



### Factsheet 13.4: Profitability Comparison - Dairy Farm Labour

#### Background

In the previous factsheet, differences between dairy farm inputs were analysed across the four profit quartiles. In this factsheet, the characteristics of the IndoDairy Smallholder Household Survey (ISHS) based on profit quartiles will be further explored, focusing on aspects of dairy farm labour.

#### Labour sources

The dairy farmers were asked about the main sources of labour they use on the dairy farm. Figure 1 shows the main sources and distribution of labour on dairy farms by profit quartile. Results are also shown in Table A1 in the Appendix.

#### Significant difference

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

#### Main sources of labour:

- 31% of farmers in Quartile 4 (Q4) (most profitable) indicated themselves to be the only source of labour on their farm while in Quartile 1 (Q1), 22% of farmers reported themselves as the only source of labour on their farm.

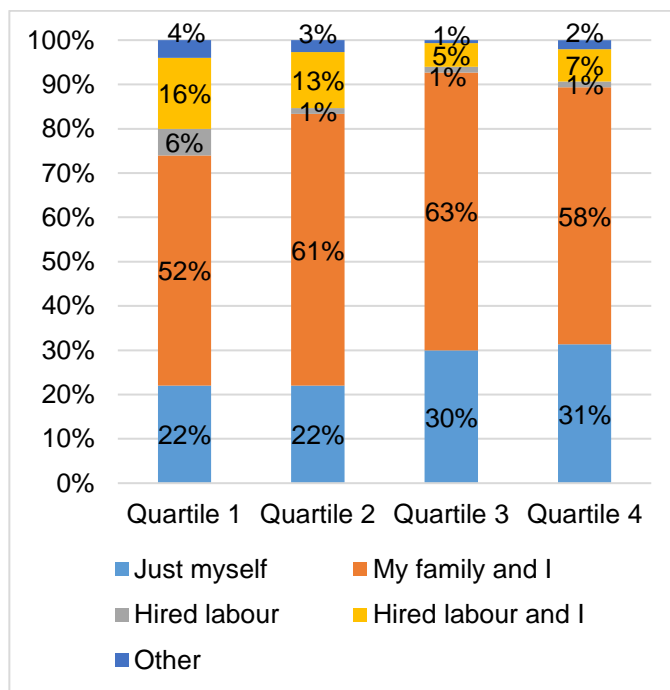


Figure 1. Main sources of labour on dairy farm.

- The number of farmers hiring labourers to work on the dairy farm was higher in Q1 (6%) compared to just 1% in Q2, Q3 and Q4.
- 16% of farmers in Q1 reported that along with hired labour, they themselves were also working on the dairy farm. This was

seen in less than half of the farmers in Q4 (7%).

- Farmers in Q1 reported the highest share of hired labour in the past 12 months with 37% compared to 11% in Q4.

**Daily wage rates:**

- Farmers in Q1 were paying the highest daily wage rates at IDR 48,503 which was equivalent to USD 3.30, while farmers in Q4 were paying IDR 45,280 which equals to USD 3.13.
- Farmers in Q2 were paying the lowest daily wage rates at IDR 43,909 equivalent to USD 3.03.

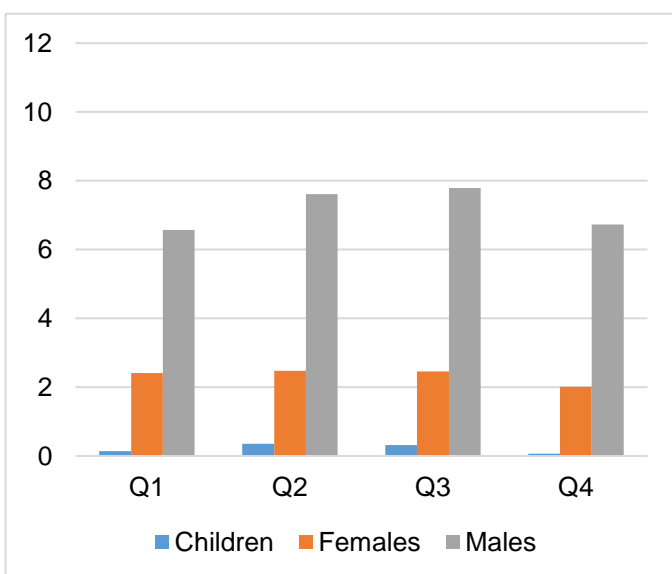
**No difference**

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

- Common method of payment to hired labour
- Ease of finding labour in local area

**Family and Employed Labour**

The number of hours dairy farmers or hired labour spend on dairy farm is an important determinant of productivity and relates to the cost of dairy farm operations.



