



## Factsheet 13.7: Profitability Comparison - Farmers' Attitudes, Perceptions of Change and Future Aspirations

### Background

In the previous factsheet, differences between the adoption status of various dairy farm technologies were analysed across the four profit quartiles.

This factsheet provides an overview of the differences between attitudes, perceptions of change, risk and expectations for the future by dairy farmers in West Java based on profit quartiles. This information builds upon Factsheet 13.1 and 13.2, which summarises household, farm and individual animal characteristics of the IndoDairy Smallholder Household Survey (ISHS).

### Attitudes towards adopting new technology and practices

In the ISHS, the farmers were asked what their attitudes were towards trying new technologies, management practices and production methods. Attitudes towards adopting new technology and practices were not significantly different across the profit quartiles. Majority of the farmers (59%) indicated they waited to see other's success before trying new technology and practices, which was reflected equally across the quartiles (Table A1 in the Appendix).

### Rating of prices, availability and quality of inputs and services

An aim of the ISHS was to identify how farmers perceived and rated the availability, quality and prices of essential inputs and services required for dairy farming. They also indicated how things had changed since 2014; three years prior to when the survey was conducted. The overall results of this are shown in Factsheet 10 where farmers' attitudes, future aspirations and perceptions are discussed across the four districts.

Farmers were asked how they would currently rate various aspects related to dairy farming, where: 1 = good, 0 = fair and -1 = poor.

Next farmers indicated how these aspects had changed since 2014, where: 1 = improved, 0 = no change and -1 = became worse (detailed summary statistics are provided in Table A2 and A3 in the Appendix).

The differences in current rating and perceptions of change (since 2014) across the profit quartiles are discussed below.

## Farmers' current rating of availability and quality of inputs and services

### Significant difference

The following farmers' perception ratings were significantly different between profit quartiles ( $p < 0.05$ ) on:

#### Availability of dairy nutritional information

- Overall across the quartiles, farmers agreed that availability of dairy nutritional information was fair. The level of agreement was higher amongst farmers in Q2 and Q3 as compared to farmers in Q1 and Q4.

### Slight difference

The following farmers' perception ratings trended towards significance between profit quartiles ( $p < 0.10$ ) on:

#### Prices paid by buyer for milk

- Dairy farmers in Quartile 1 (Q1) (least profitable), Quartile 2 (Q2) and Quartile 3 (Q3) perceived that the prices they received from milk buyers were poor (mean value in Table A2 is  $< 0.00$ ), while farmers in Quartile 4 (Q4) (most profitable) indicated that they were receiving fair prices from milk buyers (mean value in Table A2 is between 0.00 and 0.50).

#### Availability of extension services

- Farmers across the quartiles indicated that availability of extension services was fair. Note that level of agreement was higher amongst farmers in Q3 as compared to farmers in Q1, Q2 and Q4.

### No difference

The following farmers' perception ratings were not significantly different between profit quartiles ( $p > 0.10$ ):

#### Inputs and services rated as 'good' (mean value in Table A2 is $\geq 0.50$ )

- Availability of concentrates
- Availability of credit
- Availability of veterinary services
- Availability of veterinary medicines

#### Inputs and services rated as 'fair' (mean value in Table A2 is between 0.00 and 0.50)

- Number of milk buyers
- Quality of grass and forages
- Availability of grass and forages
- Availability of technologies to improve milk yields
- Availability of marketing information
- Roads in the district

#### Inputs and services rated as 'poor' (mean value in Table A2 is $< 0.00$ )

- Price of concentrates
- Availability of land to purchase

## Perceived change in availability and quality of inputs and services since 2014

### Slight differences

The following farmers' perception ratings trended towards significance between profit quartiles ( $p < 0.10$ ):

#### Availability of dairy nutritional information

- Farmers across the quartiles indicated that the availability of dairy nutritional information had not changed since 2014, however the level of agreement was higher in Q3 and Q4.

#### Availability of technologies to improve milk yields

- Farmers across the quartiles indicated that the availability of technologies to improve milk yields had not changed (mean value in Table A3 is  $\geq 0.00$  and  $< 0.50$ ) since 2014, however the level of agreement was higher in Q4.

