END OF PROJECT REVIEW

Smallholder farmers' multilevel challenges to adopt improved dairy technologies and practices

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Introduction

- Adopting improved dairy farming technologies is a key for increasing smallholder farmers' milk productivity and quality

- Many dairy technologies introduced to farmers by different development agents (e.g. dairy cooperatives, the government, universities)

    - Which technologies have been adopted by smallholder dairy farmers?
    - What are the main barriers to adopt technologies?

- The data analysis utilised cross-sectional dataset collected in the IndoDairy Smallholder Household Survey (ISHS) 2017 (n=600 farmers)

Dairy technologies at the farm level

Dairy feed

1. Use of high quality grasses
2. Use of fertiliser to grow grass
3. Improving drinking water availability
4. High protein concentrates (16% or higher)
5. Conserving forages for the dry season (hay, silage)

Milk quality enhancing

6. Improved milking hygiene to reduce TPC
7. Use of stainless steel milking equipment

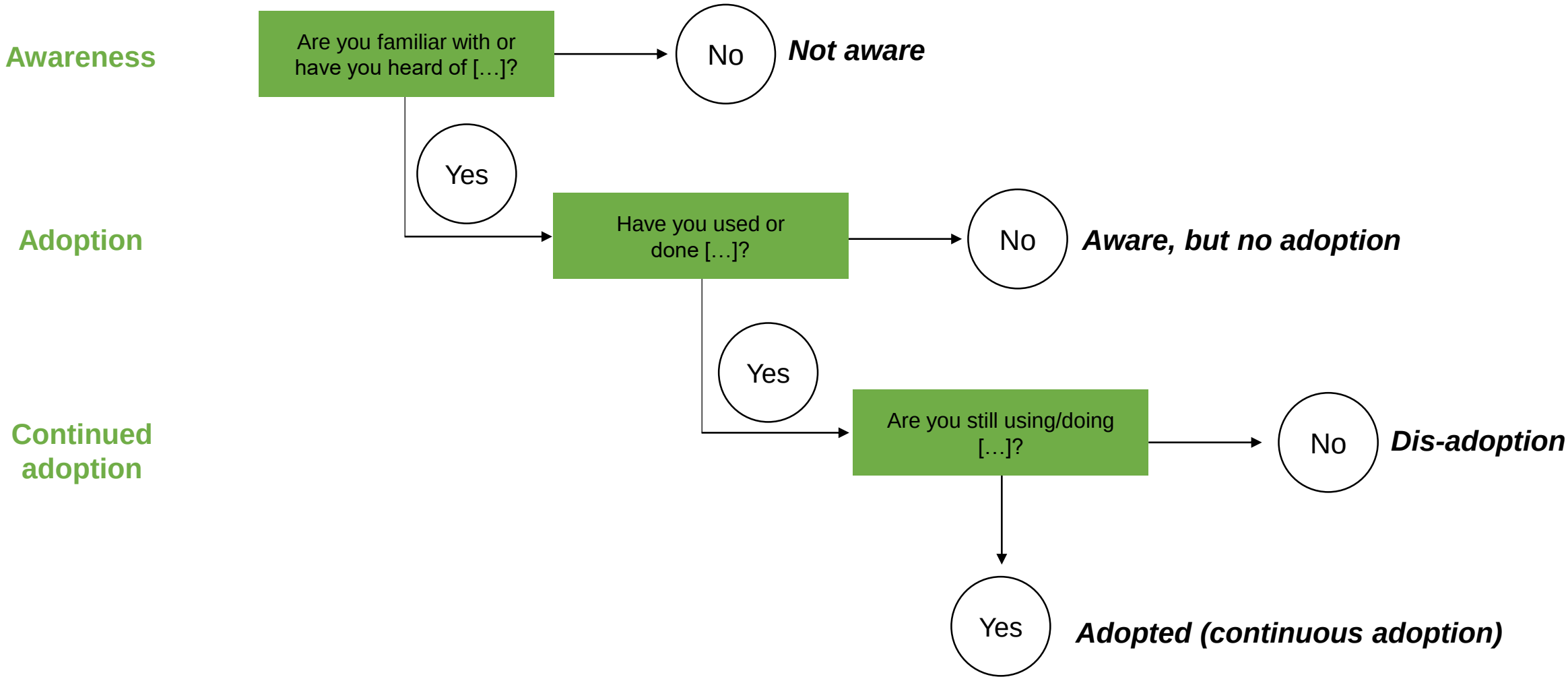
Animal health

8. Teat dipping after milking
9. Mastitis test
10. Rubber floor for barn/cage

Farm management

11. Record keeping

Framework – Adoption is a process



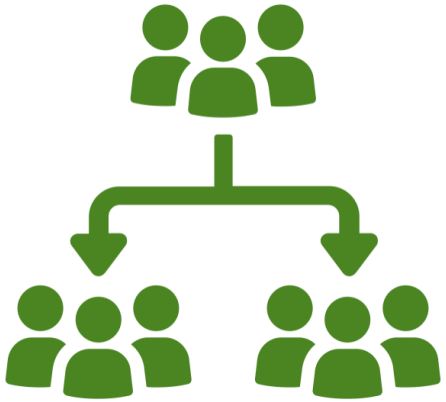
Grouping farmers based on their adoption status

Latent class cluster (LC-cluster) analysis

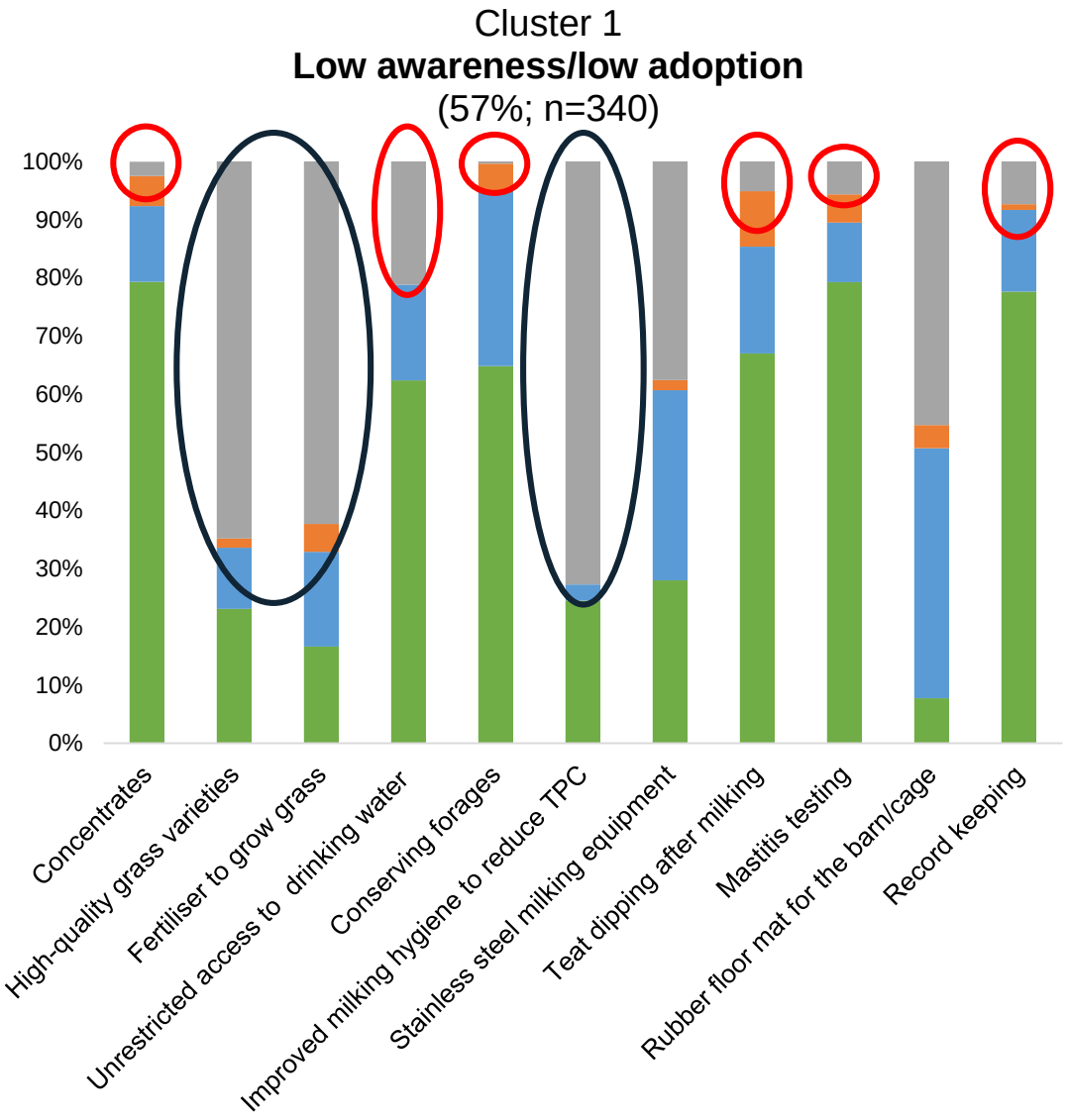
- To identify unique segments (profiles) of smallholder dairy farmers based on the adoption status on multiple dairy technologies

