

## Factsheet 13.2: Profitability Comparison - Individual Cow Characteristics and Farm Management Practices

### Background

In the previous factsheet, an overview of the household and farm characteristics of the farmers from IndoDairy Smallholder Household Survey (ISHS) based on profit quartiles was provided. This factsheet assesses differences in dairy cow characteristics and farm management practices by profit quartiles.

The average dairy herd size in the ISHS was 5.6 with an average 2.8 lactating cows.

### Individual cow characteristics

Individual production characteristics were recorded for every milking cow at the time of the ISHS. In total, 1,626 milking cows were registered.

Table A1 in the Appendix shows details of individual animal information. The section below summarises characteristics that were and were not different between quartiles.

#### Significant difference

The following characteristics were significantly different between profit quartiles ( $p < 0.05$ ):

##### *Daily milk production*

- As discussed in the previous factsheet, milk production per cow was significantly different between the profit quartiles.
- Quartile 4 (Q4) cows were producing significantly more milk per day (17.2 litres) compared to the other quartiles.
- Q1 cows were producing significantly less milk than other quartiles (13.8 litres).

#### No difference

The following characteristics were not significantly different between profit quartiles ( $p > 0.10$ ):

- Method of breeding
- Cow age
- Cow weight
- Parity
- Age at first calving
- Calving interval

#### Herd management

Herd management practices for cows and calves are summarised in Table A2 and A3 in the Appendix, respectively. The section below

summaries the key characteristics different between profit quartiles in relation to how farmers managed their herd.

**Significant difference**

The following characteristics were significantly different between profit quartiles ( $p < 0.05$ ):

*Timing of first colostrum feed*

- A higher proportion of Q1 farmers (least profitability) fed colostrum to their calves less than hour after parturition (65%), as compared to the other quartiles.
- However, across all four quartiles more than 90% of farmers fed colostrum within 3 hours after parturition.

**No difference**

The following characteristics were not significantly different between profit quartiles ( $p > 0.10$ ):

- Cattle housing and restraints
- Heat detection method
- Induction of oestrus method
- Amount and frequency of colostrum fed to calves
- Calf deworming

- Calf dehorning
- Age male calves are sold

**Disease occurrence in cattle**

The occurrence of cattle health issues, including calves and cows, is summarised in Figure 1 and Table A4 in the Appendix.

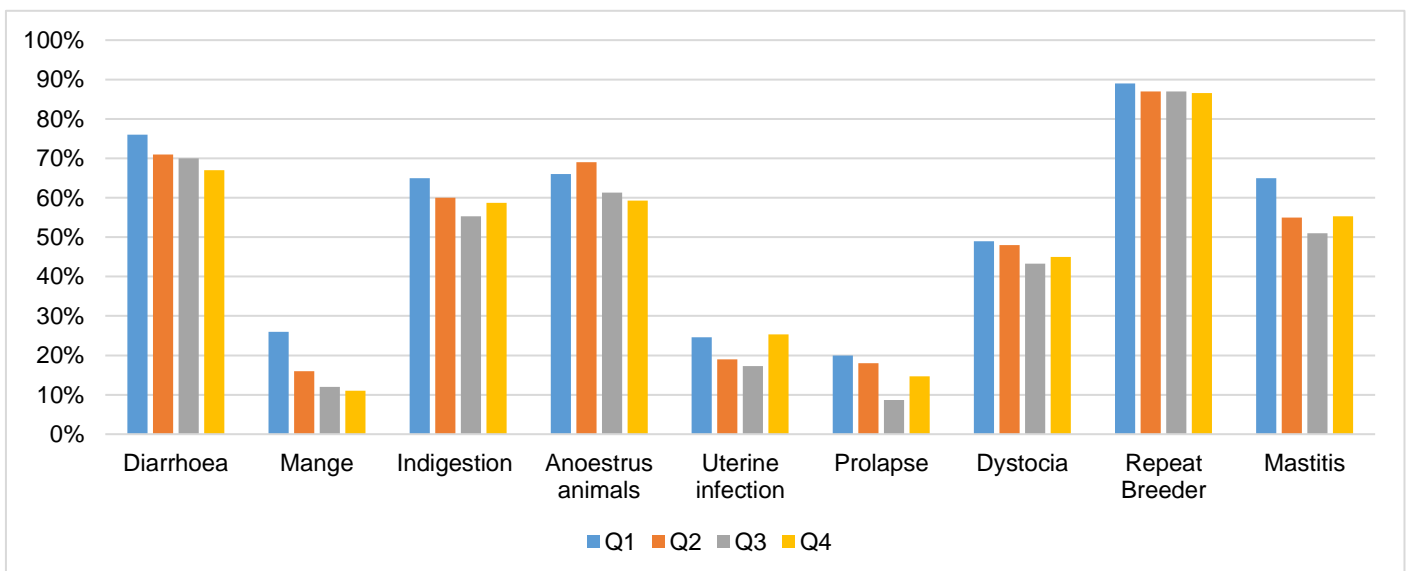
Figure 1 shows the proportion of farms that had the issue occur. In general, there was a slightly higher proportion of farms in Q1 that had the issue on their farm, as compared to Q3 and Q4. The section below summarises those that were significant.