### No difference

The following farmers' perception ratings were not significantly different between profit quartiles ( $p > 0.10$ ):

#### Inputs and services that have 'improved' since 2014 (mean value in Table A3 is $\geq 0.50$ )

- Roads in the district (note that farmers in Q2 indicated that the quality of roads in their district had not changed since 2014).
- Price paid by buyers for milk (note that farmers in Q1 and Q3 indicated that the price paid by buyers for milk had not changed since 2014).

*Inputs and services that have ‘not changed’ since 2014 (mean value in Table A3 is between 0.00 and 0.50)*

- Number of milk buyers
- Availability of concentrates
- Availability of marketing information
- Availability of credit
- Availability of veterinary services
- Availability of veterinary medicines
- Availability of extension services

*Inputs and services that have ‘worsened’ since 2014 (mean value in Table A3 is < 0.00)*

- Price of concentrates
- Availability of land to purchase
- Availability of grass and forages
- Farmers in Q1 indicated that quality of grass and forages had become worse (mean value in Table A3 is < 0.00) since 2014, while farmers in Q2, Q3 and Q4 perceive that quality of grass and forages had not changed since 2014.

### **Perceived changes in farming characteristics in the past 12 months**

Farmers were asked to indicate their perceptions of change in farming characteristics in the past 12 months. The results of the overall sample are shown in Table A4 in the Appendix. A breakdown by profit quartiles is shown in Table A5 in the Appendix.

**Overall, 45% of households indicated that total income received for milk sales had decreased in the past 12 months, while 22% indicated that milk sales had increased.**

Differences between profit quartiles are discussed below.

#### ***Slight difference***

The following farmers’ perception ratings trended towards significance between profit quartiles ( $p < 0.10$ ):

*Total income received from milk sales*

- Half of the farmers in Q1 (50%) and Q2 (52%) indicated that income they received from milk sales had been reduced in the past 12 months, 44% farmers in Q4 indicated the same.

*Total number of milking cows*

- Higher number of farmers in Q4 (39%) indicated a decrease in total number of milking cows as compared to Q1 (33%), Q2 (33%) and Q3 (21%).

*Total household family labour in dairy business (male)*

- While there was no significant change in male household labour across the quartiles, farmers in Q1 indicated to a slight increase (1%) since the previous year while farmers in Q4 did not report any changes.

#### ***No difference***

The following farmers’ perception ratings were not significantly different between profit quartiles ( $p > 0.10$ ):

- Total number of dairy cattle
- Total average milk produced per day
- Total household family labour in dairy business (female)
- Total household family labour in dairy business

### **Perceived change in household financial situation (compared to 2014)**

The change in household financial situation is shown in Table A6 in the Appendix. This gives us a broad overview of changes experienced by households that have had an impact on their financial situation and perceived reasons for these changes.

**Overall, about 50% of farmers felt their financial situation had become somewhat or much better, while 16% indicated that it had become somewhat or much worse.**

The primary reasons indicated for changes in the household financial situation were changes in non-dairy livestock income (25%), non-farm income (21%) and changes in milk yields (20%).

While there were no significant differences between the profit quartiles with regards to reasons of change, compared to other quartiles a large share of farmers from Q3 (29%) and Q4 (26%) indicated they had experienced a change in non-dairy livestock income, while farmers in Q2 (26%) had experienced change in non-farm income.

### **Farmers' aspirations**

Respondents were asked about their future aspirations for their dairy farming operations. The results are presented in Table A7 in the Appendix.

**90% of farmers intended to expand their dairy farm operations.**

- 10% of Q1 farmers indicated they intended to remain the same, while this was reported by only 5% farmers in Q4.
- With regards to future herd size, farmers in Q1 expected their herd size to grow to 14.4 cows while farmers in Q4 expected it to grow to 9.7 cows.
- Less than 2% of farmers across the profit quartiles intend to quit dairy farming in the future.

**Table 1.** Current and future dairy farm herd size.

| Quartiles  | Current herd size | Desired future herd size |
|------------|-------------------|--------------------------|
| Quartile 1 | 7.39              | 14.43                    |
| Quartile 2 | 5.56              | 10.75                    |
| Quartile 3 | 5.23              | 10.75                    |
| Quartile 4 | 4.34              | 9.76                     |

Note in both Q1 and Q4, the proportional increase that farmers expected was more than twice as much as their current herd size, which was 7.3 cows in Q1 and 4.3 cows in Q4. This is illustrated in Table 1.

