-align: center;">Reproduction</p> <p>Lectures the following lectures and practices</p> <ol style="list-style-type: none"> i. AI techniques in cattle. Under this title, we learned the most important aspects during insemination. ii. Important points in AI, here we learned about estrus detection, timing of insemination, handling of semen, and insemination techniques. iii. Estrus behavior relationship between time and estrus behavior, benefits of regular monitoring of farms, use of tail paints for estrous detection. iv. Embryo transfer Advantage of ET, Super ovulation, follicular wave occurrence, Improvement of response for hormonal treatment, growth of bovine embryo, embryo collection, evaluation of embryos, and synchronization of estrus between donor and recipient cows among others. v. Ovarian function class included morphological changes in bovine ovary during estrus cycle, follicular development during estrus cycle in cattle, endocrinology and follicle development, ovulation and corpus luteum formation, roles of progesterone, regulation of dominant follicle development, etc. vi. Reproductive disorder lecture covered analysis of reproductive record, delayed ovulation, ovarian quiescence, ovarian cyst, persistent corpus luteum, silent heat, early embryonic death, pregnancy loss, urovagina including symptoms, causes and treatments for each. vii. Reproductive management focused on the issues such as importance, lactation curve, long calving interval and its effect, targets of days for first AI after parturition, indexes for evaluating reproductive performances in the herd, important points in reproductive management, strategy for improvement of reproductive performance, evaluation of changes in conception rate, evaluation of reproductive performance using pregnancy rate and periodic examination of reproduction. 	  


Contents	Pictures
<p>Practical sessions</p> <ol style="list-style-type: none"> i. Use of scales for optimum timing of AI ii. Preparation of paints for tail painting to detect standing heat iii. Embryo harvesting and transferring techniques <p>Site visits</p> <ol style="list-style-type: none"> i. We got chance to visit one of NOH Embryo transfer centers in Japan. ii. We have also visited beef farms using dairy cows as recipient and beef embryos from ET center. <p>Important techniques, information and concepts</p> <ol style="list-style-type: none"> a. The concept of reproduction management is very important and the central part of the module. So I got a very good insight about reproduction management and I will apply my knowledge using different techniques in my country. JICA and the professors deserve great appreciation for what they did. b. The information and practical knowledge I got about embryo transfer is highly important and useful for my future contribution in my country. c. I learned simple but highly effective and useful techniques such as using (making) scale for optimum timing of AI and the method of preparing tail paints and using paints for estrus detection. 	 
<p>Feeding</p> <p>Lectures</p> <ol style="list-style-type: none"> i. Classification of agricultural byproducts under which we learned about field residues and fibrous byproducts as well as processing residues such as carbohydrate rich residues and protein rich residues. ii. Feeding dairy cattle using byproducts under this lecture we have learned about use of different byproducts such as crop residues, fruit and vegetable byproducts, and other industrial byproducts found in our countries. iii. Feed evaluation and feed intake lecture has covered the nutrient contents of various feed staffs and highlighted feeding animals based on their requirements. To improve nutritive value, various 	

Contents	Pictures
<p>methods can be used such as urea treatment and mixing with high nitrogen feeds.</p> <p>iv. Factors affecting feed intake were mentioned in this part and correction options which are related with animal and environment/feed are also highlighted. Improving digestibility and enhancing rumen activity among the useful options indicated.</p> <p>v. Principles of Silage making was one of the important topics we learned. In this topic, the importance of silage making and principles involved are highlighted. After lecture hours and time were also allocated for practicing silage preparation using different byproducts.</p> <p>vi. Tropical pasture establishment and utilization lecture was given by the professor in Ryukyus University and included important aspects of pasture production and utilization in tropics. This part also included effective silage making, adaptation to agricultural byproducts in silage making, sustainable pasture production in tropics and sub tropics.</p>	 
<p>Practical sessions</p> <p>i. Evaluation of silage quality: during this practical, we learned how to evaluate good quality silage by measuring its pH and by touching, smelling and observing. Good quality silage has pH less than 4.5, good color, slightly acidic and normal upon touching.</p> <p>ii. Silage making using vegetable byproducts: this practical is highly useful to utilize fruits and vegetable byproducts in my country which are usually abandoned without any use.</p> <p>iii. Experimental silage making: was also one of useful techniques we practiced. It helps to evaluate silage quality in small amount before applying in large scale. It is useful technique for extension workers and researchers.</p> <p>iv. Preparation of FJLB was one of the most important practical sessions we had. FJLB can be used to make good quality silage using grasses with low sugar contents and high buffering capacity.</p>	 

Contents	Pictures
<p>Site visits</p> <ul style="list-style-type: none"> i. We have visit potato starch factory and learned how they make good quality potato pulp silage for dairy cattle feeding. ii. We have also visit sugar beet factory and learned the factory makes silage using sugar beet top for cattle feeding. iii. During field visit in Okinawa, we have learned beef farms feeding grass silage and pineapple byproducts silage for their cattle. iv. We have also visited dairy farm using grass silage and different byproducts in for their cattle Okinawa. 	 <p style="text-align: right;">on</p>  <p style="text-align: right;">FJLB before fermenting</p> <p style="text-align: right;">anted</p>
<p style="text-align: center;">Beef production</p> <p>Lectures</p> <ul style="list-style-type: none"> i. Beef production under this topic, we learned about factors affecting meat productivity in beef, production and consumption of animal products in Japan, livestock population and beef supply in Japan among others. ii. Principles of animal growth in this part we learned about growth curve and change of body shape with age, growth order in tissue and parts, genetic growth potential and nutritional status, factors affecting carcass yield and quality of meat producing animals such as genetic potential, feed and other environmental factors. iii. Meat performance, carcass yield and quality lecture covered body composition of finishing steers, carcass grading points, intramuscular fat % and marbling scores, structures of skeletal muscles and marbling in beef, manipulation of growth and meat quality, beef cattle feeding for meet quality 	 

Contents	Pictures
<p>including vitamin supplementation.</p> <p>iv. Meat production from dairy herd was one of the lectures we learned about points such as conversion of nutrients from feed to animal tissue, beef production system in Japan, cost and gain of beef production in Japan, trend of formula feed price, life span in dairy male calf, feeding for weaning and growing, compensatory growth.</p> <p>v. Meat production lecture also covered chemical composition of feed and muscles, feed additives for improvement of meat quality in beef, meat color and myoglobin, quality grade and beef color standards, vitamin supplementation and meat color maintenance, test elements in meat and production diseases among others.</p> <p>vi. Beef production by feeding agricultural byproducts under this part, we learned about energy compartment in feed, feeding for meat yield, chemical composition and taste elements in meat, feed recycling and global warming,</p> <p>Practical sessions</p> <p>We have visited two beef farms one dairy beef and the other was Japanese black beef cattle far. We also visited Obihiro abattoir which is the 2nd largest in Japan next to the biggest in Tokyo.</p>	
<p style="text-align: center;">Nutrition of dairy cow</p> <p>Lectures</p> <p>i. Theory and practice of metabolic profile test (MPT): this lecture involved MPT and individual treatment, nutrient metabolism in dairy cattle, production diseases, MPT diagnostic criteria, microbial protein synthesis in rumen, protein, energy and mineral</p>	<p style="text-align: center;">Nutrient metabolism in dairy cattle</p> 

Contents	Pictures
<p>status indexes and points to consider when interpreting MPT diagnostic parameters.</p> <p>ii. Use of body condition scoring (BCS): covered concepts of BCS, meaning of BCS change, History of BCS, criteria of BCS, use of BCS, check points in BCS, relationship of BCS and milk yield and BCS and parity.</p> <p>iii. Feed allocation: we learned in this lecture, nutrient traits of feed and rumen fermentation, BUN concentration of cows, nutrient composition of the feed, milk production, nutrient traits of some feed stuffs and combination of forage and concentrate.</p> <p>iv. Lectures also were given on identification of metabolic disorders by MPT such as subclinical ketosis, hypoglycemia and mycotoxicosis.</p> <p>Practical sessions</p> <p>i. We conducted body condition scoring for the dairy herd of the university</p> <p>ii. We have testing the quality of grass and corn silages</p> <p>iii. Observation of different crop and industrial byproducts types used as feed in Japan</p> <p>Important techniques, information and concepts</p> <p>i. Visual observation and smelling are among simple techniques to check feed quality</p> <p>ii. Using proper feeding management to dairy cows, it is possible to increase the productivity and prevent reproductive and other health disorders.</p>	<p>Healthy state : stable metabolism</p> <p>Nutritional input = Productive output</p>  <p>Blood parameters within normal range</p>  
<p>Milk hygiene</p> <p>Lectures we took under milk hygiene module</p> <p>i. Lactation physiology and mastitis control, improvement of milk components, milking and its physiology.</p> <p>ii. Post harvest milk handling and hygiene</p> <p>Practical sessions</p> <p>i. Milking using machines</p> <p>ii. Milk quality analysis using microbiological test (Total aerobic count, coliform count and</p>	

Contents	Pictures
<p>staphylococcus aureus count)</p> <p>iii. Milk quality test using alcohol (alcohol test)</p> <p>Site visits we visited</p> <p>i. Milk processing factory of the university</p> <p>ii. Maiji cheese factory</p> <p>iii. Tokachi cooperatives milk laboratory</p> <p>Important techniques, information and concepts</p> <p>i. Hygienic milk production</p> <p>ii. Milk quality analysis.</p>	 <p data-bbox="1023 801 1481 853">jiner</p>

Manual by PD Method

Obihoro International Center, Japan International Cooperation Agency

Definition of Process Description (PD) Method

PD method is defined to be a technology transfer method of producing both an operation manual and (audio) visual aids using photos or illustrations that are portrayed by superposing on the photos, of a series of actual activities of a work. The word of "PD" comes from abbreviation of "Process Description." The original meaning cannot, however, wholly indicate the true function of this method because application of this method is so diversified that not only the process but also other usages found, for instance describing degree of quality. Therefore, this method is called as the original name of "PD method." The manual by PD method consists of two parts, explanatory part and pictorial part.