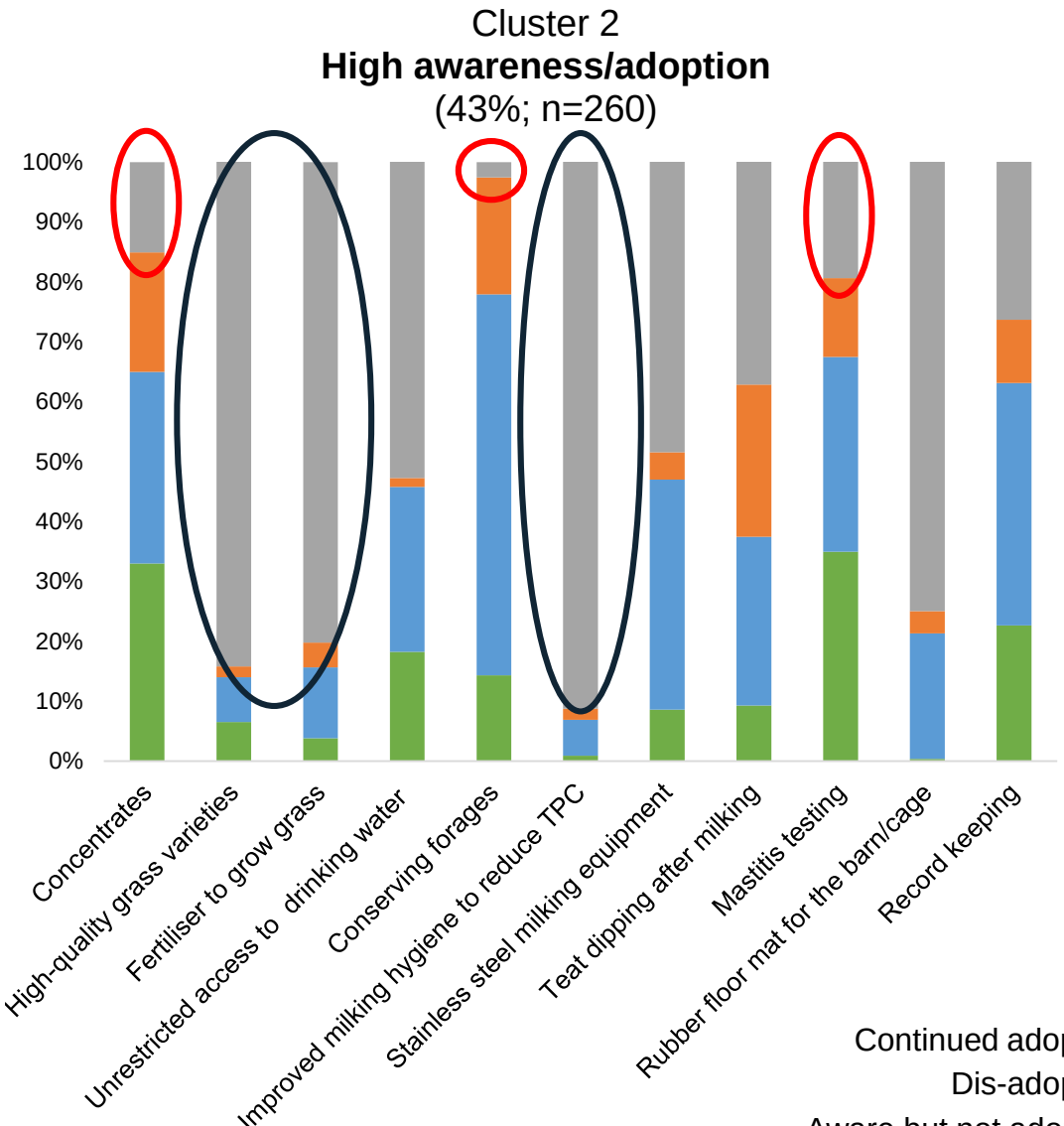
- 11 technologies adoption status:
    1. Not aware
    2. Aware, but not adoption
    3. Dis-adoption
    4. Adopt (continuous adoption)