### **Training needs**

In order to support the farmers with training that would help them achieve their ambitions for dairy farming, the farmers were asked to identify the areas they would like to receive training to improve dairy production practices. These results are shown in Table A8 in the Appendix.

As seen previously in Factsheet 10, **dairy farmers indicated a strong desire for training to increase their capacity in animal husbandry (33%), cattle nutrition and feed management (21%) and farm business management (18%).**

There were no significant differences across the quartiles with regards to preferred methods of training, with field practice as the majority choice of farmers.

### **Significant constraints faced by farmers**

The training areas identified by farmers are further reflected in their answers when asked about significant constraints to the dairy industry from the dairy farmer's perspectives (results shown in Table A9 in the Appendix).

**The top constraint identified by dairy farmers was adequate feed resources (27%).**

There were no significant differences across the quartiles with regards to significant constraints faced by farmers.

### **Summary**

- **Overall, price of concentrates and availability of land to purchase were perceived to be poor by dairy farmers. Farmers indicated that since 2014, the price of concentrates, availability of land to purchase, and the availability and quality of grass and forages had all worsened.**

- **Farmers in Q1 perceived that milk prices they received from buyers were 'poor' as compared to farmers in Q4 who perceived milk prices to be fair.**
- **Farmers in Q1 and Q3 indicated that prices they received from buyers had not changed since 2014 while, farmers in Q2 and Q4 pointed towards an improvement.**
- **There were no significant differences across the profit quartiles with regards to farmers' perceptions of change in availability and quality of inputs and services since 2014, perceptions of changes in farming characteristics in past 12 months, perceptions of changes in household financial situation since 2014, farmers' aspirations, training needs and significant constraints faced by farmers.**

The following factsheet, Factsheet 13.8, discusses the differences between quartiles in regard to aspects of gender inclusiveness in decision-making, ownership of assets and access to credit.

## **Appendix to Factsheet 13.7**

This appendix provides a summary attitudes, perceptions of change, risk and expectations for the future by dairy farmers 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.** Farmers' attitudes towards trying new technologies, management practices and/or production methods grouped by quartiles (n=600).

| Variable   | Quartile 1 | Quartile 2 | Quartile 3 | Quartile 4 | Total | Sig <sup>1</sup> |
|--|------------|------------|------------|------------|-------|------------------|
| Attitudes towards trying new technologies new management practices and new production methods: |            |            |            |            |       |                  |
| <i>Always the first</i>  | 11.3%      | 6.7%       | 8.0%       | 9.3%       | 8.8%  |                  |
| <i>One of the first</i>  | 19.3%      | 18.0%      | 20.0%      | 18.0%      | 18.8% |                  |
| <i>Wait to see other's success before I try them</i>   | 56.7%      | 60.0%      | 62.0%      | 56.7%      | 58.8% |                  |
| <i>One of the last</i>   | 8.0%       | 11.3%      | 5.3%       | 8.7%       | 8.3%  |                  |
| <i>Never try new technologies</i>  | 4.7%       | 4.0%       | 4.7%       | 7.3%       | 5.2%  |                  |

<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 A2.** Farmers' perceptions of current situation with respect to prices and quality or availability of inputs and services (1= good, 0 = fair, -1 = poor).

