



# **Adoption of Calf Management Practices Introduced by ARF Project and Its Impact in Bishoftu, Oromia, Ethiopia**

Presentation at an International Webinar on  
**“Experiences with natural ways of dairy calf raising”**

**Daniel Temesgen (PhD), Getachew Gebru Tegegn (PhD), and  
Tafesse Mesfin(DVM)**

## Project background

- NWO-Applied Research Fund (ARF) project (3 years)
- October 2017-October 2020
- Leader: ESAP (Ethiopian Society of Animal Production)
- NL Partners: RIKILT, Dutch Farm Experience
- Ministry of Agriculture and Livestock Resources (incl. VDFACA laboratories)



## Project goals

Overall goal: Improve quality and quantity of milk in terms of chemical (antibiotic) residues

- Enhance the laboratory control capacity
- Improve cattle health in two pilot communities, through implementation of the Natural Livestock Farming (NLF) 5-layered methodology
- Establish outcomes through milk quality control



## NLF 5-layered strategy: management at the base



# Materials & methods

## *ARF project*

- A research project funded by the Applied Research Fund (ARF) from the Dutch government (January 2018 - December 2020)
- Target groups of the project were smallholder per-urban dairy farmers (50% female), with a herd of average 4-10 dairy animals
- A baseline survey was conducted to monitor the ongoing farming practices and identify problems, followed by 2 years of activities
- 2021: Follow-up is being carried out to capture its impact.

# Materials & methods

## *ARF project*

- A baseline survey was conducted from (n=60) registered (working with project) smallholder dairy farmers through personal interview
- It was generalized survey containing several questions regarding general farm practices
- The survey included calf rearing practices, such as colostrum feeding, calf husbandry and nutrition.
- The baseline survey data was analyzed to assess the adoption of calf management practices, to determine impact of adoption on the income level, and what farmers perceive as important factors for rearing calves.

# ARF project

## *Community Training and Monitoring*

- After the baseline survey we developed community training and practices on calf management - comprised of simple, adoptable and impact oriented messages
- Training was provided to the project farmers by ARF – through national and international input
- Innovative training techniques were adopted, including the use of practices, problem-based learning, and direct farmer counseling in order to disseminate the messages
- Monitoring sheet was developed for monthly recording of the changes on the farms by our field coordinator and assistants throughout the duration of project



# On-farm dairy calf management training





# *ARF project: calf management*

- For this presentation out of the many other training and key messages of the ARF project, the adoption and impact of calf management practices was selected.
- Through a preliminary survey (n=60 of participating farmers involved in various project activities - and 54 control).
- In 2021, we carried out a follow up survey from the same group of registered farmers (n=60) and a control group of farmers (n=54) from the same villages in order to compare the adoption rate of the calf rearing practices introduced by ARF project and its impact.
- The control group never attended project training sessions.

# Results preliminary survey

- The majority of the smallholder farmers (60%) did not offer colostrum to their calves immediately after birth.
- Most of the farmers (55%) weaned their calves off milk at 6 months while 39% retained calves on their mother up to one year of age.
- Some farmers started offering green fodder and concentrate to their calves from 1 month of age, with many starting this procedure at 2 months of age

# Causes of calf mortality

**Table 2: Causes of calf mortality in the farms (n = 60)**

Cause of mortality	Relative contribution of Causes, proportion (%)
Disease	75.2
weak at birth	5.8
Bloating	3.5
Sudden deaths	10
Dystocia	1.9
Malnutrition	3.8

Among the causes of calf mortality recognized by the farmers during the individual interview, disease was the major problem, followed by sudden deaths and weak at birth. Mean annual mortality owing to disease was 13.4%, contribution of disease to calf mortality ranges (33.5- 54%).

**Table 3: Disease syndromes related to calf mortality in farms (n = 60)**

Disease/syndrome	Mortality (%)
Diarrhea	80.1
Respiratory	10.2
Lumpy skin disease	1.3
Bloat	0.1
Nonspecific	9.2

- Of the disease syndromes recorded prior to deaths of calves, the mean mortality attributable to diarrhea was the largest (80%), followed by respiratory disorders.
- Considerable mortality was reported related to general disease syndromes (nonspecific)

# Findings and lessons

- A high calf mortality that reaches up to a loss of 25% of calves was observed in dairy farms in Ethiopia. High calf mortality seriously affects the business of the dairy farms.
- 18% calf mortality was reported in this study in Debre Zeit
- Generally, more than 64% of calf mortality occurred within one month of age and about 50% mortality occurred in the first week of life. This implies that the intervention of the project is justifiable
- Due to less-developed milk processing and marketing in Ethiopia, the sales of heifer are an important source of farm income

# Impact of training and monitoring on adoption of improved calf management practices

Practices in calf management	Participants (Adoption) n/ % n= 60	Control (Adoption) n/ % n=54	p-value
Storage of surplus Colostrum	50 (83.33%)	8 (15%)	0.01
colostrum feeding practice	52 (86.67%)	8 (14.81%)	0.01
Naval treatment	53 (88.33%)	7 (12.96%)	0.01
Application of iodine to the belly of calf after parturition	42 (70.00%)	5 (9.26%)	0.02

- This clearly describes the impact of calf management practices training and monitoring on adoption of the practices smallholder farmers*

Partial budget analysis (in ETB as of May 2020) and overall financial returns per animal unit for the first 15 months of life due to adoption of calf management improvement

<i>Benefit</i>	<i>Quantity ETB</i>	<i>Birr/ unit</i>	<i>Total</i>	<i>Costs</i>	<i>Quantity</i>	<i>Birr/ unit</i>	<i>Total</i>
<b><i>Additional revenues</i></b>				<b><i>Additional costs</i></b>			
Extra income from mature healthy heifer at 15 months	1 heifer	80,000	80,000		Rubber mat	1800	1800
<b>Costs no longer incurred</b>				Housing materials and labour	1	12,500	12,500
Purchase of acaricides and Anthelmintics	1 calf	1500	1500	Extra calf meal		1233 kg	11056
Mortalities avoided	1 calf	2000	2000	Vet service	1	1500	1500
<b>Total</b>			<b>83,500</b>				<b>25,856</b>
<b>Net income</b>			<b>57,644</b>				



# Difference in the average income between adopters and non-adopters

Category	Mean Income in ETB/animal/annum	T test
Adopter	95,065	4.6***
Non adopters/	40,918	

The observed difference in the average income between adopters and non-adopters of calf management practices consists of:

- direct effects of adoption of calf management practices through reduced risks leading cause of calf mortality
- reduction in the cost related to veterinary service and medicines, the higher daily weight gain, reduced use of other materials.

\*\* from the time a calf is born it has financial benefits to the farmer.

# Non-financial benefits

- Based on the changed perceptions toward affective welfare of the calves among the participating farmers, also biosafety, security and welfare improvements resulted from the intervention.
- These welfare benefits include:
  - increased lying time
  - improved floor cleanliness
  - better animal hygiene scores



Thank you

Contact: [danieltemesgen2011@yahoo.com](mailto:danieltemesgen2011@yahoo.com)