

# Crossbreeding as innovation for dairy systems in the tropics

case study Amhara Region,  
Ethiopia

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Session 04.a: Livestock farming systems in emerging and developing countries: trends, roles and goals.

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## outline

- introduction
- research questions
- materials & methods
- selected results
- conclusions



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## introduction - innovation



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- idea, practice or object perceived as new to group or individual (Rogers, 1983)
- development and implementation of new ideas (Van de Ven, 1988)
- process by which knowledge is created (Hall et al., 2008)

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## introduction – why crossbreeding?



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- dairy: livelihoods of many resource-poor
- productivity = major constraint
- indigenous x exotic dairy breeds:
  - desirable traits → indigenous breeds
  - enhance production
  - improve livelihoods

(MAAIF, 2002; Mekonnen et al., 2009; Abdulai and Huffman, 2005; Nimbkar et al., 2008)

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## research questions



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- (1) motivations for crossbreeding?
- (2) how do farmers adapt crossbreeding (breeding strategy)?
- (3) does crossbreeding lead to production system changes?
- (4) does crossbreeding change smallholder dairy producers' livelihoods?

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## materials & methods I: partners and study sites



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### partners

- Amhara Regional Agricultural Research Institute (ARARI)
- International Livestock Research Institute (ILRI) Addis Ababa
- extension staff
- 62 farmers

### data collection

- February - April 2011
- 4 districts
- peri-urban farming communities
- 100km around multiplication center



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## materials & methods II – data collection



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- 62 interviews
- respondents
  - 8 years crossbreeding experience
  - local cattle before
  - 2/3 recipients F1 local x HF heifers (extension program)
  - 1/3 start AI



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## materials & methods III – data analysis



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- Statistical Analytical Software (SAS)  
(SAS Institute Inc., 2010)
  - qualitative answers
    - proc freq
  - quantitative answers
    - proc glm
    - proc means
- tested differences between 4 regions
  - significant differences only in details
  - ➔ **data not presented**

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## selected results – households and farms



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### household

- 5.65 persons (range 2-15)
- head:
  - 54 male, 8 female
  - 54 years (mean)
  - education level:
    - adult education (27%)
    - primary school (27%)
    - high school (11%)
  - off-farm employment 21%

### farm

- 2.02 ha (range 0-13.5 ha)
- crop/livestock system
- peri-urban farming communities

	herd size (TLU)		
	total herd	cross bred	local
mean	9.85	4.86	4.99
range	1.2-26.4	0-25	0-20

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## selected results – adoption, motivation and support



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adoption period	information	start	Information-implementation-period
mean (years ago)	18	13	5.5
range (years)	8-37	5-21	0-26

motivation for crossbreeding <sup>§</sup>	%
income	94
more milk	52
better reproductivity	6
better potential/higher traction power	6
act as model farm	3
selected by DADO	2

<sup>§</sup> multiple answers possible

support for crossbreeding (initiating organisation*)	%
information	81
access to AI/bull	79
vet-services	63
training	60
access crossbred heifers	37
forage seeds/grass cuttings	11
no support received	6

\* initiating organisation/person: extension: 45.16%; farmer 30.65%; livestock expert (not extension): 8.06%

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## selected results – breeding strategy



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- decisions: head
- crossbreeding level:
  - 61 % upgraded
  - 13% downgraded
- 85% recommend to other farmers

Why change breeding? §	%
increase profits	45
no other option	34
problematic management	10
level is manageable/preferred	10
breeding difficult	6
not enough information/ influenced by others	3

§ multiple answers possible

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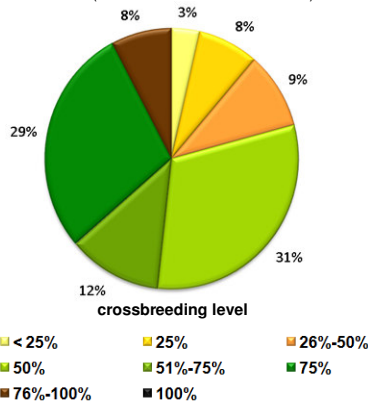
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## selected results – exotic blood levels and mating practice



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Crossbred animals (n =336) separated into crossbreeding level categories (based on farmers' estimations)



Which mating strategy do you apply for crossbreeding? §	%
AI	73
crossbred bull (other owner)	47
local bull (other owner)	34
own crossbred bull	15
bull (unspecified breed)	6
own local bull	3

§ multiple answers possible

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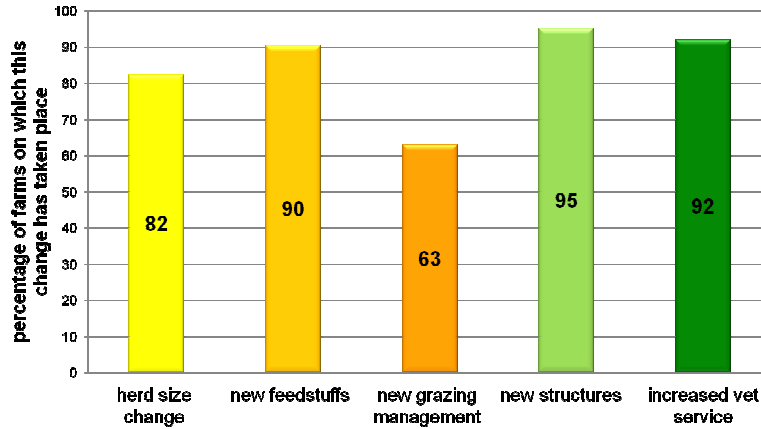
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## selected results – production system changes



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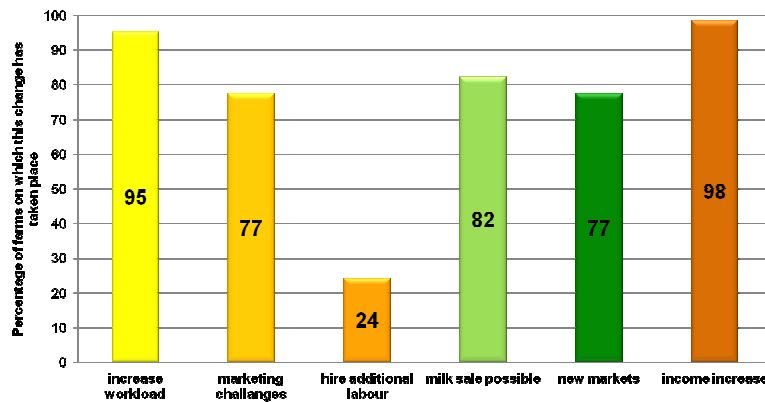
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## selected results – livelihood impacts



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## conclusions I



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- differences between regions: details only (not presented)
- majority participants crossbreeding = success
- motivation: income/milk production
- famers develop breeding:
  - improve productivity (**IF** possible)
  - often no alternative
- **inputs** AND **markets** crucial
- support system essential

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## conclusions II



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- |   |  |
|---|--|
| <p><b>high input</b></p> <ul style="list-style-type: none"> <li>➢ manpower</li> <li>➢ feed</li> <li>➢ water supply</li> <li>➢ animal health care</li> <li>➢ management level</li> </ul> | <p><b>high output</b></p> <ul style="list-style-type: none"> <li>➢ income increase</li> <li>➢ employment creation</li> <li>➢ milk market access</li> </ul> |
|---|--|
- positive livelihood impact
  - change of production system
  - suitable technology peri-urban dairy system in region

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**Thank you very much for your attention!!**

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