**Figure 2.** Family labour hours on dairy farm.

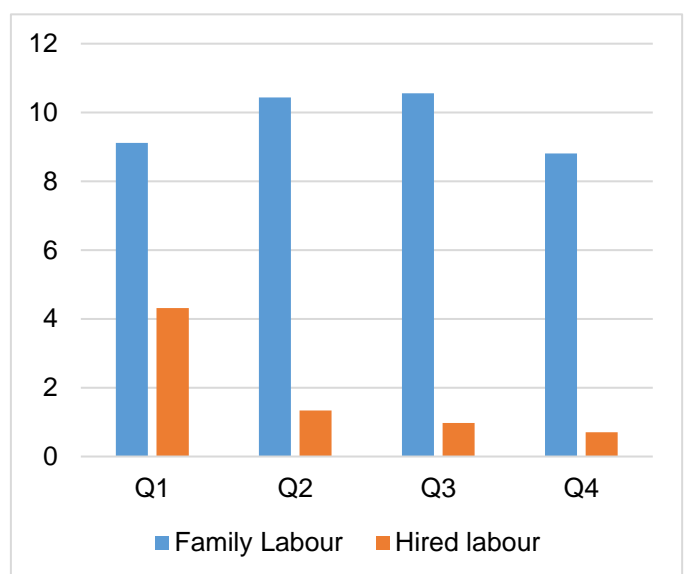
The dairy farmers were asked to think about the different activities undertaken on the dairy farm on a daily basis and how long it took every day to complete each activity. The respondents were asked to think about this for each type of labour like the dairy farmer himself, his family or the hired labour. Table A2 in the Appendix shows results based for profit quartiles.

Figure 2 and 3 below show the total number of hours each type of labour spends on the dairy farm operations.

**Significant difference**

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

- Households in Q1 (9.1 hours) and Q4 (8.8 hours) contributed similar amounts of family labour to their dairy farms. This was less than what households in Q2 (10.4 hours) and Q3 (10.6 hours) contributed.
- **Farmers in Q1 employed significantly more labour (4.3 hours per day)** compared to Q4 (0.7 hours), Q3 (1.0 hours) and Q4 (1.3 hours).



**Figure 3.** Comparison of family and hired labour hours on dairy farm.

### **No difference**

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

- Number of hours spent by females on dairy farms

### **Time spent on dairy farming activities**

Dairy farm owners and hired labour collectively spent significant amount of time on the farm in various activities. The amount of time both owners and hired labour spent on different activities were examined across the four profit quartiles. The results are summarised in Table A2 in the Appendix.

### **Significant difference**

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

#### *Collecting forages*

- Across the profit quartiles, households spent more time on collecting publicly available grass (4.3 hours), as compared to hired labour (1.0 hours).
- Hired labour in Q1 spent more time (2.2 hours) cutting and carrying grass as compared to hired labour in Q4 (0.4 hours).

#### *Milking*

- With regards to milking cows, hired labour in Q1 spent significantly more time (0.61 hours) than hired labour in Q2 (0.13 hours), Q3 (0.11 hours) and Q4 (0.05 hours).

#### *Milk handling (filtering and packing)*

- Hired labour in Q4 did not spend a single minute (0.00 hours) handling milk, including activities like filtering and packing, while hired labour in Q1 spent (0.04 hours) on the same activity.

#### *Milk delivery*

- Similarly, the amount of time spent by Q1 hired labour on delivering milk was less

(0.11 hours) compared to that by hired labour in Q4 (0.03 hours).

- Q4 dairy farm owners spent more time (0.57 hours) delivering milk compared to dairy farm owners in Q1 (0.46 hours).

### **Summary**

- **Collectively the dairy farm owner and family members were the main source of labour on dairy farm.**
- **The share of farmers hiring labour to work on dairy farm was higher amongst farmers in the first quartile compared to that in the fourth quartile.**
- **Farmers in Q1 paid the highest wage rates as compared to farmers in Q2, Q3 and Q4.**
- **Cutting and carrying grass took up significant amount of time for hired labour and dairy farm owners.**

The following factsheet, Factsheet 13.5, discusses the differences between milk production, price and quality across the profit quartiles.

## **Appendix to Factsheet 13.4**

The tables included in this appendix provide summary statistics related to labour inputs at the dairy household level for the entire sample.

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 ( $p < 0.1$ ). Quartiles with the same letter are not significantly different at the 5% level ( $p > 0.05$ ).