**Significant difference**

The following characteristics were significantly different between profit quartiles ( $p < 0.05$ ):

*Mange (infection of mites)*

- A higher proportion of farmers in Q4 (most profitable) reported never having an issue with mites (89%), compared to the other quartiles.
- More Q1 farmers had an issue with mange compared to the other quartiles. However, farmers reported this as an ‘occasional’ issue.



**Figure 1.** Occurrence of disease in cattle by profit quartiles.

### **No difference**

The following characteristics were not significantly different between profit quartiles ( $p > 0.10$ ):

- Diarrhoea in calves
- Indigestion in calves
- Anoestrus animals
- Uterine infections
- Prolapse
- Dystocia
- Repeat Breeder
- Mastitis

### **Summary**

This factsheet highlighted differences between profit quartiles regarding a few animal characteristics, disease occurrence and herd practices. Key insights highlighted include:

- **Q4 (most profitable) cows were producing significantly more milk per day (17.2 litres) compared to the other quartiles while, Q1 (least profitable) cows were producing significantly less milk than other quartiles (13.8 litres).**
- **There were no significant differences across profit quartiles in method of breeding, cow age, cow weight, parity, age at first calving and calving interval.**
- **A higher proportion of Q1 farmers fed colostrum to their calves less than hour after parturition (65%), as compared to the other quartiles.**
- **There were no significant differences between quartiles in cattle housing restraints, heat induction method, induction of oestrus, amount and frequency of colostrum fed to calves, and calf deworming and dehorning.**
- **Cows in Q4 had a low prevalence of mange (infection of mites).**
- **There were no significant differences between quartiles in occurrence of**

**diarrhoea and indigestion in calves, anoestrus animals, uterine infections, prolapse, dystocia, repeat breeder and mastitis.**

The following factsheet, Factsheet 13.3, provides information on dairy farm inputs across the profit quartiles.

## **Appendix to Factsheet 13.2**

This appendix lists dairy farm management practices for the entire sample grouped by profit quartiles. Standard deviations (SD) are included where relevant.

Statistical significance between quartiles were determined using ANOVA (for binary and continuous variables) and Pearson's Chi-squared test (for categorical variables). For categorical variables with small observations ( $n < 5$ ), Fisher's exact test was used to confirm the Chi-squared test. ANOVA and Chi-squared tests results are shown in the right-hand column, under the Total. Pairwise comparisons were performed for continuous and binary variables using Tukey tests when the ANOVA test was trending towards significant ( $p < 0.10$ ). Quartiles with the same letter are not significantly different at the 5% level ( $p > 0.05$ ).

**Table A1.** Dairy cow information by profit quartile (n = 1,626).

Variable	Quartile 1			Quartile 2			Quartile 3			Quartile 4			Total		
	Value <sup>1</sup>	SD <sup>2</sup>	Sig <sup>3</sup>	Value <sup>1</sup>	SD <sup>2</sup>	Sig <sup>3</sup>	Value <sup>1</sup>	SD <sup>2</sup>	Sig <sup>3</sup>	Value <sup>1</sup>	SD <sup>2</sup>	Sig <sup>3</sup>	Value <sup>1</sup>	SD <sup>2</sup>	Sig <sup>3</sup>
Method of Breeding (n=1,626)															
<i>Artificial Insemination (AI)</i>	100.0%			100.0%			100.0%			100.0%			100.0%		
Cow age (months) (n=1,578)	60.07	24.41		61.42	25.53		60.08	23.28		59.16	22.55		60.27	24.08	
Cow weight (kg) <sup>4</sup> (n=1,571)	438.81	76.20		434.34	72.60		437.10	69.71		436.36	64.35		436.70	71.35	
Parity (n=1,616)	2.90	1.83		3.16	2.10		3.04	1.89		3.00	1.77		3.03	1.91	
Age at first calving (months) (n=1,545)	27.10	3.41		27.16	9.90		26.89	4.36		27.61	4.84		27.16	6.29	
Calving interval (months) (n=1,224)	13.60	2.47		13.63	2.53		13.55	3.53		13.57	2.58		13.59	2.81	
Daily milk production (L/cow/day) (n=1,626)	13.83	4.58	a	14.14	4.38	a	15.11	4.31		17.16	4.35		14.89	4.57	***