Explanatory Part

Introduction / Preface

Purpose

Theory

Apparatus / Equipment

Procedure

Result / Data

References



Book: Author, Year, Title, Place, Publishers, Page

Internet: Author, Year, HP address, Date accessed

Pictorial Part

Pictorial Part consists of photo, description and remarks as follows;

Pictorial Part

photo	Description	Remarks
	Putting the sample soil to the sieves starting from #75mm to #20mm	
	Shake the sieves	To separate the sizes of the sample soil

Advantages of Manual by PD Method

- # “Manual” and “Power Point” for technical transfer and teaching are produced
- # Easy to make
- # Easy to read
- # Easy to revise
- # Easy to copy
- # Easy to use
- # Inexpensive
- # Many usages

Use Manual in many ways

- # Your reference
- # Circulate the manual in your organization
- # Handout to technicians, students and farmers
- # Training / Lecture / Workshop – Power Point
- # Examination and more

Work on Explanatory Part

- # Collect and read textbooks, references and information on Web
- # Photocopy useful pages
- # Clip useful sentences from the paper
- # Arrange the pieces of paper in order and paste them on a paper
- # Rewrite the sentences with your words
- # Never forget to write references

Work on Pictorial Part



Work in Group

Three in one group



Change roles to learn equally

Role of three

photo	Description	Remarks
	Putting the sample soil to the sieves starting from #75mm to #2mm	
	Shake the sieves	To separate the sizes of the sample soil

Photographer

Writer

Suitable Practice / Test for Manual by PD method

- # Easy to understand by pictures
 - (Example)
 - Operation manual for machine
 - Evaluation of growing crop
 - Production process of dairy product

- Procedure of planting

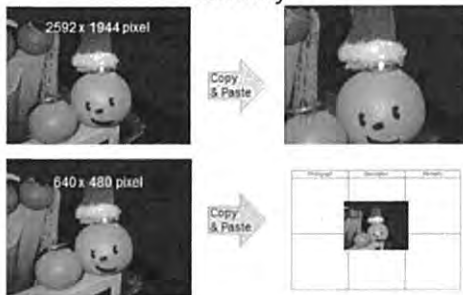
Unsuitable Practice / Test for Manual by PD method

Difficult to take photos, Dangerous operation, Experimental error might be occur due to simple explanation, Defined details of procedure by law

- (Example)
- Rectal palpation
 - Subtle change of color in test tube
 - Theory

Tips for taking pictures

Tip on Photography (1) Quality



Tip on Photography (2) Camera Position

Photograph	Description	Remarks

Tip on Photography (3) Subject



Tip on Photography (4) Angle



Tip on Photography (5)
Flash Light



Tip on Photography (6)
Back



The manuals we made in the training program include:

- i. Measuring pH of silage
- ii. Experimental silage making method
- iii. Method of FJLB preparation
- iv. Method of preparing paints for tail painting
- v. Preparation and use of simple scale for proper AI timing
- vi. Practices of good quality milking

These manuals are attached with document in power point format and available in hard and soft copies.

Action plan

Dissemination of the techniques

In my stay in Japan I have got many useful techniques that can be applied and used for the improvement of cattle production and productivity in Ethiopia. Some of the techniques we learned include, feeding management; making silage using regionally available products and byproducts, conducting quality test for silage produced using simple techniques such as sensorial evaluation and pH test. Preparation of fermented juice of epiphytic lactic acid bacteria was also one of the most useful techniques we learned to enhance silage making using different grasses. Under reproduction management, we have learned several useful pieces of information and practiced about detection of heat using simple techniques such as tail painting, estimation of proper time for AI so as to improve conception rate in the farm. Keeping hygienic condition of milking environment for production of good quality milk and mastitis prevention was important course component covered. We also learned useful steps in milking during this time. Finally we practiced about milk quality evaluation techniques using alcohol test and microbiological evaluation. Therefore I will try to disseminate these techniques using appropriate dissemination techniques.

Activity plan	Implementation schedule (2012)					
	Jan	Feb	Mar	April	May	June
<p>Activity: Giving seminar about the course and my experience in Japan Target group: Staff of my office Titles to be covered:</p> <ul style="list-style-type: none"> • Feeding management • Reproduction management • Beef production using dairy calves and old cows • Milk hygiene 	x	x	x			
<p>Activity: Giving lectures and trainings Target groups: Farmers around Holetta research center and mandate zones in the central Ethiopia. Titles to be covered: management of dairy and beef cattle</p> <ul style="list-style-type: none"> • Feed management • Reproduction management • Beef production 				x	x	x

Activity plan	Implementation schedule (2012)					
	Jan	Feb	Mar	April	May	June
<ul style="list-style-type: none"> Milk hygiene Responsibility: Researchers working in dairy nutrition, cattle breeding, dairy beef and milk quality research activities will take part to implement training activities.						

Manual making with PD method

Process description (PD) method is a technique used for making manuals including pictorial elastration and simple explanation. The method is highly useful and effective for application of useful knowledge in a simple and understandable way for the target users. Using this method, we have developed six manuals under different courses in our stay in Japan. Hence, we have good experience of the method and after returning to my country, I will prepare additional eight manuals that can be easily used by all level users including farmers, extension workers and laboratory workers. The manuals can be grouped into three categories such as feeding management (manual for silage making using fodder beet top and tropical grass), milk quality (manuals for chemical and microbial analysis of milk) and metabolic profile test (manuals for milk fat and body condition scoring).

The reason I select these methods is to enable as many used as possible easily understand and use these manuals on their day to day cattle management activities.

Activity plan	Implementation schedule (2012)					
	Jan	Feb	Mar	April	May	June
Activity: Preparation of manual that can be used in dairy laboratories for chemical quality analysis of milk Target groups: milk laboratory workers, farmers and milk collectors Titles of manuals: <ul style="list-style-type: none"> Determination of fat content in milk Determination of protein content in milk Evaluation of milk quality by alcohol test 	x	x	x			
Activity: Preparation of manual that can be used in dairy laboratories for microbial quality analysis of milk Target groups: milk laboratory workers, farmers and milk collectors		x	x	x		

Activity plan	Implementation schedule (2012)					
	Jan	Feb	Mar	April	May	June
Titles of manuals: <ul style="list-style-type: none"> • Identification of total aerobic bacteria in milk • Enumeration of staphylococcus bacteria in milk • Mastitis detection using simple methods 						
Activity: Preparation of manual for silage making using fodder beet root and top Target group: cattle farmers in highlands of Ethiopia Responsible: Forage research group and me				x	x	
Activity: Preparing manual on body condition scoring crossbred dairy cows in Ethiopia Target group: cattle farmers in Ethiopia						x

Manual application

The manuals will be applied for the improvement of cattle production and productivity in Ethiopia. The laboratory I am working in will use the manuals for milk quality analysis and farmers' cooperatives milk collection centers also will be benefited by using manuals for silage making, body condition scoring and other manuals we developed during our stays here.

**Interim report on
Cattle Management for Milk and Meat
Production Using Regional Resources**



Aemiro Kehaliew

Ethiopian Institute of Agricultural Research

Ethiopia

Nov 2013

Interim report on Cattle Management for Milk and Meat Production Using Regional Resources

Introduction

During our stay for the last two months we have learned the different aspects of cattle management for milk and meat production using the regional resources. Both theoretical and practical trainings were given. From the training program we have gained a lot of knowledge and skills. This skill and knowledge will help us to prepare appropriate training manuals for dissemination of technologies and knowledge to the smallholder farmers in Ethiopia. Some of modules that we have taken such as Principle of silage making and reproductive physiology are directly related to our tropical situation. They can be directly applied. Others are also very important and they will be applied with little modification based on the available resources and the environmental condition of each country. We have visited a large number of dairy and beef farms, processing factories, ranches and cooperatives. These have broadened our experience in the respective fields. The other important thing we have captured was value addition in the areas of milk, meat and compost processing and marketing. Value addition has big contribution towards improving income and job creation.

1. What have we learned from the training program?

1.1. In the beginning of the training we have taken lectures on Japans economy, education, poletics, and language course

- A well educated and hard working people
- Advance equipment and technology
- Free trade system
- Common goal between enterprises and labor union
- Tendency to save money

- National commitment to peace
- We are able to introduce ourselves in Japanese language

We have taken theoretical and practical training on process description (PD) method for manual preparation.

1.2. Reproductive physiology

Why reproduction is important in dairy cows? It has a great impact on productivity of the heard. It is important to reduce the effect of long calving interval.

Important points to be considered in reproductive physiology

- Rate of successful estrus detection
- Conception rate
- Pregnancy diagnosis
- Efficient AI
- Embryo transfer



Symptoms of estrus



tail painting to observe estrus

1.3. Principle of silage making

Silage making is conservation of crop at optimum stage of growth for use during the season when forage crop is unavailable. Silage is one important source of water for animals in dry period and in arid regions

- Silage preservation process
- Important characteristics for high quality silage
- Sources of loss in silage
- Silage additives

- Type of silo

We have also obtained enough information on the characteristics of high quality silage such as presence of water soluble carbohydrate, buffering capacity, moisture content and physical structure.



Silage machining using circular plastic bag

silage making using packet

silage making using horizontal plastic bag

1.4. Tropical pasture production and utilization

we have got both theoretical and practical training on method of selection of species , classification of different tropical forages, FJLB making, global environmental issues (green house effect), and nutrient loading from animal waste.



FJLB before and after fermentation

silage making by plastic bag

1.5. Nutrition and feeding management of cattle under tropical condition

From the lecture we have gained knowledge on characterization of the nutrient content of tropical grasses and the impact of heat stress on feed intake and productivity of livestock. We have also lectured on alleviation of heat stress by nutrition, energy metabolism and protein

nutrition. We have been also obtained practical experience on sausage making from beef and mutton.

We have visited Noborikawa dairy farm. In this farm we also observed manure handling and compost preparation and packing. Oppa Dairy products private limited campany was visted. Knowledge shared on value addition on milk (15 different flavored ice cream, milk with coffee, Yirghot and fat corrected milk).

Churaumi Aquarium was visited and a lot of experience obtained on how different aquatic animals live together. We have also visited Hirayama beef farm and we saw how to use pineapple residue as a feed for beef cattle. It is a very good source of energy and water.



Dairy farm

value addition on manure

aquarium for fish

Pineapple residue

1.6. Nutrition of Milking Cows

In this course we had obtained knowledge on development of feeding standard and feed data base, on energy and nutrition metabolism, estimation and suppression of methane, digestibility and rumen fermentation characteristics of feeds at different level of provision. We have done weighing of the sheep, harnessing and calculating the dry matter intake based on TDN requirement.

