

## END OF PROJECT REVIEW



Australian Centre  
for International  
Agricultural Research



*IndoDairy*  
Industri Susu Tangguh 2025

A value chain approach to improving  
milk hygiene (activity 1.7)

Jack Hetherington  
GFAR, University of Adelaide

March 2022

# Introduction

- Milk hygiene is an important indicator of quality and is a significant issue for smallholder dairy chains in Indonesia
  - The government standard in Indonesia: Total plate count (TPC) < 1,000,000. (for reference: in Aus, this is < 50,000)
- There was a general understanding of a persistent issue, but limited data on specific hotspots.
- Farmers are not given an incentive from the market to improve the milk hygiene
  - Paid a flat price for their milk, while the cooperative (KUD) is paid a premium based on the milk quality (including TPC).
- By extending the testing and price premiums back to the farmer, a win-win could be achieved for improving farmers' livelihoods and the quality of milk throughout the chain.

# Research Objectives

- To identify sources of microbial contamination (TPC) (farm to processing plant).
  - **Hazard Analysis Critical Control Points (HACCP) study**
- To compare smallholder on-farm results to a best practice, commercial (large scale) dairy farm supplying to premium markets.
  - **Comparison with Cimory's farm** → *COVID prevented this*
- To recommend opportunities for investments in supply chain technologies and on-farm practice change to reduce microbial contamination.
  - **Feedback and training to KUD and farmers**
- Evaluate farm-level TPC information feedback and price incentives on milk quality as drivers of practice change to improve milk quality.
  - **Price incentive study**

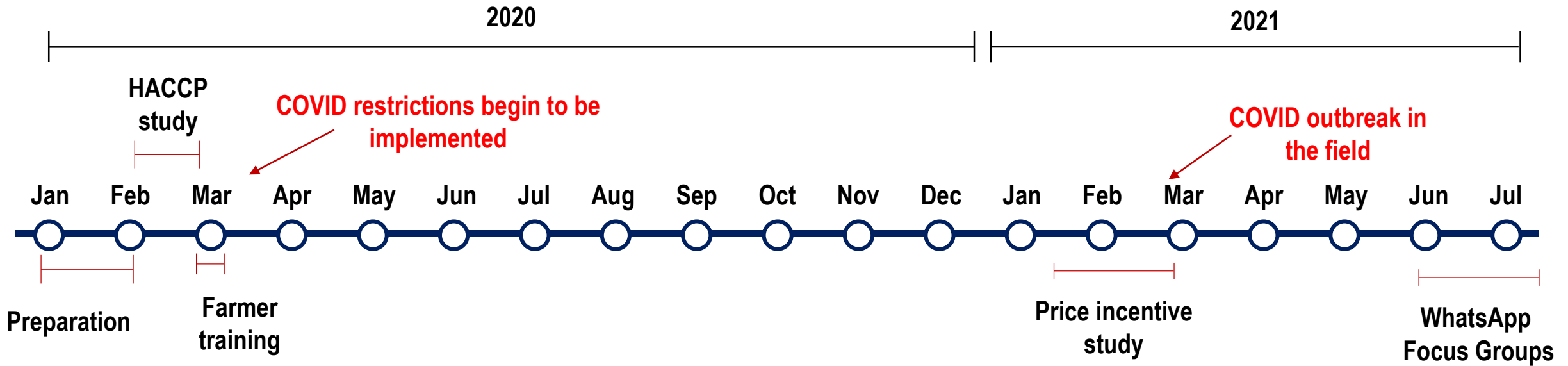
## Case study: KUD Giri Tani, Cisarua, Bogor District



KUD Members: 130 (67 active households)

Farmers, KUD and milk processor (Cimory) were enthusiastic about improving milk hygiene, but were unsure of where to begin.