| Variable  | Quartile 1         |                 |                  | Quartile 2         |                 |                  | Quartile 3         |                 |                  | Quartile 4         |                 |                  | Total              |                 | 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> | Value <sup>1</sup> | SD <sup>2</sup> |                  |
| Prices paid by buyer for milk (n=600)                       | -0.10              | 0.77            | a                | -0.01              | 0.64            | ab               | -0.03              | 0.74            | ab               | 0.13               | 0.74            | b                | 0.00               | 0.73            | *                |
| Number of milk buyers(n=519)                                | 0.19               | 0.65            |                  | 0.22               | 0.62            |                  | 0.17               | 0.56            |                  | 0.25               | 0.60            |                  | 0.21               | 0.61            |                  |
| Price of concentrates (n=598)                               | -0.63              | 0.55            |                  | -0.58              | 0.55            |                  | -0.52              | 0.61            |                  | -0.61              | 0.58            |                  | -0.58              | 0.57            |                  |
| Quality of grass and forages (n=599)                        | 0.34               | 0.63            |                  | 0.33               | 0.63            |                  | 0.31               | 0.67            |                  | 0.35               | 0.63            |                  | 0.33               | 0.64            |                  |
| Availability of land to purchase (n=587)                    | -0.45              | 0.74            |                  | -0.52              | 0.68            |                  | -0.40              | 0.76            |                  | -0.50              | 0.69            |                  | -0.47              | 0.72            |                  |
| Availability of grass and forages(n=599)                    | -0.06              | 0.80            |                  | -0.01              | 0.77            |                  | 0.07               | 0.82            |                  | 0.05               | 0.76            |                  | 0.01               | 0.79            |                  |
| Availability of concentrates (n=599)                        | 0.69               | 0.50            |                  | 0.67               | 0.47            |                  | 0.69               | 0.53            |                  | 0.61               | 0.57            |                  | 0.67               | 0.52            |                  |
| Availability of dairy nutritional information (n=557)       | 0.20               | 0.68            | a                | 0.38               | 0.57            | a                | 0.39               | 0.62            | a                | 0.25               | 0.62            | a                | 0.30               | 0.63            | **               |
| Availability of technologies to improve milk yields (n=573) | 0.21               | 0.69            |                  | 0.41               | 0.63            |                  | 0.30               | 0.67            |                  | 0.31               | 0.61            |                  | 0.31               | 0.66            |                  |
| Availability of marketing information (n=546)               | 0.12               | 0.69            |                  | 0.14               | 0.67            |                  | 0.25               | 0.68            |                  | 0.15               | 0.65            |                  | 0.16               | 0.67            |                  |
| Availability of credit (n=588)                              | 0.61               | 0.62            |                  | 0.66               | 0.52            |                  | 0.68               | 0.56            |                  | 0.59               | 0.59            |                  | 0.63               | 0.58            |                  |
| Availability of veterinary services (n=599)                 | 0.75               | 0.51            |                  | 0.83               | 0.39            |                  | 0.83               | 0.45            |                  | 0.77               | 0.45            |                  | 0.79               | 0.45            |                  |
| Availability of veterinary medicines (n=584)                | 0.68               | 0.52            |                  | 0.71               | 0.49            |                  | 0.73               | 0.49            |                  | 0.73               | 0.48            |                  | 0.71               | 0.49            |                  |
| Availability of extension services (n=596)                  | 0.28               | 0.78            | a                | 0.31               | 0.77            | a                | 0.46               | 0.67            | a                | 0.24               | 0.80            | a                | 0.32               | 0.76            | *                |
| Roads in your district (n=600)                              | 0.21               | 0.82            |                  | 0.20               | 0.84            |                  | 0.14               | 0.79            |                  | 0.18               | 0.87            |                  | 0.18               | 0.83            |                  |

<sup>1</sup>Value is a mean; <sup>2</sup>SD = Standard Deviation; <sup>3</sup>Sig = Significance; \* 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 A3.** Dairy farmers' perceptions of changes (compared to 2014) in prices and quality or availability of inputs and services (1= increased, 0= no change and -1= decrease).