We have also observed experience on experiment on monitoring of rumen pH by wireless pH sensor in the rumen for evaluation of the effect of induced sub acute ruminal acidosis on milk fat content.



Digestion trial on sheep



machine for detecting methane concentration

1.7. Evaluation of meat quality

In this course we had a lecture on composition and structure of muscle, postmortem changes during conversion of muscle to meat, effect of rigor mortis on meat tenderness, mechanisms for cold shortening and prevention. We also visited beef farms and processing factories which showed as the importance of value addition.



Beef farm



meat processing



meat packaging

1.8. Animal disease and disease prevention of dairy cows

We have got explanation on prenatal diseases of dairy cows and their management. Descriptive explanation was given on the causes, symptoms, prevention and control to be taken for the prenatal diseases such as milk fever, downy syndrome, uterine torsion, prolapsed uterus, placental retention.

1.9. Hygiene of animal house

The explanation included the major points such as spreading materials, structure of cow bedding, stall safety, feeder structure and effect of heat stress and there correction mechanism.

1.10. Lactation physiology and mastitis control

Explanation was made on current status of dairy cows in Japan, mastitis inspection on farm, detection and prevention of mastitis, milk somatic cell count, PL tester reagent, milk quality test.

1.11. Hygienic management and examination of milk

In this course we have got information and experience on milk quality (bacteria count), milk quality control, milk collection management (milk collection system, quality tests, milk payment system, education/training), Cleaning of milking equipments. Brief explanation was also given on field methods to assess freshness and hygienic quality of milk (sensory test, clot-boiling test, alcohol test). We were demonstrated and practiced milking of dairy cattle.

We have practiced how to determine freshness of milk using alcohol and clot-on- boiling test. We have also visited milk testing laboratory of Tokachi Federation of Agricultural cooperative (milk composition test, somatic cell count and bacteriological examination).



Milk quality evaluation (bacterial count)

1.12. Metabolic Profile Test (MPT)

In this course explanation was made on nutrient metabolism in dairy cattle, MPT diagnostic criteria and the remedies to be taken.

1.13. Beef Production

In this course we learned about meat production, beef production system, beef cattle in Japan, carcass yield and quality, carcass grading and feeding for meat production.



Meat grading by marbling



Meat grading by color



Fat grading by color

We have visited two cheese processing factories. These factories are processing different kind of cheeses.

1.14. **Agricultural Extension Service in Hokkaido**

Discussion was mad on the following points.

- Organization of agricultural extension centers
- Extension guidelines and principles
- Role of extension officer

We have visited potato starch factory and Tokachi federation of agricultural cooperative association. Explanation was given on useful microorganisms, soil and feed analysis. We have also visited the laboratory.

2. List of PD manuals Made

1. Silage preparation from corn plant
2. FJLB preparation form forges
3. Tail painting
4. Time scale for AI

Action plan on

How to disseminate the knowledge and skills, the kind of manuals to be made and other experiences obtained during the training on cattle management for milk and meat production using regional resources

During our stay in JICA, Obic for the last two months we have gained skills and knowledge that is important to take back to our home. For dissemination of the technology to our area we are required to develop an action plan on way of dissemination, type of manual to be prepared and translated.

The action plan has three components

1. skills and knowledge dissemination mechanism
2. manual to be prepared
3. Other activities

A. The skills and knowledge's will be disseminated through the following ways

Activity	Source of fund	Tentative date of implementation	Implementer
Presentation to researchers	EIAR	January 2013	Dairy Research team
Training agricultural experts and development agents	EIAR/JICA	February 2013	Dairy Research team
Manual will be translated to local language	EIAR	March 2013	Dairy Research team
Training will be provided to smallholder farmers	JICA	April 2013	Dairy Research team
Report to EIAR/JICA		May 2013	Aemiro

B. The kind of manual that I am planning to make in relation to cattle management are:

PD manuals to be prepared	Source of fund	Tentative date of implementation	Implementer
Silage making from crop residue and processing by products	EIAR/JICA	March 2013	Dairy Research team
Urea-Molasses treatment of crop residue	EIAR/JICA	April 2013	Dairy Research team
Multi nutrient block	EIAR/JICA	April 2013	Dairy Research team

C. Apart from the manual activity, the other activity that I am going to work out are the following

Other activities	Source of fund	Tentative date of implementation	Implementer
Seminar at national level	EIAR	April 2013	Dairy Research team
Evaluation of the fermentation characteristics of food processing byproducts	JICA/EIAR	2013-2014	Dairy Research team
Evaluation of the feeding value of food processing by products	JICA/EIAR	2013-2014	Dairy Research team
Evaluation of the fermentation characteristics of crop residue with leguminous forage	JICA/EIAR	2013-2014	Dairy Research team

Acknowledgement

I would like to acknowledge JICA for it has given me the chance to participate in this training program. My great appreciate goes to Dr. Hanada, Mrs. Maki and Mr. Kato for arranging , coordinating and leading a well-organized training program. I would like also to thank Obihiro University lecturers for their un-reserved effort to equip us with skill and knowledge. Finally I extend my appreciation to the participants with whom I had a memorable stay here at Obihiro.



Cattle Management for Milk and Meat Production Using Regional Resources

Interim report
and
Action plan

Tarekegn, Kidanie Dessalegn

JICA-OBIC (Obihiro), Hokkaido
Japan

September 24 – November 23, 2012

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Introduction

A training program on “cattle management for milk and meat production using regional resources” was organized by Japan International Cooperation Agency (JICA) for nine participants of five developing countries for a period of two months. During this period lectures, practical demonstrations and site visits were conducted to make the training more valuable. Obihiro University was the host institute for the major courses of the training. This training program has aimed the development of leading professionals in livestock production in developing countries.

A. What has been learned in this training course so far?

The main topic of the training program/course is composed of lectures, practical sessions and site visits. Before the beginning of the main training course, general issues in Japan like Japanese language class, the insight of Japan administration, education and economy were explained and discussed to us by respective scholars. Besides these, other activities like school visits, Japanese family visit, Japanese culture sharing and the like were also included along with the main training courses. Brief description of the main training course is indicated here under.

1. Process description (PD) manual preparation

Different approaches can be followed in transferring the knowledge and skills of a certain technology to producers or other related stakeholders. However, methods which are simple and cheap are preferred for their better dissemination and easy utilization advantages. Process description (PD) manuals are simplified guidebooks that have brief description and procedure of a certain activity. Procedures are described with both texts

and pictorial representation for simplicity and clarity. PD manual are simple to prepare, easy to use and cheap to produce.

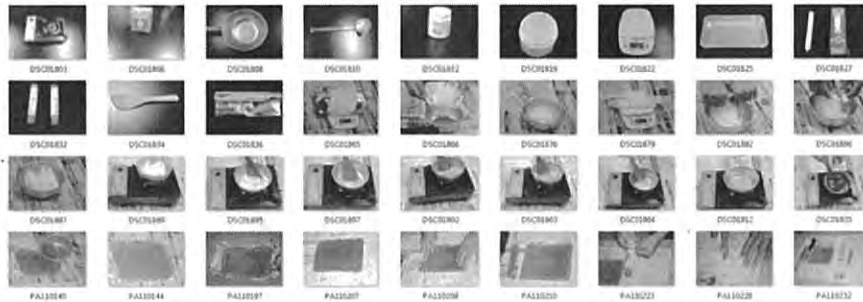


Fig 1. Series of pictures taken for PD manual preparation

Some of the basic concepts in PD manual preparation include:

- Procedures are described in texts and pictorial representation
- Representative pictures are key points to be considered during taking the picture of the procedures.
- Appropriate size, angle and background of the pictures should be given due attention.
- Font size and visible colours should be selected in the descriptive section of the manual.

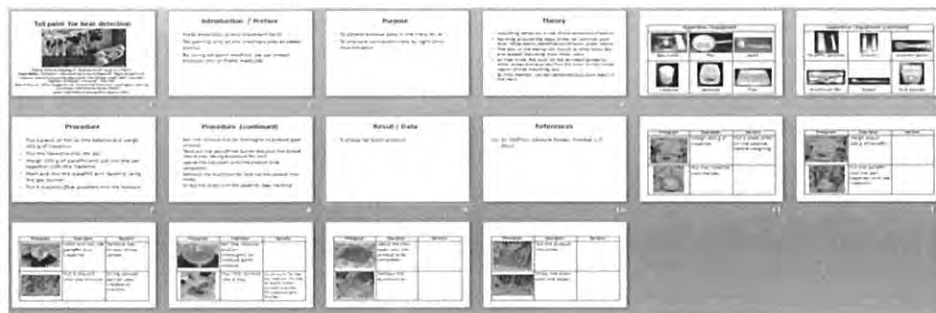


Fig 2. A typical example of a PD manual

2. Silage and silage preparation

Feed is one of the most important and limiting factor in milk and meat production. Its availability both in quality and quantity affects the production of livestock. Silage is one of the methods in preserving feed for either periods of feed shortage, or when there is a need to save surplus production. Thus, silage-making is a management tool that allows producers to match feed resources with feed demand for dairy and meat production.

Silage is preserved feed material by the process of fermentation under anaerobic condition. Silage is preferred when the pH value is below 4.2 and with relatively lower moisture content for appropriate preservation and utilization. For that matter, compaction and proper sealing of silo are best practices of silage making. Other parameters to consider during silage making are:

- Buffering capacity
- Texture
- Smell, and colour of silage as well.



Fig. Chopping, compacting and sealing are among the important procedures of silage preparation

3. Tropical pasture establishment and utilization

i. Introduction of tropical grasses and legumes

Climate affects the production and productivity of forage and pasture crops. In the tropics, these crops grow fast, mature and dry fast unless supplemented with additional moisture.

ii. Classification of pasture forages

Forage and pasture species can broadly be classified as “grasses” and “legumes”. Their management and utilization practices differ depending on many factors like climate, soil type, life form and the like. It is necessary to select the most adaptive forage and pasture species and develop appropriate management and utilization practices under such environments.