# Timeline





## Hazard Analysis Critical Control Points (HACCP) Results

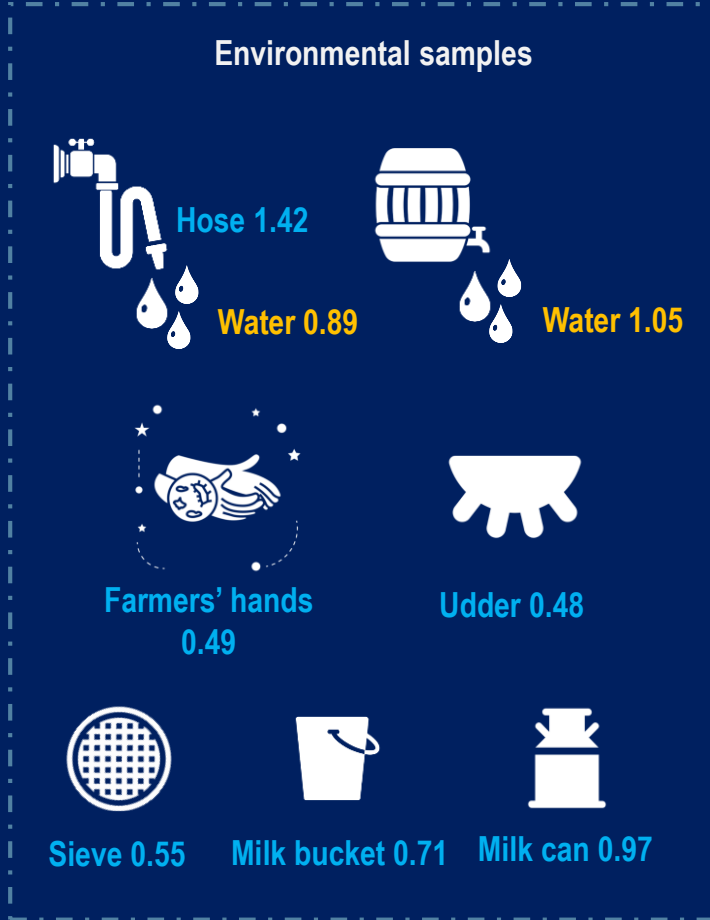


# Farm-level TPC (in millions)

20.0

Humidity 96%

Elevation 876 m



n = 26

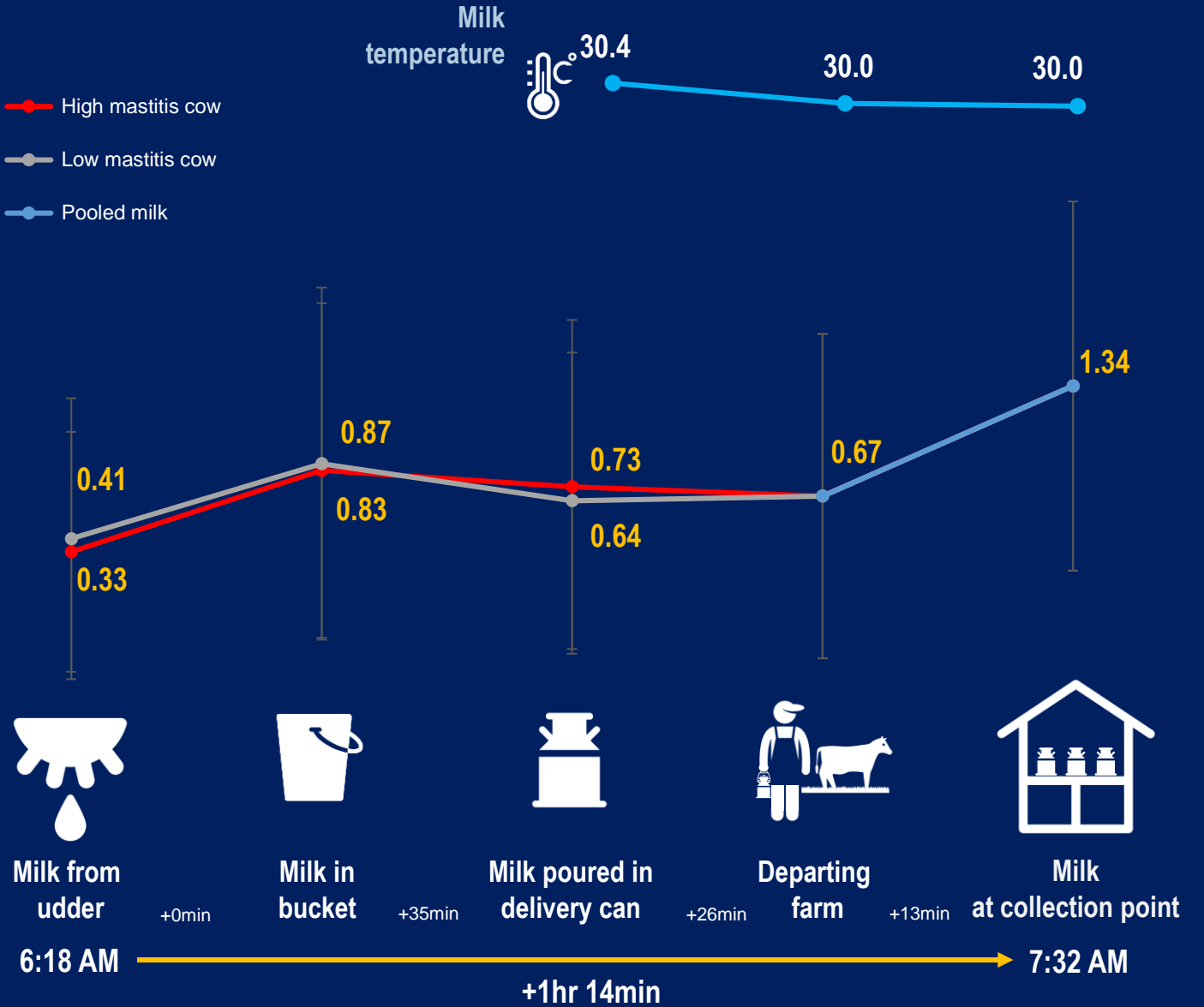
Swab sample (million cfu/cm)