| 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> |
| Price paid by buyer for milk (n=594)                        | 0.44               | 0.68            |                  | 0.60               | 0.60            |                  | 0.48               | 0.71            |                  | 0.59               | 0.67            |                  | 0.53               | 0.67            |                  |
| Number of milk buyers(n=591)                                | 0.08               | 0.28            |                  | 0.05               | 0.21            |                  | 0.04               | 0.20            |                  | 0.08               | 0.27            |                  | 0.06               | 0.24            |                  |
| Price of concentrates (n=593)                               | -0.59              | 0.53            |                  | -0.69              | 0.49            |                  | -0.57              | 0.56            |                  | -0.63              | 0.60            |                  | -0.62              | 0.55            |                  |
| Quality of grass and forages (n=594)                        | -0.07              | 0.44            |                  | 0.01               | 0.47            |                  | 0.02               | 0.50            |                  | 0.00               | 0.49            |                  | -0.01              | 0.48            |                  |
| Availability of land to purchase (n=586)                    | -0.39              | 0.53            |                  | -0.42              | 0.52            |                  | -0.39              | 0.53            |                  | -0.43              | 0.56            |                  | -0.41              | 0.54            |                  |
| Availability of grass and forages (n=598)                   | -0.23              | 0.63            |                  | -0.19              | 0.61            |                  | -0.21              | 0.63            |                  | -0.17              | 0.66            |                  | -0.20              | 0.63            |                  |
| Availability of concentrates (n=595)                        | 0.22               | 0.47            |                  | 0.29               | 0.47            |                  | 0.18               | 0.48            |                  | 0.27               | 0.53            |                  | 0.24               | 0.49            |                  |
| Availability of dairy nutritional information(n=552)        | 0.16               | 0.42            | a                | 0.18               | 0.41            | a                | 0.28               | 0.47            | a                | 0.25               | 0.47            | a                | 0.22               | 0.44            | *                |
| Availability of technologies to improve milk yields (n=566) | 0.25               | 0.51            | a                | 0.28               | 0.50            | a                | 0.29               | 0.50            | a                | 0.39               | 0.49            | a                | 0.30               | 0.50            | *                |
| Availability of marketing information (n=557)               | 0.13               | 0.36            |                  | 0.11               | 0.36            |                  | 0.09               | 0.34            |                  | 0.19               | 0.41            |                  | 0.13               | 0.37            |                  |
| Availability of credit (n=583)                              | 0.25               | 0.57            |                  | 0.34               | 0.50            |                  | 0.28               | 0.51            |                  | 0.32               | 0.56            |                  | 0.30               | 0.54            |                  |
| Availability of veterinary services (n=596)                 | 0.42               | 0.52            |                  | 0.44               | 0.52            |                  | 0.46               | 0.54            |                  | 0.44               | 0.52            |                  | 0.44               | 0.53            |                  |
| Availability of veterinary medicines (n=583)                | 0.27               | 0.47            |                  | 0.29               | 0.48            |                  | 0.27               | 0.46            |                  | 0.39               | 0.49            |                  | 0.30               | 0.48            |                  |
| Availability of extension services (n=593)                  | 0.15               | 0.66            |                  | 0.21               | 0.64            |                  | 0.31               | 0.61            |                  | 0.16               | 0.68            |                  | 0.21               | 0.65            |                  |
| Roads in your district (n=599)                              | 0.50               | 0.65            |                  | 0.42               | 0.75            |                  | 0.50               | 0.66            |                  | 0.50               | 0.74            |                  | 0.48               | 0.70            |                  |

<sup>1</sup>Value is a mean; <sup>2</sup>SD = Standard Deviation; <sup>3</sup>Sig = Significance; \* 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 A4.** Changes at the dairy household level in the past 12 months (n=600).

| Variable   | Increased | No change | Decreased | N/A <sup>1</sup> |
|--|-----------|-----------|-----------|------------------|
| Total income received for milk sales                     | 21.8%     | 32.8%     | 45.2%     | 0.2%             |
| Total number of dairy cattle                             | 33.2%     | 29.8%     | 37.0%     | 0.0%             |
| Total number of milking cows                             | 14.2%     | 54.2%     | 31.7%     | 0.0%             |
| Total average milk produced per day                      | 18.5%     | 36.3%     | 45.0%     | 0.2%             |
| Total household family labour in dairy business (male)   | 0.5%      | 96.5%     | 1.5%      | 1.5%             |
| Total household family labour in dairy business (female) | 0.0%      | 92.8%     | 0.7%      | 6.5%             |
| Total household family labour in dairy business          | 0.3%      | 76.3%     | 0.5%      | 22.8%            |

<sup>1</sup>N/A = Not Applicable.