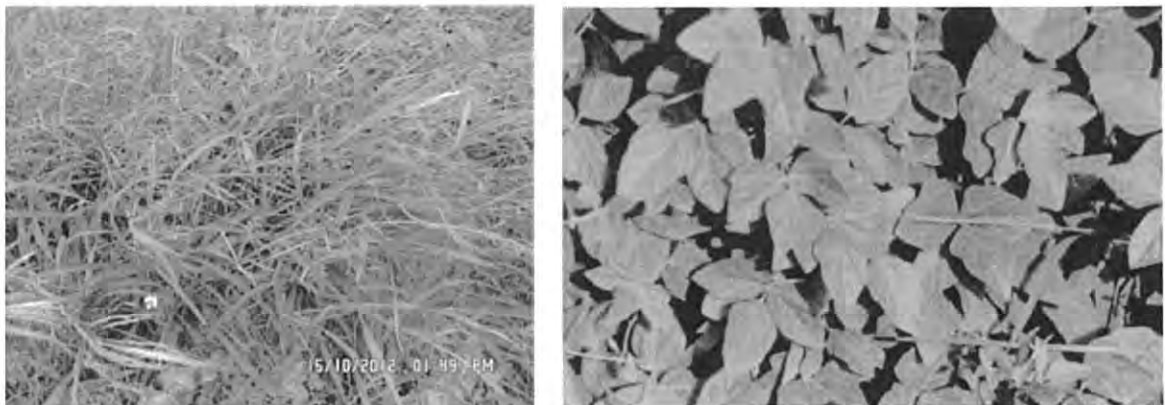


Fig 3. Tropical grass (*Panicum maximum*) (left) and tropical legume (*Siratiro*) (right)

iii. Effective silage making with tropical grasses

Concept of tropical silage: Anerobic condition favours lactic acid fermentation. This helps to preserve the feed material for the dry season with minimal loss of nutrient and

moisture. These factors could be an advantage of water supply to livestock during the dry season as compared to hay.

Experimental trial on tropical silage making: Silage can be prepared from tropical grasses by improving the energy content. Fermented juice of epiphytic lactic acid bacteria is one technique in improving the fermentative capacity of tropical silage. It is simple and low cost technique for farmers in the tropics.



Fig 4. Silage (left) and fermented juice of lactic acid bacteria (right) from tropical grasses

iv. Sustainable pasture production

Increase in animal products in developing countries and Japan: The trend in increasing production of animal products in developing countries requires sustainable pasture production. However, this has to consider the low input of resources in the system and sustainable management.

Global environmental issues: Due to increased production of meat and milk in the world, there has been strong correlation between livestock production and global warming. This is because of increased production of carbon-dioxide, methane and nitrous oxide from the livestock sector. Thus, feeds and feeding management need to consider this issue for future safe environment.

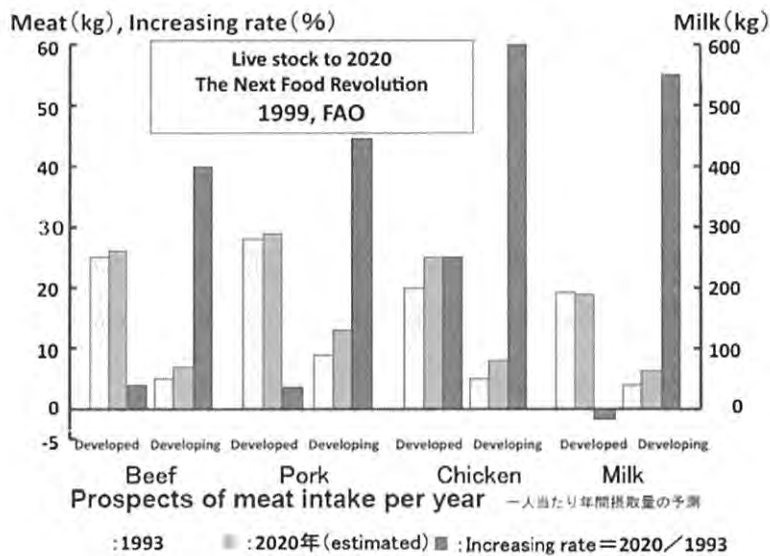


Fig 5. Increased production of meat and milk has become a threat to global environment

v. Nutrition in hot environments

Influence of heat stress on livestock: Heat stress affects meat and milk production from livestock by altering their physiological processes. Thus, appropriate management options need to be applied in livestock production under such circumstances. Tropical environments are severely affected by such problems due to prolonged and higher temperatures especially during dry seasons. Such influences can be solved through appropriate nutrition management including sufficient water. Furthermore, physical modification of barns and related structures can be options under heat stressed conditions.

4. Reproduction in dairy cows

For successful production of dairy, it is important to know the basics and details of reproduction in dairy cows. Some of the important points in this regard are briefly indicated below.

i. Understanding the ovarian function and reproductive management

For and successful production of milk, understanding the ovarian function and practicing proper management of dairy cows is very important. Some of the reproduction aspects and management practices are indicated below.

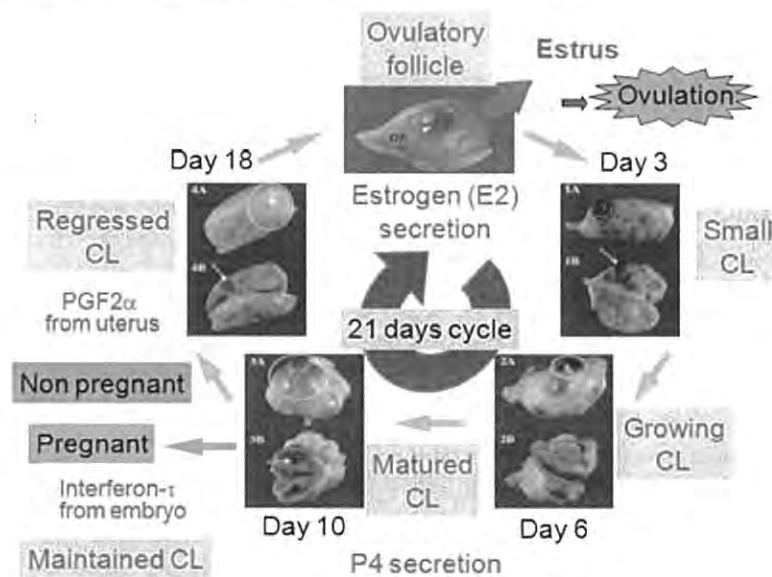


Fig 6. Estrus cycle in cattle

ii. Estrus detection and its improvement

Estrus detection is most important aspect of livestock farms that use artificial insemination for reproduction. Different techniques and skills can be applied here to improve conception rate. As estrus detection and application of AI improved, the efficiency of reproduction will also be improved in such farms.

Practical skills like tail painting and observing the behavior of cows are some of the skills in estrus detection. The use of AI scale is also one simple technique that can improve the conception rate of inseminated cows. Most of the management practices of dairy cattle affect not only reproduction but also milk yield. For example, calving interval and

days after calving can alter milk production severely. Other skills or knowledge used for successful reproduction includes:

- Synchronization for simultaneous AI
- Improved conception rate by correct AI techniques
- Pregnancy diagnosis
- Proper parturition
- BCS test

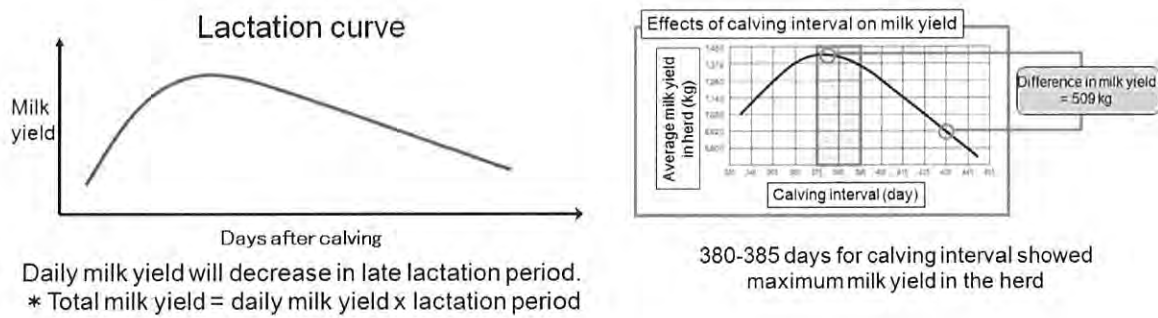


Fig 7. Milk yield affected by days after calving (left) and calving interval (right)

iii. Embryo transfer (ET)

Embryo transfer is one of the techniques of successful reproduction in dairy cattle. The technique helps in several aspects like by-passing sensitive periods, taking advantage of productive animals, and also for its economic advantages. For successful ET, appropriate techniques of embryo collection and identification of fertile embryos and also hormonal treatment of dairy cows to encourage super ovulation are among the basic points to be considered in the process.

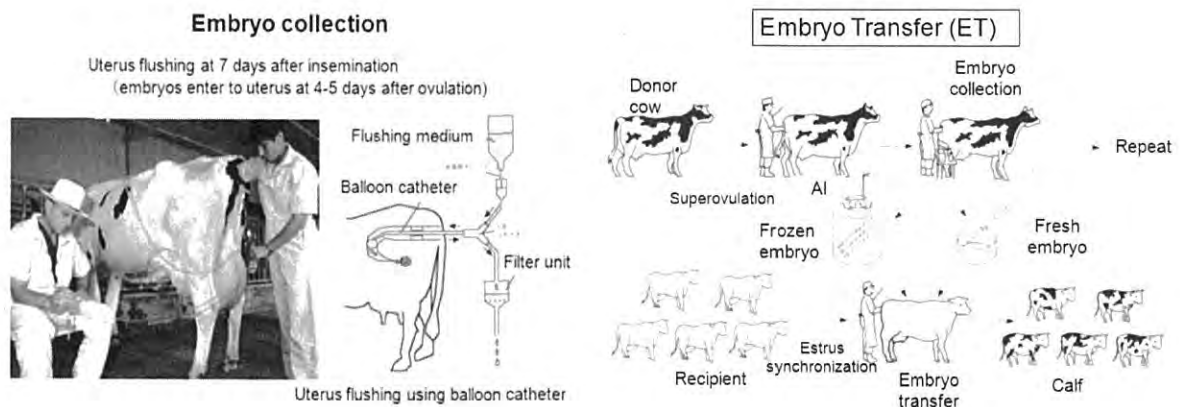


Fig 8. Techniques of embryo collection (left) and embryo transfer (right)

iv. Artificial Insemination

Artificial insemination is one of the basic reproductive technologies in livestock reproduction. However, the technique can be better utilized under the fulfillment of other related activities of reproduction. Some of these activities could be:

- Proper estrus detection for AI
- Appropriate timing of insemination
- Proper handling of semen
- Hormonal treatment and effective insemination techniques

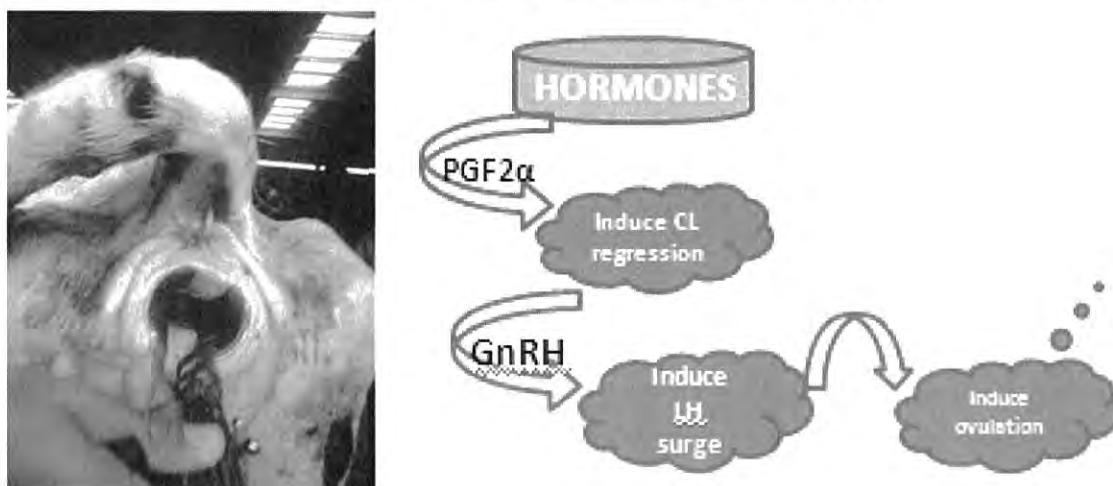


Fig 9. Vaginal examination (left) and hormonal treatment to induce ovulation (right)

AI technique can be improved through the use of measuring tools for appropriate insemination (such as AI scale), and also through hormonal treatment that can trigger estrus and ovulation. Other techniques used for improving proper AI application are the following

- Observing and evaluating standing and mounting behaviors of dairy cattle
- Pregnancy diagnosis of inseminated animals and reapplication when failed
- Rectal palpation
- Ultrasound examination

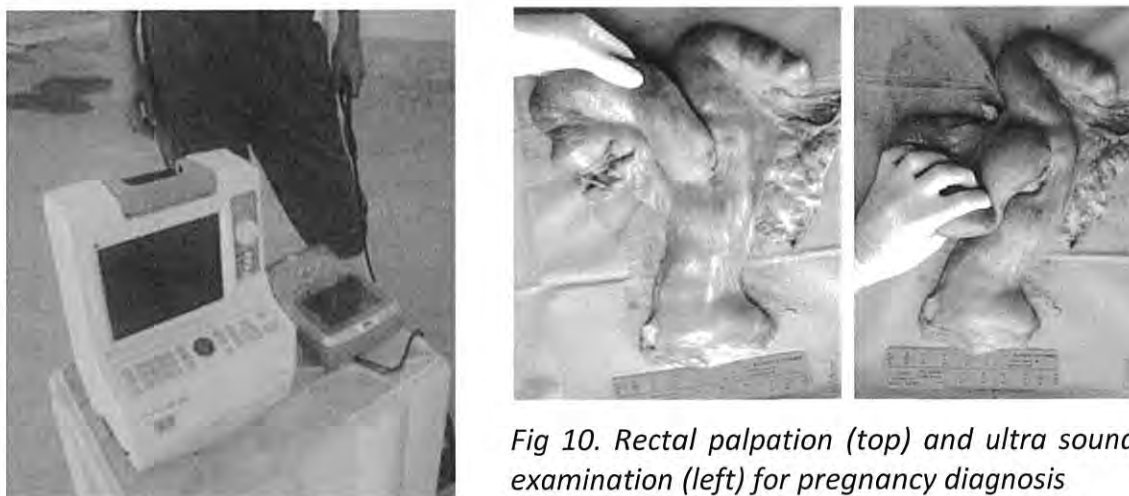


Fig 10. Rectal palpation (top) and ultra sound examination (left) for pregnancy diagnosis

5. Beef cattle production

Beef production and consumption differs in different parts of the world for several reasons. Some are related to genetic potential of beef cattle, some are related to management aspects and some are related so socio-cultural issues. Due to its high production cost, beef consumption is low in Japan as compared to other developed countries.

However, beef production can be improved through the utilization of locally available feed resources; and minimize cost of forage production. Beef can also be produced from strategic utilization of dairy animals. Most male calves and also some old dry cows from

dairy farms can be grown and fatten to beef cattle for increased meat production. Some additional points in beef cattle production are discussed below.

By products utilization for beef production: By-products like sugar beet pulp, potato starch residue, pine apple pulp and the like are important energy feed sources and/or supplements for beef cattle production. Protein concentrates such as brewery grain and oil seed meals are also used when available. However, protein concentrates from livestock products like bone meal are banned due to health concerns in Japan.



Fig 11. Pineapple pulp (left) as feed source, and beef cattle (right) in Japan

Properties of meat: Understanding the pre mortum and post mortum properties of meat is important in proper utilization of meat. It is also important to know appropriate method and techniques of meat preservation for prolonged use.

Meat processing and grading: For easily handling, utilization and storage, meat is processed and graded based on predefined standards. In order to come up with such processes, appropriate skill, knowledge and technology have to be applied in meat processing factories. These are some of the basic concepts that meat producers need to know prior to investment.



Fig 12. Meat processing (left), and color standards for meat grading (right)

6. Disease and disease prevention of dairy cattle

For improved milk production, it is important to know diseases of dairy cattle and their prevention methods. Some of the common diseases of dairy cattle may include: milk fever, dystocia, prolapsed uterus, puerperal fever, placenta retention and the like. Thus it is important to know the causes and treatments of these diseases in dairy cattle production.

It is very important to keep the animal barn in hygienic condition to prevent diseases. The barn needs to be clean, well ventilated, properly bedded and spaced for proper management of health animals.



Fig 13. Dairy cow suffering from milk fever

7. Hygiene control of milk and milk products

Although many factors affect the quality and quantity of milk, its hygienic condition is the most limiting factor that governs consumption. Simple techniques can be applied in examining the hygienic condition of milk.

i. Hygienic management and examination of milk

Field method to assess milk freshness: Alcohol test is one of the tests to evaluate the hygienic condition and freshness of milk at field. Other techniques like the clot – on boil technique can also be applied for easy assessment of milk. There are also many other parameters to consider during milk evaluation. However, detailed laboratory examination of milk is necessary for safe utilization.

ii. Lactation physiology and mastitis control

Milking: pre-milking stimulation encourages dairy cows to freely avail milk in the udder. Understanding of other concepts of lactation physiology of dairy cows is also important for proper management of lactating cows.



Fig 14. Milk testing (left), and milking practice (right)

Mastitis control: mastitis is a disease caused by inflammation of mammary glands due to infection by microorganism. Mastitis is most common disease in dairy cattle, often caused by poor management conditions of the cow as well as the barn. By conducting PL test, mastitis can be easily detected.



Fig 15. Mastitis checking method

8. Theory and practice of the metabolic profile test (MPT)

The MPT is an important tool of evaluating the overall performance of a certain farm (dairy or meat or both). Regular records of all aspects of management like feed, feed composition, nutrient composition, dry matter intake, animal performance, milk or meat yield are necessary for better examination and analysis.

Body condition Score (BCS) is one of the simplest techniques in evaluating the nutritional condition of dairy or beef cattle herd. Such techniques can be best utilized through frequent practice.

B. Manuals prepared during the training period

During the training period, four PD manuals were prepared. Among which, one has been translated in to local language to exemplify the applicability of the methods at local level.

The four PD manuals prepared are:

- PD manual of silage making
- PD manual of FJLB preparation
- PD manual of tail paint technique
- PD manual of AI scale

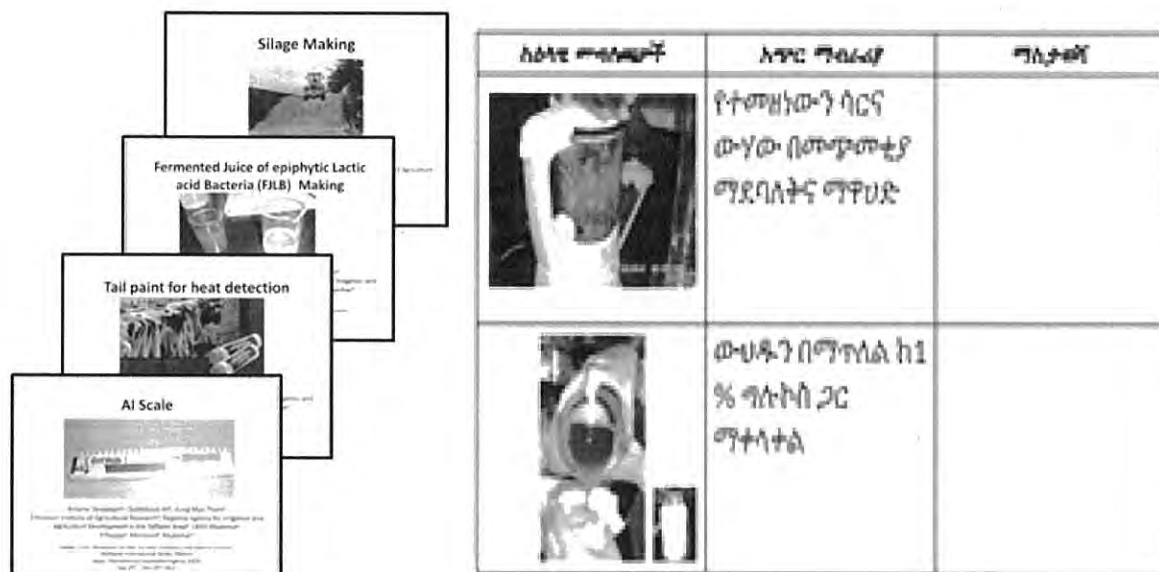


Fig 16. PD manuals prepared (left), and PD manual translated to local language (right)