Liquid sample (million cfu/ml)

### Average TPC of Milk (with SD)

- High mastitis cow
- Low mastitis cow
- Pooled milk

2.50  
2.00  
1.50  
1.00  
0.50  
0.00  
-0.50





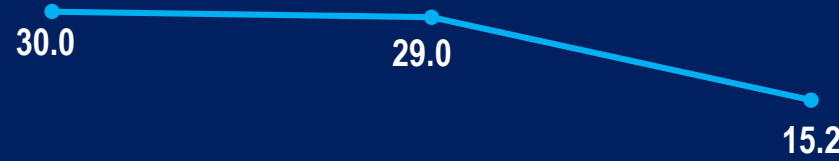
# KUD-level TPC (in millions)

20.0

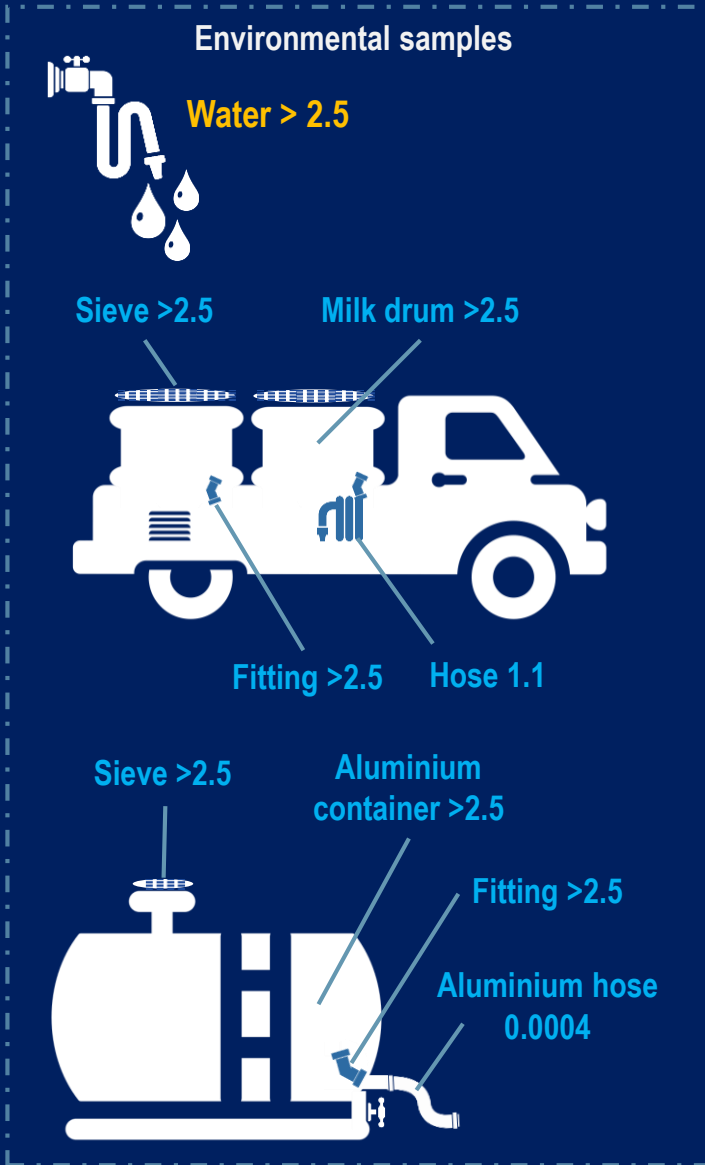
Humidity 96%

Elevation 876 m

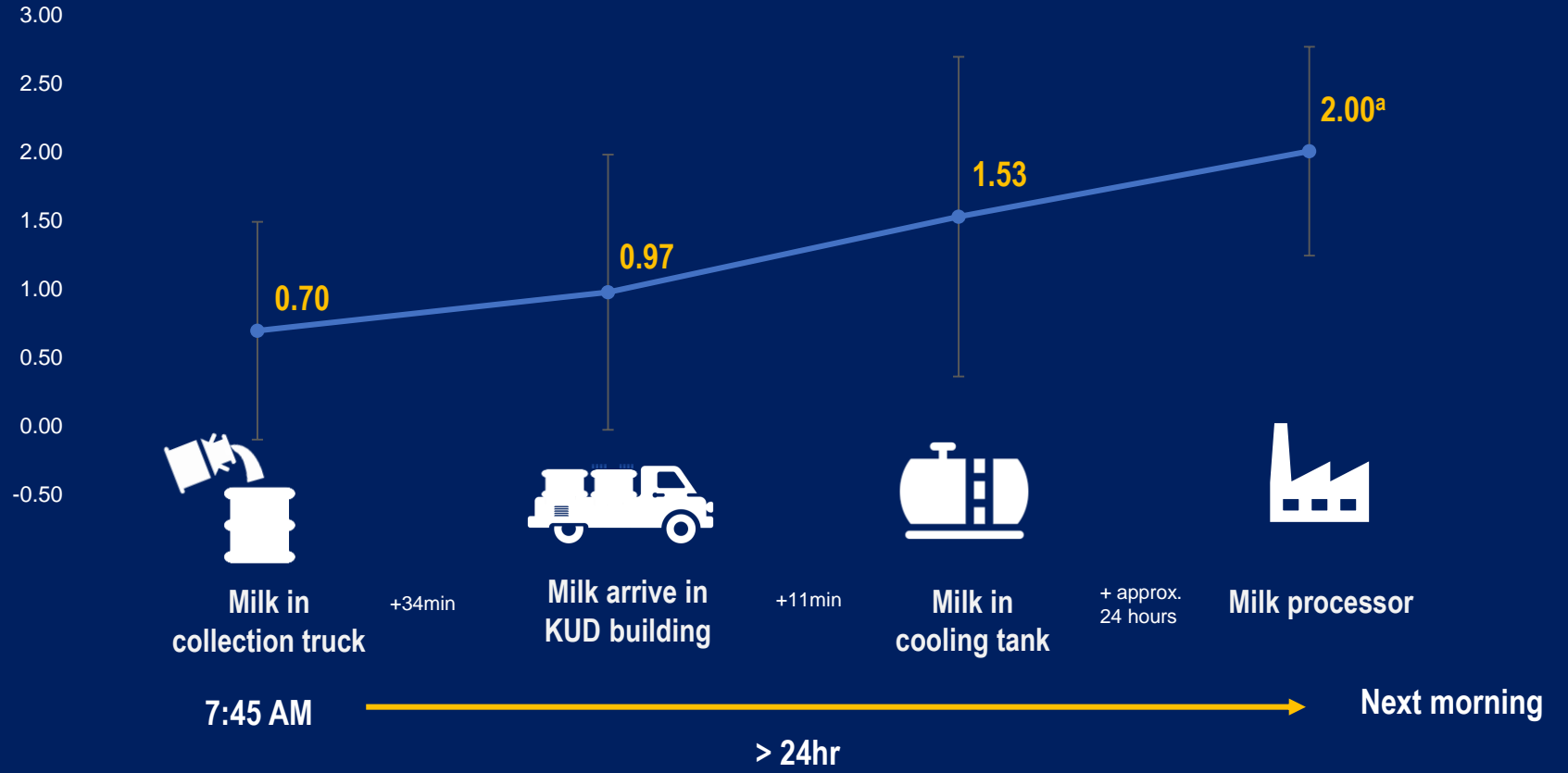
Milk temperature



NB: Temp at time of sampling, not lowest temp reached



Average TPC of Milk (with SD)