Data analysis



Adoption profile clusters





Continued adoption
Dis-adoption
Aware but not adopted
Not aware

Indonesia's Smallholder Dairy Farmers Barriers to Technology Adoption

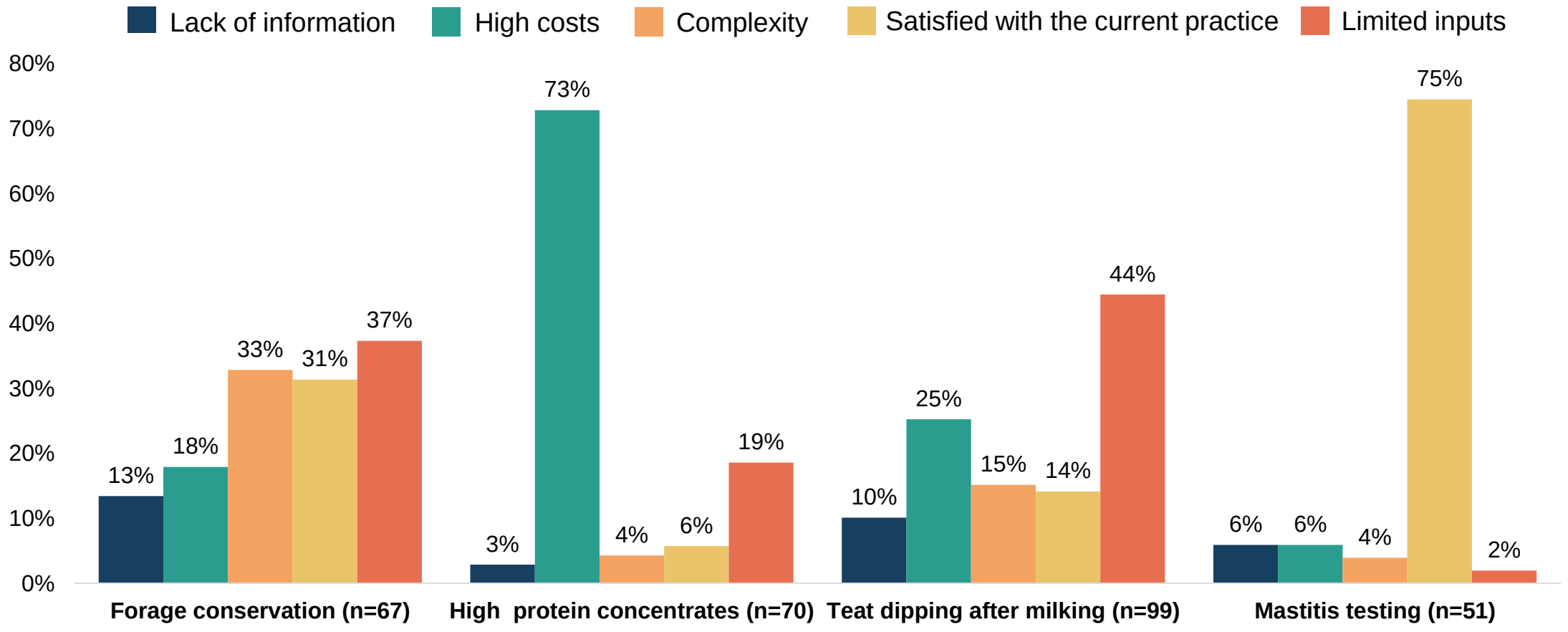
IndoDairy
Industri Susu Tangguh 2025

57% Low awareness/ low adoption		43% High awareness/ high adoption
5.7 years education		7.4 years education
4.4 cows		7.3 cows
Less aware of milk quality indicators		More aware of milk quality indicators
36.5 mins travel to KUD office		29.3 mins travel to KUD office
Less contacts with extension staff		More contacts with extension staff

Dis-adoption rates of dairy technologies

Technologies	Number of farmers that have used (a)	Number of farmers that dis-adopted (b)	Percentage of farmers dis-adopted (c = b/a*100)
Forage conservation	75	67	89%
High protein concentrates	118	70	59%
Teat dipping after milking	214	99	46%
Mastitis testing	121	51	42%