C. Action Plan

I. How to utilize PD manuals during skills and knowledge dissemination

Having taken the knowledge, skill and experiences in Japan, I would like to utilize the manuals for skills and knowledge dissemination

Table: Summarized table of activities to be conducted using the manual prepared during the training

	Description of activities	Assumptions	Duration	Participants
1	Manual revision and translation	Technical terms usage	Dec 01 – Dec 15 (2012)	Kidanie
2	Manual evaluation, multiplication and distribution	Sufficient time and budget	Dec 28 (2012) - Jan 15 (2013)	Researchers
3	Training on PD manual preparation and utilization	Sufficient time, active participation and budget	Jan 20 – Jan 23 (2013)	Researchers, T. Assistants
			Jan 26- Jan 29 (2013)	Develpm't Agents
4	Training on tropical silage making	Active participation and budget	Feb. 15 – Feb. 18	TAS and DAS
			Mar 01 – Mar 03 (2013)	Pastoralists
5	Training on heat detection techniques	Active participation and budget	Apr. 15 – Apr. 20 (2013)	TAS and DAS
6	Reporting	Activities executed as planned	May 05 – May 20	Kidanie

Notes:

- Financial sources could be JICA Ethiopia and/or Ethiopian Institute of Agricultural Research (EIAR)
- Assumptions are made to this action plan and shall not be constraints
- Schedule may subject to certain modifications

II. Manuals to be prepared

The following manuals will be prepared in my job station to assist the research and related activities of livestock

1. PD Manual for hay making: hay making is one of the most common practices in feed utilization in the tropics. Thus a typical manual is necessary to facilitate the process.
 - Duration: Dec 18 to Dec 24 (2012)
 - Assumptions: sufficient time

2. PD Manual for forage and pasture crops production
 - Duration: Feb 07 to Feb 10 (2013)
 - Assumptions: sufficient resources

III. Activities to be worked out using experiences in Japan

1. Improve the hygienic condition of the barn in the research center
The following assumptions will be met to carry out the task.
 - Mobilizing both financial and human resources of livestock research in our center
 - Assistance from the center management

Duration: Throughout the year

2. Assessment of milk hygiene conditions by using alcohol test
The following assumptions will be met to carry out the task.
 - Sufficient time
 - Willingness of pastoralists

Duration: Throughout the year (randomly)

Acknowledgment:

I would like to acknowledge all staff members of JICA, Obihiro University of Agricultural University (Hokkaido) and Ryukyus University (Okinawa), milk or meat processing companies, laboratories as well as dairy and/or beef farmers in Japan that helped us to know better during the training period.

Interim Report

Established by Mohamed Ben Lakhel (Morocco)

Title of course:

Cattle Management for Milk and Meat
Production Using Regional Resources

JICA Training Course, 2011

Structure of Interim Report

- ❖ Review of the course
- ❖ Manual making with PD method
- ❖ Action plan

Objective of Interim Report

- Transfer of techniques and information which I obtained in this course to my region.
- Support my activities for improvement of cattle production system in my region.

Review of the course

Contents	Pictures																																	
<p>Reproduction</p> <p>A.I. Technique in Cattle</p> <p>Some of the most important aspects to remember when inseminating a cow to attain maximum breeding efficiency are:</p> <ul style="list-style-type: none"> • Be gentle. Don't use too much force. • Insemination is a two-step process. Get the gun to the cervix. Place the cervix over the gun. • Deposit the semen just through the Cervix into the uterine body. • Take your time. • Relax. <p>Making Scale for Detection of Optimum Timing of Artificial Insemination (A.I.)</p> <p>The most limiting factor in artificial insemination programs is the proper detection of cows or heifers in estrus.</p> <p>Proper timing of the artificial insemination (A. I.) is necessary to accomplish a high percentage of conceptions in the cows that are bred artificially</p> <ul style="list-style-type: none"> • Scale for detection of optimum time for the Artificial Insemination. • Very simple Method to know the exact time to inseminate the cow. • It is a tool that can be used in the farm. • Practical and cheap method. 	<div data-bbox="922 577 1353 878" data-label="Image"> </div> <p data-bbox="791 913 1477 981">Push the plunger slowly so that drops of semen fall directly into the uterine body</p> <div data-bbox="903 1048 1369 1281" data-label="Image"> </div> <div data-bbox="826 1384 1385 1482" data-label="Figure"> <p>Example 1:</p> <table border="1"> <tr> <td>0</td> <td>6h</td> <td>12</td> <td>18</td> <td>24</td> <td>30</td> <td>36</td> <td>42</td> <td>48</td> <td>54</td> <td>60</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>O</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td>ESTRUS</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> </div> <p data-bbox="849 1617 1407 1639">In this case the estrus start at 6:00 am ovulation will happen 30 h after the starting of estrus the best time of insemination is at 6:00 am next day.</p> <p data-bbox="769 1706 1487 1809">In this case the estrus start at 6:00 am ovulation will happen 30 h after the starting of estrus .The best time of insemination is at 6:00 am next day.</p>	0	6h	12	18	24	30	36	42	48	54	60					O												ESTRUS					
0	6h	12	18	24	30	36	42	48	54	60																								
				O																														
					ESTRUS																													

How to use tail paint for heat detection

Before and after standing

Disappear paint by mounting of other cows

Morphological changes in bovine ovary during estrous cycle

Pregnancy diagnosis

Non-return to estrus

- If estrus signs are not observed around 3 weeks after service or insemination, the cow is generally assumed to be pregnant.
- Even if estrus detection is good, not all of these cows will be pregnant.
- On the other hand, up to 7% of pregnant cows will show some signs of estrus during pregnancy.
- Insemination of these animals may result in embryonic or fetal death

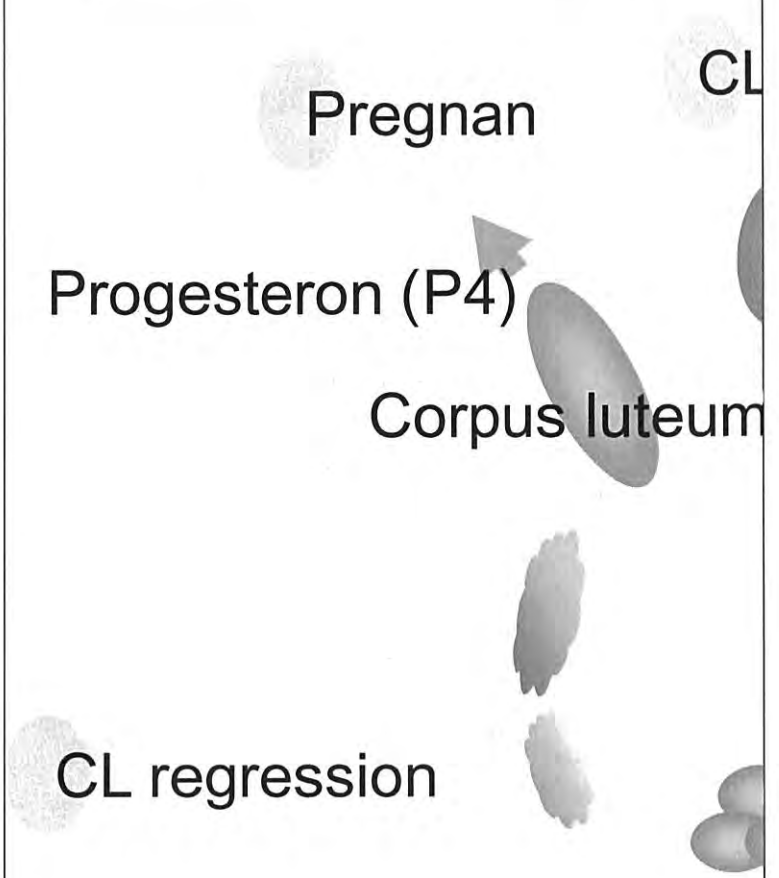


Before standing



After standing

Morphological changes during estrus



Reproductive Management

- ① Fresh check (3-4 weeks after parturition)
Checking recovery of uterus and ovarian function
- ② Voluntary Waiting Period (40-60 days after parturition)
Try to find ovarian cycle
- ③ Artificial insemination (AI) (>60 days after parturition)
- ④ Pregnancy diagnosis (30-37 days and 60 days after AI)
- ⑤ Treatment for reproductive disorder

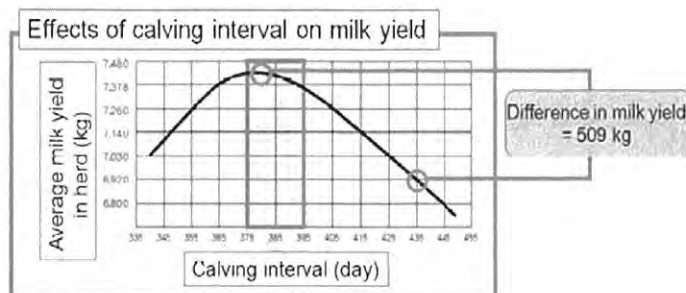
Heat Stress in Dairy Cattle

Heat Stress:

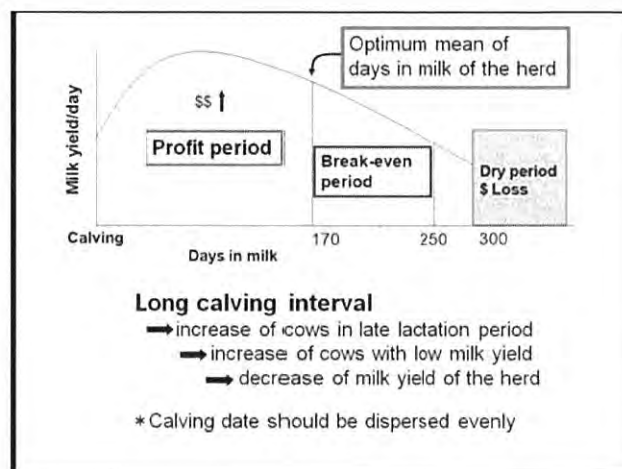
- The point at which a dairy cow (or other animal) cannot dissipate an adequate quantity of heat to maintain body thermal balance or normal body temperature

How About Milk Production?

- Decreases due to:
 - More energy for maintenance
 - Less energy for productive functions
 - Lower dry matter intake
 - Alterations in nutrient use
 - Can drop milk yield 10 to > 25%



380-385 days for calving interval showed maximum milk yield in the herd



Increased respiration rates (>70/hour)

Experimental Silage :

- Can be conducted using simple glass bottles.
- This method is more useful for researchers and extension workers.
- The method can be used to find better silage making conditions.
- The best results of experimental silage making can be used at larger scale in farmers conditions.