**Table A5.** Changes at the dairy household level in the past 12 months, grouped by quartiles (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> |
|--|-------------------|-------------------|-------------------|-------------------|--------------|------------------------|
| Total income received for milk sales                     |                   |                   |                   |                   |              |                        |
| <i>Increased</i>   | 20.0%             | 17.3%             | 26.0%             | 24.0%             | 21.8%        | *                      |
| <i>No change</i>   | 29.3%             | 30.7%             | 39.3%             | 32.0%             | 32.8%        | *                      |
| <i>Decreased</i>   | 50.0%             | 52.0%             | 34.7%             | 44.0%             | 45.2%        | *                      |
| <i>N/A</i>   | 0.7%              | 0.0%              | 0.0%              | 0.0%              | 0.2%         | *                      |
| Total number of dairy cattle                             |                   |                   |                   |                   |              |                        |
| <i>Increased</i>   | 34.7%             | 30.0%             | 36.7%             | 31.3%             | 33.2%        |                        |
| <i>No change</i>   | 25.3%             | 29.3%             | 34.0%             | 30.7%             | 29.8%        |                        |
| <i>Decreased</i>   | 40.0%             | 40.7%             | 29.3%             | 38.0%             | 37.0%        |                        |
| <i>N/A</i>   |                   |                   |                   |                   |              |                        |
| Total number of milking cows                             |                   |                   |                   |                   |              |                        |
| <i>Increased</i>   | 12.7%             | 13.3%             | 17.3%             | 13.3%             | 14.2%        | *                      |
| <i>No change</i>   | 54.0%             | 54.0%             | 61.3%             | 47.3%             | 54.2%        | *                      |
| <i>Decreased</i>   | 33.3%             | 32.7%             | 21.3%             | 39.3%             | 31.7%        | *                      |
| <i>N/A</i>   |                   |                   |                   |                   |              |                        |
| Total average milk produced per day                      |                   |                   |                   |                   |              |                        |
| <i>Increased</i>   | 16.7%             | 14.7%             | 22.7%             | 20.0%             | 18.5%        |                        |
| <i>No change</i>   | 34.7%             | 36.0%             | 42.7%             | 32.0%             | 36.3%        |                        |
| <i>Decreased</i>   | 48.0%             | 49.3%             | 34.7%             | 48.0%             | 45.0%        |                        |
| <i>N/A</i>   | 0.7%              | 0.0%              | 0.0%              | 0.0%              | 0.2%         |                        |
| Total household family labour in dairy business (male)   |                   |                   |                   |                   |              |                        |
| <i>Increased</i>   | 1.3%              | 0.0%              | 0.7%              | 0.0%              | 0.5%         | *                      |
| <i>No change</i>   | 96.7%             | 96.0%             | 98.0%             | 95.3%             | 96.5%        | *                      |
| <i>Decreased</i>   | 1.3%              | 2.7%              | 1.3%              | 0.7%              | 1.5%         | *                      |
| <i>N/A</i>   | 0.7%              | 1.3%              | 0.0%              | 4.0%              | 1.5%         | *                      |
| Total household family labour in dairy business (female) |                   |                   |                   |                   |              |                        |
| <i>Increased</i>   | 88.7%             | 94.7%             | 95.3%             | 92.7%             | 92.8%        |                        |
| <i>No change</i>   | 1.3%              | 0.0%              | 0.7%              | 0.7%              | 0.7%         |                        |
| <i>Decreased</i>   | 10.0%             | 5.3%              | 4.0%              | 6.7%              | 6.5%         |                        |
| <i>N/A</i>   |                   |                   |                   |                   |              |                        |
| Total household family labour in dairy business          |                   |                   |                   |                   |              |                        |
| <i>Increased</i>   | 0.7%              | 0.0%              | 0.7%              | 0.0%              | 0.3%         |                        |
| <i>No change</i>   | 70.7%             | 82.7%             | 78.0%             | 74.0%             | 76.3%        |                        |
| <i>Decreased</i>   | 0.7%              | 1.3%              | 0.0%              | 0.0%              | 0.5%         |                        |
| <i>N/A</i>   | 28.0%             | 16.0%             | 21.3%             | 26.0%             | 22.8%        |                        |

<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 A6.** Change in household financial situation since 2014, grouped by quartiles.