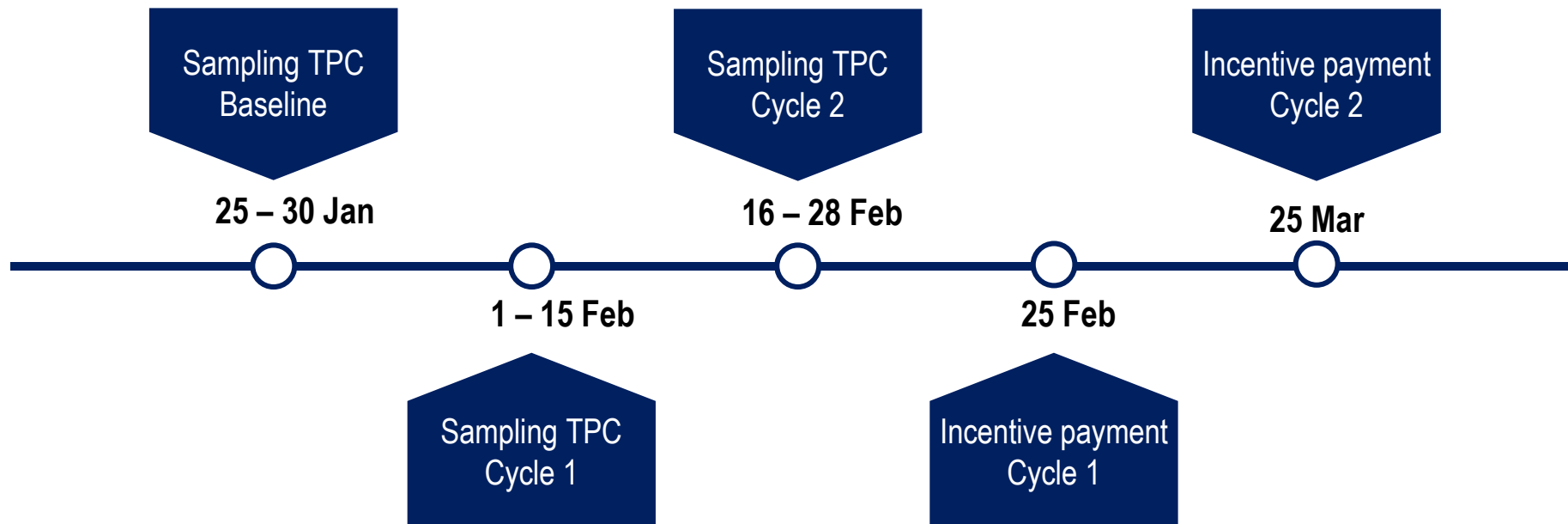
Swab sample (million cfu/cm)  
Liquid sample (million cfu/ml)  
<sup>a</sup> Results from milk processor's lab







## Price incentive study results

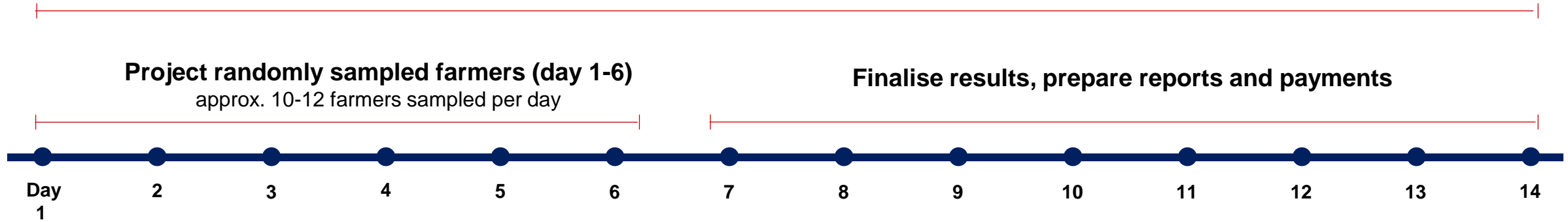


**(n = 66)**

# Price incentive study

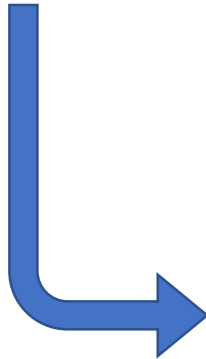
## Individual farmer sampling and premiums

### KUD payment cycle (14-15 days)



Individual samples were then assessed against this grading system.

Farmers were paid a bonus for all milk delivered during the entire payment cycle.



Grade	Base price paid by KUD (Rp/L)	Bonus paid by IndoDairy project (Rp/L)	TPC Requirements
A	5,000	1,000	< 250,000
B	5,000	750	250,000 – 500,000
C	5,000	500	500,000 – 1,000,000
D	5,000	250	1,000,000 – 1,500,000
E	5,000	0	> 1,500,000

Farmers were provided an individual report with the TPC results and feedback about how to improve their milk.