Silage making:

- Conserving forage crop at a high moisture content and fermenting in pit, tower, bunker, trench or plastic silos.
- This process should occur in anaerobic condition.
- Silage is considered as a better way to conserve forage crops.
- We can conserve green forage at the time of surplus and use it during the season when there is feed shortage.
- Benefits (Importance)
 - Store of feed for scarce season
 - Enhance rumen condition
 - Improve milk yield
 - Improve farm income in season of feed shortage

Method of Making the Fermented Juice of Epiphytic Lactic Acid Bacteria (FJLB)

- FJLB is used to improve the fermentation of silage.
- Economically and easy to prepare by farmer.

The treatment with FJLB increased lactate concentration and decreased losses of nutrients in silage as well as gave highest potential digestible and degradable fractions





THE TRAINING COURSE OF CATTLE MANAGEMENT FOR MILK AND MEAT PRODUCTION USING REGIONAL RESOURCES

Established by : OULAHBOUB Ali

From : Kingdom of Morocco

November 2012

JICA Obihiro, Japan

STRUCTURE OF THE INTERIM REPORT

ACKNOWLEDGEMENTS

- 1- REVIEW OF THE COURSES COVERED**
- 2- LIST OF THE PD MANUALS MADE IN THIS TRAINING**
- 3- ACTION PLAN**

CONCLUSION

APPENDIX: "SILAGE MAKING" PD MANUAL TRANSLATED INTO FRENCH LANGUAGE

ACKNOWLEDGEMENTS

I want to thank the Director of Tafiulet Agricultural Development Agency and the Chief of the Department of Livestock who have appointed me to participate in this training

Also I want to express my highest gratitude to JICA to give me the training and all of its staff for their kindness, their organization and serious.

My thanks also to Dr. Hanada and the other lecturers who have agreed to share their experiences with us.







My great thanks also to our nice, very kind and unforgettable training coordinator Maki ISHIWATA for her help and her patience.

1- REVIEW:





The main aspects covered by this training are:

1.1 PD manual making:








The "PD manual" method is a technique using photos to describe a given procedure. It is very simple since it can easily get messages.

Contents	Pictures									
<p>PD manual as a technique to convey the message easily</p> <p>How to make a PD manual ?</p>	<table border="1"> <thead> <tr> <th data-bbox="746 779 922 810">Photograph</th> <th data-bbox="922 779 1098 810">Description</th> <th data-bbox="1098 779 1273 810">Remarks</th> </tr> </thead> <tbody> <tr> <td data-bbox="746 810 922 958"></td> <td data-bbox="922 810 1098 958">Put the chopped corn stover into the silo</td> <td data-bbox="1098 810 1273 958">Do not fill up the silo at once</td> </tr> <tr> <td data-bbox="746 958 922 1106"></td> <td data-bbox="922 958 1098 1106">Press well the corn stover in the silo</td> <td data-bbox="1098 958 1273 1106">Clean up the boots Minimize the oxygen content</td> </tr> </tbody> </table>	Photograph	Description	Remarks		Put the chopped corn stover into the silo	Do not fill up the silo at once		Press well the corn stover in the silo	Clean up the boots Minimize the oxygen content
Photograph	Description	Remarks								
	Put the chopped corn stover into the silo	Do not fill up the silo at once								
	Press well the corn stover in the silo	Clean up the boots Minimize the oxygen content								





1.2 Reproduction:

Contents	Pictures	
<p>Bovine ovarian function</p> <p>Why reproduction is important in dairy cows ?</p> <p>Important points for AI</p> <p>Hormonal treatment to increase the chance for AI</p>		
<p>Embryo transfer</p> <p>Pregnancy diagnosis</p> <p>Tail painting for AI detection</p> <p>AI scale</p>		

1.3 Animal nutrition:

Contents	Pictures			
<p>Silage making</p> <p>Tropical pasture production and utilization</p> <p>Experimental training on tropical silage making (Fermented Juice of epiphytic Lactic acid Bacteria (FJLB) making)</p> <p>Nutrition and feeding management of cattle under tropical conditions</p> <p>Utilization of by-products as animal feeds</p> <p>Nutrition of dairy cows</p>				
				Silage making
			FJLB Making	
			Use of by-products	

1.4 Milk management and milking practice:

Contents	Pictures	
<p>Hygienic handling of raw milk</p> <p>Simple methods of bacteriological examination</p> <p>Milking practice</p>		
		







1.5 Evaluation of meat quality:

Contents	Pictures	
Processing of meat Meat grading		

1.6 Diseases and diseases prevention of dairy cows:

- Perinatal diseases of dairy cows and their management
- Hygiene of animal house barn
- Mastitis in the dairy farms

1.7 Site visits:

Contents	Pictures	
Dairy farms Beef farms		
	Dairy farm	Beef farm
Ranch Agricultural cooperative memorial hall		
	Ranch	Agricultural cooperative memorial hall
		
	Compost making as a way to increase the farmer income	

2- LIST OF THE PD MANUALS MADE IN THIS TRAINING

- + Silage Making
- + Tail paint for heat detection
- + AI Scale
- + Fermented Juice of epiphytic Lactic acid Bacteria (FJLB) Making.

3- ACTION PLAN:

3.1 Diagnosis of the current situation:

My area has several constraints such as:

- Scarcity and high variability of water resources
- Small farms
- Lack of small processing industries
- Large distance from markets of agricultural production
- Excessive prices of the concentrated feedstuffs.

My organization conducted a diagnostic study of 144 dairy farms 2 months to detect the problems that hinder the cattle development . The main results of this study are as follows :

Animal nutrition:

According to this study:

- 80 % of the production price is due to the animal nutrition,
- 90 % of feed comes from outside the farm
- Only 10 % of farms use mineral and vitamin supplement

The commonly used feeds are :

- Alfalfa
- Wheat straw
- Wheat bran
- Compound feed

The dairy rations are in general unbalanced.

Reproduction :

The reproduction parameters are not satisfactory. In fact :

- The succes of the first artificial insemination is only 26 %
- The number of the cows inseminated more than 3 times represent 46 %
- The calving interval is very high : 440 days in average.

Herd management:

This is the most important aspect because it is related to the decisions making which has direct effects on the herd. The study shows that:

- 35 % of the dairy herd are managed by the breeder himself
- 35 % by a family member
- 20 % by the breeder's wife
- 10 % by a worker

Recording of data:

This is very important since it allows to follow carefully the herd. Unfortunately, in my region:

- Only 16 % of the breeders record daily herd data
- 20 % rarely record data
- 62 % don't record herd data

Animal housing:

According to the study:

- Only 14 % of the animal housing are in good condition
- 43 % are medium
- 43 % are in bad conditions

In addition, 90 % of the animal housing is restricted stall, which makes the detection of heat very difficult.

Milk productivity:

Despite the cooperative uses cows composed of 92 % of Prim Holstein and 8 % of cross-breed, the productivity of milk is very low (14.3 Liters/cow/day).

3.2 How to correct some of these shortcomings using what we learned in Japan ?

3.2.1 PD Manuals to translate and disseminate:

Among the 4 PD manuals we realized, I will translate in Arabic and disseminate 3 of them that are:

- Silage making using big plastic bags
- Taint paint and AI scale especially for the big farms.

The schedule for this activity is as follows:

PD Manual	Translation	Responsible	Dissemination	Responsible
Silage making	Second week of December 2012	Oulahboub Ali	January – March 2013	Extension staff
Tail paint	Second week of December 2012	Oulahboub Ali	January – March 2013	Extension staff
AI scale	Second week of December 2012	Oulahboub Ali	January – March 2013	Extension staff

3.2.2 PD manuals to make and disseminate:

- PD manual "Balanced rations for dairy cattle":
 - + How to balance rations using local resources
 - + Total mixed ration as a way to avoid rumen dysfunctions
 - + The importance of minerals and vitamins in animal nutrition
 - + The importance of water supply for milk production
- PD manual "Milking practice improvement" by introducing some of the Japanese techniques to improve our local milking practices.

The schedule for these activities is shown below:

PD Manual	Making	Responsible	Dissemination	Responsible
Balanced ration for dairy cattle	January 2013	Oulahboub Ali	February – April 2013	Extension staff
Milking practice improvement	February 2013	Oulahboub Ali	Continuous starting from March 2013	Extension staff

3.2.3 Other activities:

The high price of the silage machine hinders the development of this technique in my region. I think introducing small machines suitable for small farmers is the best way to promote silage making in the Tafilalet area.



CONCLUSION:

This course, which lasted two months is very important since it includes:

- Theoretical aspects
- Practical aspects
- Site visits.

It is also important for me because it helped me to refresh my knowledge in the field of animal production. Moreover, it allowed me to acquire other techniques, mainly PD manual making which is very important in the field of extension.

APPENDIX

La technique d'ensilage



Kidanie Dessalegn ^a, Oulahboub Ali ^b, Aung Myo Thant ^c
Institut éthiopien des Recherches agricoles ^a, Office Régional de Mise en Valeur
Agricole du Tafilalet ^b, LBVD Myanmar ^c
Ethiopie ^a, Maroc ^b, Myanmar ^c

Stage: Gestion des bovins pour la production de lait et de viande en utilisant les
ressources locales

Agence Japonaise de la Coopération internationale (JICA), Obihiro, Japon

ORMVA des DOUKKALA

MOROCCO

JICA

JAPAN

GROUP TRAINING PROGRAM

**Principle and practice of Cattle management for Milk and
Meat production using regional resources**

INTERIM REPORT

Presented by:

Abdelkrim El Assouli

November 2012

SUMMARY

- 1- REVIEW OF COVERED ASPECTS
- 2- DEVELOPPED PD MANUALS
- 3- ACTION PLAN

INTRODUCTION

The Division of Zemamra supervises an area of 80,929 ha including 20,629 ha in irrigated zone and also supervises and monitors the livestock sector, the dairy cooperatives; the artificial insemination and is also responsible for the connection and the coordination with the different actors in the sector: breeders associations, dairy cooperatives.

The number of dairy cows is 35,000 heads. The main type is Prim'Holstein. The majority of the farmers use artificial insemination. The crossing targets as well milk and meat together or separately.