| Variable  | Quartile 1 | Quartile 2 | Quartile 3 | Quartile 4 | Total | Sig <sup>1</sup> |
|---|------------|------------|------------|------------|-------|------------------|
| Change in household financial situation since 2014 (n=600)  |            |            |            |            |       |                  |
| <i>Much better</i>  | 20.7%      | 20.0%      | 26.7%      | 19.3%      | 21.7% |                  |
| <i>Somewhat better</i>                                      | 25.3%      | 28.7%      | 22.7%      | 34.7%      | 27.8% |                  |
| <i>No difference</i>  | 32.0%      | 38.7%      | 34.7%      | 31.3%      | 34.2% |                  |
| <i>Somewhat worse</i>                                       | 20.0%      | 10.7%      | 15.3%      | 12.7%      | 14.7% |                  |
| <i>Much worse</i>   | 2.0%       | 1.3%       | 0.0%       | 2.0%       | 1.3%  |                  |
| <i>No opinion or N/A</i>                                    | 0.0%       | 0.7%       | 0.7%       | 0.0%       | 0.3%  |                  |
| Reasons for change in household financial situation (n=393) |            |            |            |            |       |                  |
| <i>Change in milk prices</i>                                | 11.8%      | 7.7%       | 12.4%      | 7.8%       | 9.9%  |                  |
| <i>Change in milk yield</i>                                 | 24.5%      | 22.0%      | 12.4%      | 20.4%      | 19.9% |                  |
| <i>Change in dairy cattle price</i>                         | 2.0%       | 0.0%       | 2.1%       | 0.0%       | 1.0%  |                  |
| <i>Change in livestock (non-dairy) income<sup>2</sup></i>   | 20.6%      | 23.1%      | 28.9%      | 26.2%      | 24.7% |                  |
| <i>Change in non-farm income<sup>3</sup></i>                | 20.6%      | 26.4%      | 15.5%      | 23.3%      | 21.4% |                  |
| <i>Change in family size</i>                                | 2.0%       | 3.3%       | 3.1%       | 3.9%       | 3.1%  |                  |
| <i>Household member found a new job</i>                     | 2.0%       | 0.0%       | 3.1%       | 2.9%       | 2.0%  |                  |
| <i>Household member lost a job</i>                          | 0.0%       | 0.0%       | 1.0%       | 0.0%       | 0.3%  |                  |
| <i>Expenses associated with illness</i>                     | 1.0%       | 1.1%       | 0.0%       | 0.0%       | 0.5%  |                  |
| <i>Expenses associated with education</i>                   | 3.9%       | 1.1%       | 3.1%       | 1.9%       | 2.5%  |                  |
| <i>Member of household passed away</i>                      | 1.0%       | 0.0%       | 0.0%       | 1.0%       | 0.5%  |                  |
| <i>Other</i>  | 10.8%      | 15.4%      | 18.6%      | 12.6%      | 14.3% |                  |

<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; <sup>2</sup>Non-dairy livestock income includes income derived from sale of cattle.

<sup>3</sup>Non-farm income includes income derived from off-farm activities like wage employment, self-employment, pensions, remittances, and trading businesses.

**Table A7.** Future aspiration of farmers with respect to dairy farm operations, grouped by quartiles.

| Variable   | Quartile 1 | Quartile 2 | Quartile 3 | Quartile 4 | Total | Sig <sup>1</sup> |
|--|------------|------------|------------|------------|-------|------------------|
| Future aspiration of farmers with respect to dairy farm operations (n=600) |            |            |            |            |       |                  |
| <i>Remain the same</i>   | 10.0%      | 9.3%       | 8.0%       | 4.7%       | 8.0%  |                  |
| <i>Expand</i>  | 86.7%      | 88.7%      | 90.0%      | 92.7%      | 89.5% |                  |
| <i>Undecided</i>   | 0.7%       | 0.7%       | 0.7%       | 0.7%       | 0.7%  |                  |
| <i>Quit</i>  | 1.3%       | 0.0%       | 0.7%       | 0.7%       | 0.7%  |                  |
| <i>Other</i>   | 1.3%       | 1.3%       | 0.7%       | 1.3%       | 1.2%  |                  |
| Expected future herd size (no. of cows) (n=540)                            | 14.43      | 10.75      | 10.75      | 9.76       | 11.39 | *                |