*E.g. a farmer that produces 10 litres per day delivers 140 litres over the payment cycle. During the random sampling (between day 1 and 6) if the TPC is 400,000, their milk quality is 'Grade B':*

*140 litres x Rp 750 = Rp 105,000 (approx. AU\$10.5)*

Grade

C

**REPORT LETTER**  
**IndoDairy Incentive Study**  
**Laboratory Result for Individual Farmer TPC**  
**First Cycle 1-15 Februari 2021**

Name	XXXXXXXX
Group	XXXXXXXX
Total Production (Litre) 1-15 Feb	258 Litre
TPC result (cfu/ml)	730,000 cfu/ml
Water content	5%
Milk Quality Grade	C
Incentive IndoDairy (Rp/Litre)	Rp 500
Total Incentive IndoDairy (Rp)	Rp 129,000

**Feedback**

Based on the result of milk quality test on the laboratory, your TPC was 730.000 cfu/ml, which is Grade C (500,000 – 1,000,000 cfu/ml). Therefore, you still need to improve the milk quality as follows:

- Ensure all of the milking equipment is clean and dry.
- Udder and teats should be clean and dry.
- Wash hand before milking.
- Discard the first three streaks of milk.
- Deliver milk immediately once finish milking.
- Use milk sieves to filter milk before storing to the milk can.
- Wash and the clean milk can in advance after delivery, and dry under the sun light.

**Note:**

- Do not wash the equipment immediately before milking, it can leave the water on the surface and make the milk contaminated by the water.
- Use hot water and detergent to clean the milk can to have best result of hygiene equipment.