<sup>1</sup>Value is either percentage or mean; <sup>2</sup>SD = Standard Deviation; <sup>3</sup>Sig = Significance; <sup>4</sup>Cow weight is based on farmers' estimation; \* p < 0.10, \*\* p < 0.05 and \*\*\* p < 0.01 indicate significance at the 10%, 5% and 1% levels, respectively. Pairwise comparisons were performed for continuous and binary variables using Tukey tests when the ANOVA test was trending towards significant (p < 0.10). Quartiles with the same letter are not significantly different at the 5% level (p > 0.05).

**Table A2.** Dairy management practices by profit quartile (n = 600).

<b>Variable</b>	<b>Quartile 1 Value</b>	<b>Quartile 2 Value</b>	<b>Quartile 3 Value</b>	<b>Quartile 4 Value</b>	<b>Total Value</b>	<b>Sig<sup>1</sup></b>
Cattle housing						
<i>Offered shade part of the day</i>	0.7%	0.0%	0.0%	1.3%	0.5%	
<i>Offered shade all day</i>	4.7%	4.7%	2.0%	4.7%	4.0%	
<i>Continuously housed</i>	94.7%	95.3%	98.0%	94.0%	95.5%	
Cattle restraints						
<i>Continuously tied</i>	98.0%	100.0%	99.3%	98.7%	99.0%	
<i>Tied for part of the day</i>	0.0%	0.0%	0.7%	0.7%	0.3%	
<i>Not tied</i>	2.0%	0.0%	0.0%	0.7%	0.7%	
Heat detection						
<i>Visual</i>	100.0%	100.0%	99.3%	100.0%	99.8%	
<i>None</i>	0.0%	0.0%	0.7%	0.0%	0.2%	
Induction of oestrus						
<i>One shot of prostaglandin</i>	52.7%	51.3%	44.7%	36.7%	46.3%	
<i>Two shots of prostaglandin</i>	4.7%	6.7%	11.3%	8.0%	7.7%	
<i>None</i>	30.7%	26.0%	33.3%	37.3%	31.8%	
<i>Other</i>	12.0%	16.0%	10.7%	18.0%	14.2%	

<sup>1</sup>Sig = Significance; \* p < 0.10, \*\* p < 0.05 and \*\*\* p < 0.01 indicate significance at the 10%, 5% and 1% levels, respectively.

**Table A3.** Calves management by profit quartile.

<b>Variable</b>	<b>Quartile 1</b>	<b>Quartile 2</b>	<b>Quartile 3</b>	<b>Quartile 4</b>	<b>Total</b>	<b>Sig<sup>1</sup></b>
Timing of first colostrum feed (n = 599)						
<i>0 - 1 hour</i>	64.7%	56.0%	58.0%	55.7%	58.6%	**
<i>1 - 3 hours</i>	29.3%	42.0%	32.7%	36.9%	35.2%	**
<i>4 - 6 hours</i>	6.0%	1.3%	5.3%	5.4%	4.5%	**
<i>7 - 12 hours</i>	0.0%	0.7%	4.0%	2.0%	1.7%	**
Times colostrum is fed per day (n = 599)						
<i>Twice a day</i>	87.3%	82.0%	81.3%	83.9%	83.6%	
<i>Three times a day</i>	12.7%	18.0%	18.7%	16.1%	16.4%	
Amount of colostrum provided per feed (n = 599)						
<i>1-2 litres</i>	47.3%	42.7%	49.3%	49.7%	47.3%	
<i>3-4 litres</i>	44.7%	51.3%	45.3%	44.3%	46.4%	
<i>More than 5 litres</i>	8.0%	6.0%	5.3%	6.0%	6.3%	
Calf deworming (n = 600)	77.3%	84.0%	76.7%	77.3%	78.8%	
Age of deworming? (n = 473)						
<i>1 - 2 months</i>	1.7%	0.0%	1.7%	2.6%	1.5%	
<i>3 - 4 months</i>	8.6%	14.3%	6.1%	10.3%	9.9%	
<i>5 - 6 months</i>	69.0%	69.8%	72.2%	65.5%	69.1%	
<i>Other</i>	20.7%	15.9%	20.0%	21.6%	19.5%	
Calf dehorning (n = 600)	1.3%	2.7%	1.3%	2.7%	2.0%	
Age males calves sold (n = 600)						
<i>0 - 3 months</i>	10.0%	12.0%	14.0%	10.0%	11.5%	
<i>4 - 7 months</i>	51.3%	48.7%	45.3%	43.3%	47.2%	
<i>8 - 11 months</i>	2.7%	6.0%	7.3%	5.3%	5.3%	
<i>12 - 17 months</i>	8.7%	7.3%	8.0%	8.0%	8.0%	
<i>More than 18 months</i>	10.0%	6.0%	5.3%	4.0%	6.3%	
<i>Not sold</i>	17.3%	20.0%	20.0%	29.3%	21.7%	