Reasons for dis-adoption



Value chain interviews with cooperative board in Dec 2017 – Jan 2018

High costs of high protein concentrates

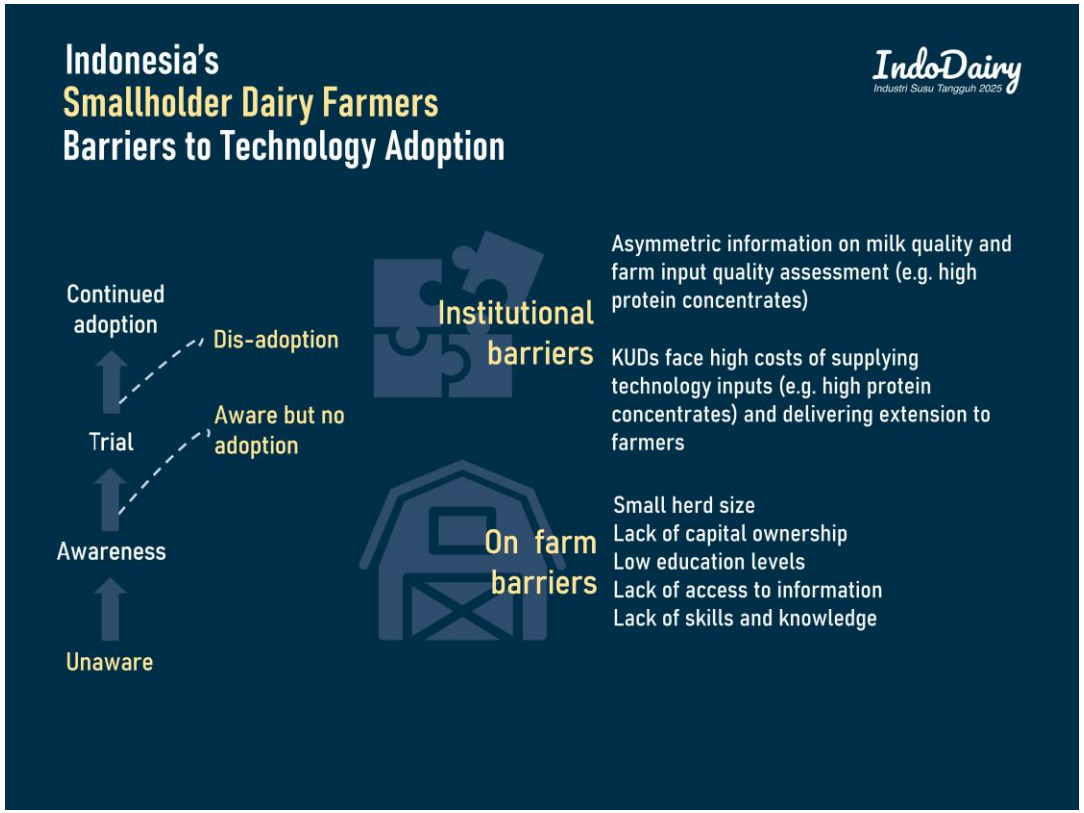
"*On the one hand, we have to make concentrates with adequate protein content for the needs of cows. On the other hand, the price is high, and it is not affordable for farmers. The problem is the price of raw materials continue to increase"* (Participant 3, Cooperative 3).

Less incentive to adopt technologies

Milk and farm input quality

- No individual incentives for farmers' milk quality and hygiene
- Input quality is not known by farmers
- No independent body to test the quality of milk and farm inputs

Conclusion and policy implications



- **Smallholder farmers' adoption decisions are varied**
  - Influenced by differences in farmers' socioeconomic characteristics, access to agricultural services, and the characteristics of the technologies
- **Multilevel barriers to adoption**
  - Farm-level: lack of individual awareness, limited capital and improved knowledge
  - Institutional level: arrangements regarding milk and input quality assessment and the provision of dairy farm inputs and services
- **Tailored agricultural extension programs and assistances**
  - Based on farmers' unique characteristics, needs, and constraints and in accordance with the characteristics of the technology being introduced
    - Implementing "reach-out" strategies to increase farmers' awareness of key technologies
    - Improving farmers' access to capital to invest in the new technologies, and training to improve farmers skills and knowledge

Thank You!

http://www.adelaide.edu.au/global-food
https://www.indodairy.net/

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