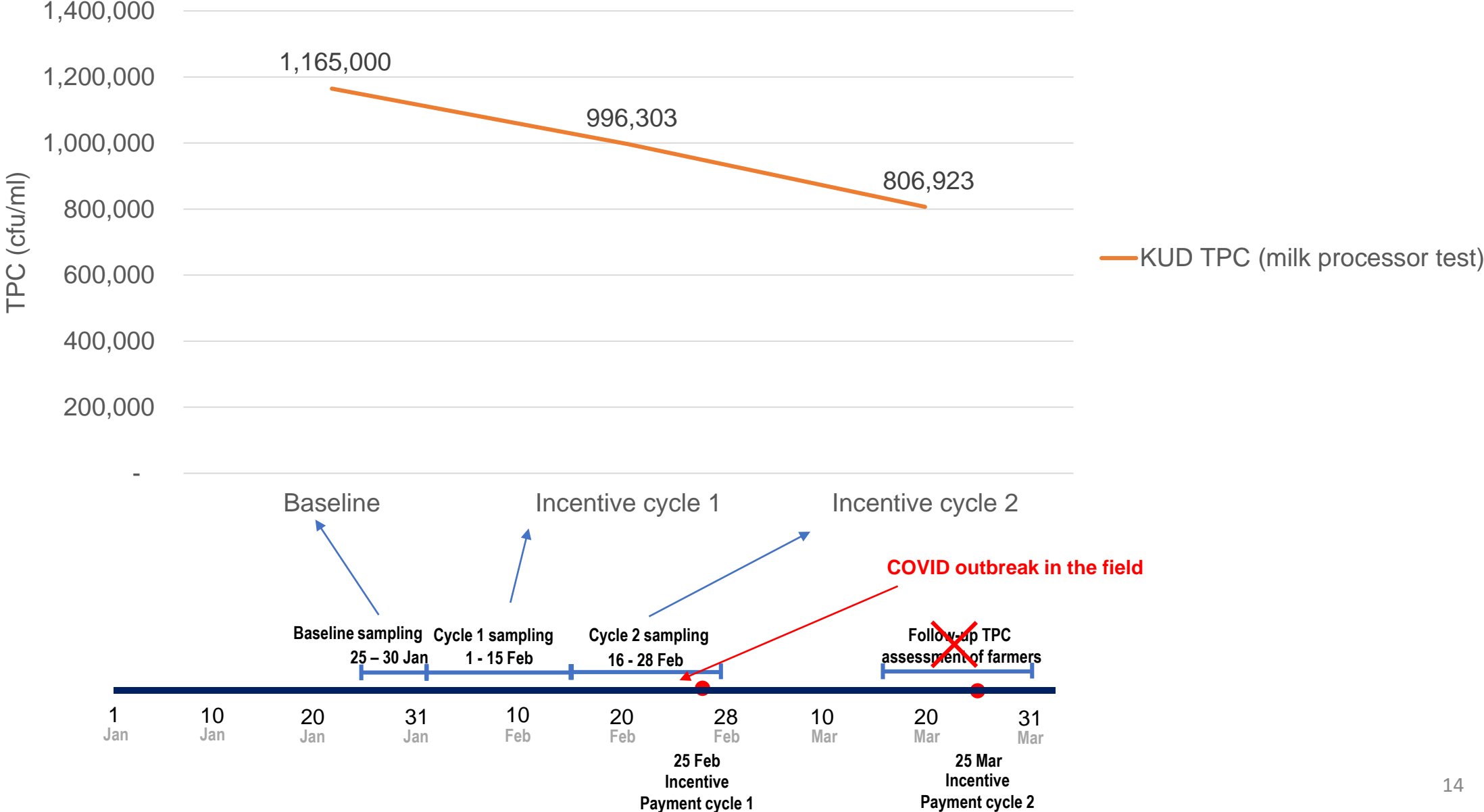
Cisarua, February 2021

IndoDairy



# Price incentive results

All milk delivered from the KUD to Cimory



# WhatsApp Focus Group feedback (June-July 2021)

'Farmer 1' in the Cisarua WhatsApp Focus Group shared this:

Diskusi Group Cisarua

21/06/2021

**Vyta Hanifa**

Alhamdulillah juga ini cerita bagus dari Pak Alwi...

Menurut Bapak, TPC yg biasanya tinggi itu sampai mencapai berapa Pak dari ...

Waktu masih belum menerapkan dari kegiatan IndoDairy pernah di uji mencapai 500 lebih kalau tidak salah, kini sesudah menerapkan dari kegiatan IndoDairy bisa mencapai 30 Alhamdulillah kemarin dari kegiatan insentif bonus masuk level A.

