Technological options and approaches to improve smallholder access to desirable animal genetic material for dairy development: IPMS experience

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Introduction

- Ethiopia has about 50 million cattle (CSA, 2009/10) and about 10 million are breeder cows.
- Calving rate is about 45%; average milk production is 1.54 litres/cow/day and 82% is consumed or processed into butter at farm level
- Total annual milk production is 2.76 billion litres; and per capita milk consumption is about 16 kg/year, lower than averages for Africa (27 kg/year)
- Annually Imports USD 12 million worth of milk and milk products to fill the demand-supply variance.
- However, there is huge potential for dairy development (smallholder and commercial) due to large human and livestock population, suitable agro-ecologies, culture of milk consumption, etc.
- Smallholders are limited by a number of factors from participating in milk production and marketing. One of the major problems is lack of access to and high price of improved dairy animals.

Objectives

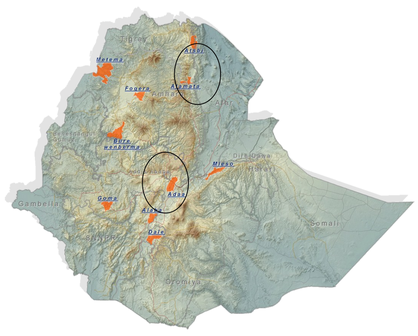
- kick-start the development of market-oriented smallholder dairy production system in selected sites
- to improve access to improved dairy genetics by smallholder farmers , and
- to test simple hormonal synchronization regime under smallholder farm conditions,

Why synchronize in the Ethiopian smallholder context?

- To produce large number & uniform animals of desired germplasm (kick start)
- To match calving with feed availability and market demand for milk and milk products
- To control oestrus period and improve the effectiveness and efficiency of AI service
- To increase the number of marginalized/endangered breeds (eg. Fogera)
- To quickly multiply breeds with specific genetic merit (eg. Sheko) and to contribute to resilience of pastoral livestock systems – re-stocking
- To mitigate environmental impact of livestock through more from less
- To help transform livestock extension system: Cows BCS, palpated, disease, NP, Prost

Materials and Methods

The first phase of this study was conducted in Tigray and Southern Nations, Nationalities and Peoples Regional States (SNNP)in Ethiopia. Two milksheds were selected:



- In Tigray—Adigrat-Mekelle Milkshed (Adigrat and Wukro districts)
- In SNNPR—The Awassa–Dilla Milkshed (Bera Tedecho Kebele of Dale District)
- Market opportunities—Awassa and Mekelle Regional Capitals
- Experience with dairy production and milk marketing
- Households with at least two cows and adequate feed resources
- Office of Agriculture and Kebele administrations involved in farmer selection
- Data entry and statistical analysis were performed using SPSS version 12 Software package.

Processes and Result

Existing AI system

- Mobile, stationary, on-call basis (urban areas)
- One technician expected to do about 300 AI per year—ranges from 50 to 1000
- Pregnancy rate of existing AI system after 1st insemination is about 27%
- Considering that only half of the pregnant cows will deliver female calves, the annual output of an AI technician is estimated at about 41 female calves
- Weak performance of the system has led to the country having only 350,000 improved dairy animals
- Problems include technical, transport, quality of semen, poor heat detection, lack of incentive, unavailability of service off-working hours (weekends, holidays, etc)

Organizational and institutional arrangements

Capacity development for Regional Teams

Community mobilization, construction of animal handling facility and selection of healthy animals with good BCS and functional corpus lutea

Actual on-farm oestrus synchronization in action

Table 1. Performance of oestrus synchronized cows in two Regional States, Ethiopia

Variables	Awasaa-Dale Milkshed		Adigrat-Mekelle Milkshed	
	No.	%	No.	%
Total animals presented for synchronization	210	-	212	-
No. animals treated with $PGF_{2\alpha}$	175	83.3	199	93.9
No. of cows that aborted	-	-	6	3.0
Final No. cows synchronized	175	100	193	97.0
No. of animals that responded to $PGF_{2\alpha}$ treatment	171	97.7	193	100.0
Animals that died (after insemination) Animas that did show up for pregnancy diagnosis	3 5	1.8 2.9	- -	- -
Interval to oestrus, hours	NA	-	45.13	-
Pregnant animals	94	57.7	119	61.7

- Six cows aborted after treatment due to early pregnancy and owners had no idea when they were bred.
- Good oestrus response due to selection of cows with good body condition and functional corpus lutea
- Some farmers were reluctant to bring their cows for pregnancy diagnosis per rectal palpation as they considered this intrusive and may damage the early fetus.
- Improved efficiency of the AI service delivery (more inseminations/AI technician).
- Pregnancy rate was about 60 %, due to proper timing of AI.
- Complements government plan on climate change and green economy (more from less) and milkshed development through smallholder farmers market-oriented dairy development
- Could be applied for genetic improvement of selected local beef cattle breeds and rehabilitation of endangered breed of multiplication of breeds with special characteristics, eg. trypanotolerance

Promotion for scaling out

- Awareness creation; field visits, workshops, publications, (leaflets, articles, case reports, etc.); DVD's, TV interviews, newspapers, engaging high level decision makers, technical staff, experts and farmers.
- Mobilizing resources, demarcation of other potential milksheds, capacity building, and technical backstopping

Conclusions and Recommendations

- It is possible to scaling-up and out in other areas where there is potential for dairy development.
- Oestrus synchronization could be implemented under smallholder farmers condition.
- Well planned and organized technological intervention with appropriate organizational and institutional arrangements is important
- Well trained and organized multi-disciplinary team (livestock science, feeds and nutrition experts, veterinarians, AI technicians, etc) and proper leadership, good planning, implementation, follow-up,
- Awareness creation, proper training, careful selection of the right farmers and animals (good BCS, free from diseases and with functional ovaries)
- Community participation involving administration, office of agriculture, local leaders, lead farmers, particularly women farmers
- Construction of proper animal handling facility at a convenient location
- Adequate supply of inputs, consumables, equipment, transport, etc.

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