<sup>1</sup>Sig = Significance \* p < 0.10, \*\* p < 0.05 and \*\*\* p < 0.01 indicate significance at the 10%, 5% and 1% levels, respectively.

**Table A4.** Disease occurrence in cattle by profit quartile (n = 600).

<b>Variable</b>	<b>Quartile 1</b>	<b>Quartile 2</b>	<b>Quartile 3</b>	<b>Quartile 4</b>	<b>Total</b>	<b>Sig<sup>1</sup></b>
Diarrhoea						
<i>Never</i>	24.0%	29.3%	30.0%	32.7%	29.0%	
<i>Occasionally</i>	56.7%	52.0%	54.0%	48.0%	52.7%	
<i>Often</i>	19.3%	18.7%	16.0%	19.3%	18.3%	
Mange						
<i>Never</i>	74.0%	84.0%	88.0%	89.3%	83.8%	***
<i>Occasionally</i>	25.3%	14.0%	11.3%	9.3%	15.0%	***
<i>Often</i>	0.7%	2.0%	0.7%	1.3%	1.2%	***
Indigestion						
<i>Never</i>	35.3%	40.0%	45.3%	41.3%	40.5%	
<i>Occasionally</i>	55.3%	50.0%	47.3%	50.0%	50.7%	
<i>Often</i>	9.3%	10.0%	7.3%	8.7%	8.8%	
Anoestrus animals						
<i>Never</i>	34.0%	30.7%	39.3%	40.7%	36.2%	
<i>Occasionally</i>	50.7%	56.7%	50.0%	49.3%	51.7%	
<i>Often</i>	15.3%	12.7%	10.7%	10.0%	12.2%	
Uterine infection						
<i>Never</i>	74.7%	80.7%	82.7%	74.7%	78.2%	
<i>Occasionally</i>	24.0%	18.0%	15.3%	25.3%	20.7%	
<i>Often</i>	1.3%	1.3%	2.0%	0.0%	1.2%	
Prolapse						
<i>Never</i>	80.0%	82.0%	90.7%	85.3%	84.5%	
<i>Occasionally</i>	19.3%	17.3%	9.3%	14.7%	15.2%	
<i>Often</i>	0.7%	0.7%	0.0%	0.0%	0.3%	
Dystocia						
<i>Never</i>	51.3%	52.0%	57.3%	55.3%	54.0%	
<i>Occasionally</i>	42.7%	43.3%	40.7%	38.7%	41.3%	
<i>Often</i>	6.0%	4.7%	2.0%	6.0%	4.7%	
Repeat Breeder						
<i>Never</i>	10.7%	12.7%	12.7%	13.3%	12.3%	
<i>Occasionally</i>	34.7%	32.7%	36.0%	42.7%	36.5%	
<i>Often</i>	54.7%	54.7%	51.3%	44.0%	51.2%	
Mastitis						
<i>Never</i>	35.3%	44.7%	49.3%	45.3%	43.7%	
<i>Occasionally</i>	56.7%	50.0%	44.7%	47.3%	49.7%	
<i>Often</i>	8.0%	5.3%	6.0%	7.3%	6.7%	

<sup>1</sup>Sig = Significance \* p < 0.10, \*\* p < 0.05 and \*\*\* p < 0.01 indicate significance at the 10%, 5% and 1% levels, respectively.