10:30 pm

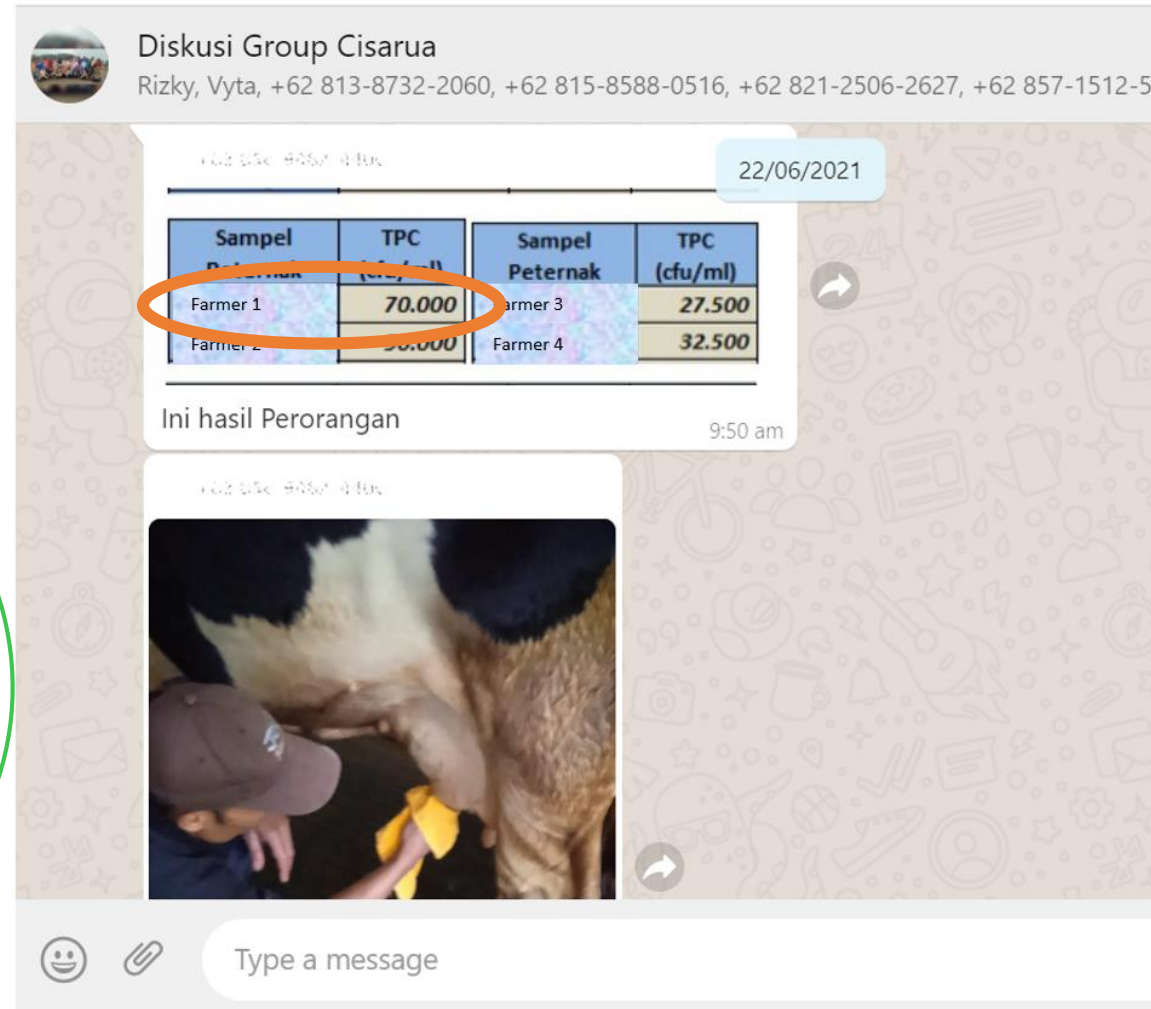
**You**

Alhamdulillah pak mukti. Apakah bisa diceritakan jg pak hasil produksk dan kualitas susunya bgmn stelah menerapkan smua praktik yg disebutkan td.

3 minggu yg lalu, pihak cimory mengadakan sempel susu dikandang sapi saya, hasilnya alhamdulillah, Tpc susu sapi saya hasil nya 70.000 ribu.

10:38 pm

*"3 weeks ago, Cimory took a milk sample from my farm, the result was good. Thank God, the TPC of my milk was 70,000 cfu/ml"*





Diskusi Group Cisarua



22/06/2021

*"This is what makes the quality of our milk better..."*



Diskusi Group Cisarua

Inilah Yang menjadikan kualitas susu kami lebih baik 😊



Type a message



22/06/2021

10:05 am



Milk sieve



22/06/2021



*"Cleaning the barn"*

Lagi bersih" Kandang

9:46 am



Type a message

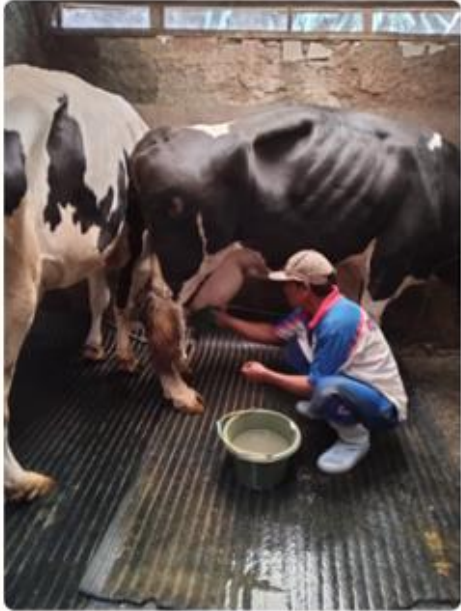






Diskusi Group Cisarua

22/06/2021



Beres p Rizki alhmdullh

7:11 nm



Diskusi Group Cisarua

22/06/2021



7:11 pm



Diskusi Group Cisarua

22/06/2021



7:11 pm

# Feedback from the KUD

Dairy farmer and KUD Giri Tani representative Mr Miftah Rahman said,

*'This study opened the eyes of the KUD board and made us realise that nothing is impossible.'*

*Previously we doubted whether the quality of milk supplied by farmers could be improved, but the results show it can be done.'*



# Conclusions

- The environment has high levels of contamination, especially the water used for cleaning. Most farmers use plastic milk buckets, no detergent and cold water when washing their equipment.
  - Some 'easy' fixes (e.g., hot water, detergent, allowing buckets to fully dry).