Some small holder breeders are still practicing milking manually whatever a great number of them have introduced small milking machines for this purpose.

In most small barns there is a lack of hygiene. The farmers almost only wash the adder with water. In some middle and great holders, few farmers use disinfectant.

Milk production in Zemamra's division reaches an average of 50,000 tons a year and beef meat production is about 3000 tons a year.

The milk is collected and sold to dairy factories by about 65 cooperatives. In general sold milk is medium quality.

Because of the number of cattle is higher compared to the area allocated to forage (2.5%) which means 0.3 ha of forage per cow, the feeding of animals consist on grazing in some uncultivated parts of land from January to June, and feeding with alfalfa or clover from November to July. Also wheat straw and dried sugar beet tops and leaves and corn are used as feed from August to January. Beet pulp and concentrates are used all the year.

The low average of milk production per cow in the area which is about 1400 liters per year shows that cattle suffer a lack of feed.

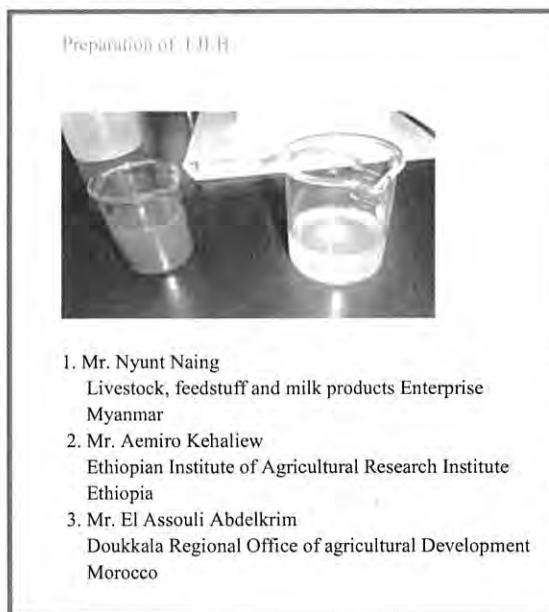
This situation urges introduction of new techniques to provide more feed and to improve existent feed currently misused.

PART 1 – REVIEW

I- COVERED TOPICS

1- Making a PD manual

This manual is very simple and easy to make. It doesn't require anything expensive but only a good camera and a color printer. A PD manual is a powerful tool to be used to improve the extension methods not only in agricultural field but can also be extended to all other fields.



2- Use of by-products for silage making

By-products can provide enough best feed for cattle. In Morocco, people waste a lot of by-products especially orange juice residues. Those residues, thrown in trashes, increase the volume of urban garbage. Their

efficient use as cattle feed can have a real benefit for farmers, for the environment and can save money spent to gather them.

Some by-products are misused. Farmers use to dry beet sugar tops and leaves. They can make good cattle feed if they use them as silage.



3- Testing silage quality by senses

It's a very simple technique which can help farmers themselves for checking silage quality.



4- Simple examination of milk for bacteria

The examination is based on petrifilm count method. The raw milk is examined for bacteria such as coliforms, E. coli and staphylococci.



5- Simple field methods to assess hygienic quality of milk

This method includes:

- Sensory Test
- Boil-on-clot Test
- Alcohol test for coagulation



6- Hands washing

People use to wash their hands and think that is alright. If only they know about what remains, they should better learn how to wash them in an effective way. The practice session implemented shows the best way to proceed.



7- Hygienic practice of milking

This practice method ensures good hygienic rules.



8- Checking milk for mastitis

Within this practice, it is easy to check for mastitis.



II- LIST OF PD MANUALS

1- Making FJLB

Fermented Juice for epiphytic lactic acid Bacteria (FJLB) helps as a starting material for good quality silage making and can improve lactic acid and decrease pH in silage.



2- Tail painting



Method used to detect estrus for improving efficiency of AI and conception rate.

3- Efficient time of AI determination

Tool used to determine the appropriate time of insemination and to complete the tail painting method.



PART 2 – ACTION PLAN

1-Utilization of the manuals

i - Tail painting

- Two barns from different areas belonging to middle holders (about 40 cows) will be chosen to use this technique.

- In order to disseminate this technique all over the area, other farmers will be invited to visit the farm already chosen. The procedure then will be explained and the manual will be distributed.

ii- Disseminating PD manual technique as an extension tool

The general pattern to disseminate this technique is as follows:

First, this method will be presented to the extension service chief in order to make a plan including training and workshops for its dissemination to other divisions.

Second, this tool will be presented and explained to different visitors from other part of the country. If interested on, trainings and workshops will be planned.

2-Planned PD manual to make

i- Milking practice:

The goal is to make a tool that can help farmers to use hygienic milking practice and enables them to check for mastitis.

ii- Making sugar beet tops silage :

The farmers in Doukkala store sugar beet tops and leaves after drying them. By silage, the quality of this by-product can be improved and its contents spared.

3- Timing of the action plan for transferring new techniques, making new PD manuals and disseminating PD manual tool

N ⁰	Theme	Plan	Responsible	Target Group	Goal	Timing
1	Utilization of the manuals	Tail painting	-Zemamra Agricultural Division	Farmers	Disseminating the tail painting technique	December 2012 to July 2013
2		Hygienic Milking practice	-Zemamra Agricultural Division -Extension Service		To adopt hygienic practice	March 2013 To April 2013
3	Planned manuals to make	-Making sugar beet tops silage and -Training and workshops about PD manual tool	-Zemamra Agricultural Division -Extension Service -Animal production service	- Technicians - Extension officers -Farmers	-Enhancing efficiency of this feed and - Disseminating PD manual as an extension tool	February 2013 to July 2013

PART 3 – OTHER ACTIVITIES

- **Developing a unit for using orange juices residues as silage or dried for feeding cattle**

By-products can provide enough best feed for cattle. In Zemamra area, orange juice residues are thrown in trashes, increasing the volume of urban garbage. To use them as cattle feed can have a real benefit for farmers and for the environment.

A study for developing a small unit in a cooperative for making dried feed or silage from wasted orange juice residues will be planed after the agreement of all stake holders including agricultural services, local authorities, and local municipality council and with the participation of development and aid agencies, National Initiative for Human Development and research institutes.

The goal of developing such facility is increasing mainly providing good feed for cattle. This project can also contribute in increasing cooperatives income as well as promoting work opportunities and contributing in safeguard of the environment.

Timing of the study

Steps	Responsible	Plan	Goal	Timing
1	Zemamra Agricultural Division	Contacting stakeholders : (Animal Production Service, authorities, National Initiative for Human Development, local municipality council etc	-agreement of all stakeholders - rate and task of each stakeholder within the project -choose of the area and the cooperative that will receive the project	December 2012 to February 2013
2	-Zemamra Agricultural Division	Leading surveys and inquiries in targeted places (Restaurants, snakes, Cafes, Households, Hawkers....)	Estimation of: -The amount of recoverable wasted orange residues - Determination of the efficient method to use for gathering them	March 2013 To December 2013
3	-Animal production service	studying the economic and financial aspects of the project	To achieve a sustainable project	December 2013 to March 2014
4	-The cooperative -Municipal environment service	Further studies if necessary	To provide more information or more clarifications	March 2014 to July 2014
5	- Concerned stake holders	Developing the design of the unit according to the results of the study		July 2014 to December 2014
6		Implementing the unit and launching the project monitoring and assisting the project		2015

収集資料リスト

【エチオピア】

- PD マニュアル Quick Reference for Determination of Milk Fat - Mr. Firew Kassa Esho (電子データ)
- PD マニュアル Quick Reference for Determination of Milk Protein - Mr. Firew Kassa Esho - Mr. Firew Kassa Esho (電子データ)
- PD マニュアル Silage Making エチオピア語 - Mr. Tarekegn Kidanie Dessalegn (電子データ)
- Training on Silage エチオピア語 - Mr. Tarekegn Kidanie Dessalegn (電子データ)
- Concepts and Methodologies of Process Description (PD) Manual Preparation パワーポイント - Mr. Tarekegn Kidanie Dessalegn (電子データ)
- Manual by PD Method - FRG2 Project (電子データ)
- PD method for extension information パワーポイント - FRG2 Project (電子データ)
- FRG2 Project 主催帰国研修員による PD マニュアル研修の写真 - FRG2 Project (電子データ)
- FRG2 Project 上記研修の成果品事例 5 種 - FRG2 Project (電子データ)
- Extension Material Development Workbook - FRG2 Project
- List of Selected FRG-based research project 2012 - FRG2 Project
- Seminar Announcement “Cattle Management for Milk and Meat Production Using Regional Resources” - FRG2 Project (電子データ)
- Training Report - Training on Basic Concepts and Applications of FRG Approach for Agricultural Researchers - Werer Agricultural Research Center (電子データ)

FRG2 Project : Project for Enhancing Development and Dissemination of Agricultural Innovations through Farmer Research Groups

【モロッコ】

- THE BREEDING IN THE TAFILALET AREAPD パワーポイント - Mr. Mohamed Ben Lakhal, Mr. Oulahboub Ali (電子データ)
- PD マニュアルサイレージ (アラビア語) - Mr. Oulahboub Ali (電子データ)
- PD マニュアルテールペイント (アラビア語) - Mr. Oulahboub Ali (電子データ)

- PD マニュアルテールペイント (仏語) - Mr. El Assouli Abdelkrim (電子データ)
- PD マニュアルテールペイント (アラビア語) - Mr. El Assouli Abdelkrim (電子データ)
- RAPPORT SUR LA FORMATION 2種 - Mr. El Assouli Abdelkrim (電子データ)
- Principle and practice of Cattle management for Milk and Meat production using regional resources FINALISATON PHASE - Mr. El Assouli Abdelkrim (電子データ)
- FORMATION SUR LA CONDUITE DES BOVINS POUR LA PRODUCTION DU LAIT ET DE LA VINDE EN UTILISANT LES RESSOURCES REGIONALES - Mr. El Assouli Abdelkrim (電子データ)
- L' OFFICE REGIONAL DE MISE VALEUR AGRICOLE DU TAFILALET (動画電子データ)
- THE REGIONAL OFFICE OF AGRICULTURAL DEVELOPMENT OF THE TAFILATET (動画電子データ)
- Regional Agency for Irrigation and Agricultural Development of Tafilalet - Ministry of Agriculture and Land Development
- Office Regional de Mise en Valeur Agricole du Tafilalt