<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 A8.** Training requirements and expectations of dairy farmers, grouped by quartiles.

| Variable  | Quartile 1 | Quartile 2 | Quartile 3 | Quartile 4 | Total | Sig <sup>1</sup> |
|---|------------|------------|------------|------------|-------|------------------|
| Willingness to participate in a farmer training day/workshop in village (n=600)           | 92.7%      | 90.0%      | 91.3%      | 94.7%      | 92.2% |                  |
| Willingness of female members of household to attend farmer training day/workshop (n=600) | 72.0%      | 70.0%      | 75.3%      | 76.7%      | 73.5% |                  |
| Preferred method of training (n=575)  |            |            |            |            |       |                  |
| <i>Seminar</i>  | 18.1%      | 14.2%      | 21.7%      | 17.7%      | 17.9% |                  |
| <i>Theory / written material</i>  | 2.8%       | 10.6%      | 4.2%       | 5.4%       | 5.7%  |                  |
| <i>Field practice</i>   | 62.5%      | 59.6%      | 58.0%      | 56.5%      | 59.1% |                  |
| <i>Farm visit</i>   | 16.7%      | 15.6%      | 16.1%      | 20.4%      | 17.2% |                  |
| Preferred areas of training (n=1437) <sup>1</sup>   |            |            |            |            |       |                  |
| <i>Nutrition / feeding management</i>   | 20.6%      | 25.1%      | 19.9%      | 20.2%      | 21.4% |                  |
| <i>Animal husbandry</i>   | 32.9%      | 32.4%      | 32.1%      | 32.9%      | 32.6% |                  |
| <i>Reproduction</i>   | 11.7%      | 10.7%      | 9.9%       | 11.1%      | 10.9% |                  |
| <i>Milking practice / management</i>  | 12.5%      | 14.1%      | 15.6%      | 14.0%      | 14.1% |                  |
| <i>Farm business management</i>   | 18.7%      | 14.4%      | 19.0%      | 19.7%      | 18.0% |                  |
| <i>Other</i>  | 3.6%       | 3.4%       | 3.4%       | 2.2%       | 3.1%  |                  |

<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; For preferred areas of training, farmers could select up to three options.

**Table A9.** Dairy farmers' perceptions of significant constraints facing the dairy industry.

| Variable   | Quartile 1 | Quartile 2 | Quartile 3 | Quartile 4 | Total | Sig <sup>1</sup> |
|--|------------|------------|------------|------------|-------|------------------|
| Significant constraints to dairy industry from the dairy farmer's perspective (n=1067) |            |            |            |            |       |                  |
| <i>Knowledge</i>   | 6.5%       | 7.9%       | 9.5%       | 12.3%      | 9.1%  |                  |
| <i>Training</i>  | 4.6%       | 4.1%       | 5.7%       | 7.2%       | 5.4%  |                  |
| <i>Quality animals</i>   | 11.9%      | 16.5%      | 13.7%      | 14.4%      | 14.2% |                  |
| <i>Feed resources</i>  | 29.1%      | 26.6%      | 26.3%      | 24.2%      | 26.5% |                  |
| <i>Availability of vet services</i>  | 0.8%       | 1.5%       | 1.5%       | 0.4%       | 1.0%  |                  |
| <i>Marketing</i>   | 4.6%       | 2.3%       | 3.8%       | 3.3%       | 3.5%  |                  |
| <i>Nutrition</i>   | 3.5%       | 3.8%       | 2.3%       | 4.7%       | 3.6%  |                  |
| <i>Labour</i>  | 5.8%       | 4.1%       | 5.0%       | 2.9%       | 4.4%  |                  |
| <i>Reproduction</i>  | 4.2%       | 5.6%       | 5.0%       | 4.7%       | 4.9%  |                  |
| <i>Calf rearing</i>  | 0.0%       | 1.1%       | 0.4%       | 0.4%       | 0.5%  |                  |
| <i>Other</i>   | 29.1%      | 26.6%      | 26.7%      | 25.6%      | 27.0% |                  |

<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; Farmers could select up to three constraints. The figures in this table represent a proportion of all constraints identified by farmers (n=1067).