  - Others are more costly solutions but are once-off investments (e.g. stainless steel milk cans, on-farm cooling)
- Results from the extensions study showed that adoption of hygiene practices is not influenced by training alone.
- The price incentive study was not able to be implemented in-full.
  - Ideally, we would have like to have seen how things had changed a month after we saw implemented the incentives results – due to COVID this was not possible.
  - This should be implemented over a longer period of time to enable farmers to receive the benefits and make changes on farm and reinforce practice changes.
  - However, the study provided the foundations to implement again over a longer period of time. It allowed the team an ability to iron out a lot of operational issues with collecting and processing samples, and providing feedback to farmers.

# Policy Implications

- Reducing TPC from smallholders is achievable.
- Training and extension alone is not enough to see sustained change in milk hygiene practices.
- Supporting KUDs to implement individual farmer price incentives requires attention – further piloting over longer timeframes is a practical next step.
- Requires resourcing: lab equipment and human capital to process samples.



*“Improving the quality of milk and the development of dairy cows requires the cooperation of multiple stakeholders.”*

Pak Randy Armahedi, Dairy Service PT. Cimory



# Thank You!

<http://www.adelaide.edu.au/global-food>

<https://www.indodairy.net/>



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Your Levy at Work



IPB University  
— Bogor Indonesia —