**Table A1.** Dairy farm labour statistics.

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>
Main source of labour (n=600)															
<i>Just myself</i>	22.0%			22.0%			30.0%			31.3%			26.3%		***
<i>My family and I</i>	52.0%			61.3%			62.7%			58.0%			58.5%		***
<i>Hired labour</i>	6.0%			1.3%			1.3%			1.3%			2.5%		***
<i>Hired labour and I</i>	16.0%			12.7%			5.3%			7.3%			10.3%		***
<i>Other</i>	4.0%			2.7%			0.7%			2.0%			2.3%		***
Total litres per labour unit (thousand L/person/year)															
	7.65	4.45	a	9.01	5.15	ab	10.12	6.63	b	12.07	5.55		9.71	5.72	***
Hired labour in the past 12 months? (n=600)															
	36.7%			24.0%		b	14.7%		ab	11.3%		a	21.7%		***
Number of people currently hired (n=130)															
	1.91	1.57	a	1.33	0.68	a	1.45	1.06	a	1.35	0.79	a	1.60	1.22	*
Employed labour daily rate (n=600)															
<i>IDR</i>	48,504	19,108		43,910	17,119		47,036	21,021		45,281	18,867		46,183	19,111	***
<i>USD<sup>4</sup></i>	3.30	1.32		3.03	1.18		3.25	1.45		3.13	1.30		3.19	1.32	
Common payment methods (n=600)															
<i>Only cash</i>	65.3%			71.3%			63.3%			61.3%			65.3%		
<i>Cash and meals</i>	32.0%			28.0%			34.7%			37.3%			33.0%		
<i>Cash, meals and milk</i>	1.3%			0.0%			0.7%			0.0%			0.5%		
<i>Other</i>	1.3%			0.7%			1.3%			1.3%			1.2%		
Ease of finding local labour (n=600)															
<i>Easy</i>	16.7%			16.7%			20.7%			14.0%			17.0%		
<i>Somewhat easy</i>	19.3%			18.7%			11.3%			18.0%			16.8%		
<i>Difficult</i>	64.0%			64.7%			68.0%			68.0%			66.2%		

<sup>1</sup>Value is either percentage or mean; <sup>2</sup>SD = Standard Deviation; <sup>3</sup>Sig = Significance; \* p < 0.1, \*\* 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 < 0.1). Quartiles with the same letter are not significantly different at the 5% level (p > 0.05). <sup>4</sup>Exchange rate: 1 USD = 14,459.50 Indonesian Rupiah on 27 July 2018.

**Table A2.** Number of hours spent by labour on dairy farm (n = 600).

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>
Total number of labour hours on farm															
<i>Owner's labour</i>	9.11	4.77	a	10.44	4.22	b	10.56	3.85	b	8.81	3.15	a	9.73	4.11	***
<i>Children</i>	0.14	0.71	a	0.35	1.22	a	0.31	1.20	a	0.07	0.39	a	0.22	0.95	**
<i>Females</i>	2.41	2.64		2.47	2.90		2.46	2.51		2.01	2.33		2.34	2.60	
<i>Males</i>	6.57	3.81	a	7.61	3.88	bc	7.79	3.01	c	6.73	3.03	ab	7.18	3.49	***
<i>Hired labour</i>	4.31	9.45		1.34	3.55	a	0.98	3.83	a	0.71	2.44	a	1.84	5.71	***
Total number of owner's hours spend on															
<i>Cut-and-carry grass</i>	4.03	2.71	ab	4.73	2.59	bc	4.91	2.42	c	3.87	1.86	a	4.39	2.45	***
<i>Feeding</i>	0.87	0.78	a	0.99	0.71	a	0.88	0.57	a	0.79	0.59	a	0.88	0.67	*
<i>Providing water</i>	0.45	0.47	a	0.65	1.26	a	0.49	0.39	a	0.44	0.47	a	0.51	0.74	*
<i>Milking</i>	0.94	0.96	a	1.22	1.01	b	1.14	0.75	ab	0.91	0.57	a	1.05	0.85	***
<i>Washing barn / cage</i>	1.16	0.84		1.13	0.67		1.21	0.73		1.08	0.69		1.14	0.74	
<i>Washing cows</i>	0.87	0.94		0.80	0.74		0.91	0.78		0.79	0.89		0.84	0.84	
<i>Cleaning equipment</i>	0.27	0.22		0.31	0.20		0.32	0.21		0.27	0.17		0.29	0.20	
<i>Milk handling (filtering / packing)</i>	0.06	0.13		0.09	0.16		0.09	0.17		0.09	0.11		0.08	0.15	
<i>Milk delivery</i>	0.46	0.43	a	0.53	0.45	ab	0.62	0.52	b	0.57	0.56	ab	0.55	0.49	*
Total number of hours hired labour spend on															
<i>Cut-and-carry grass</i>	2.23	4.53		0.94	2.37	a	0.52	1.45	a	0.41	1.36	a	1.02	2.83	***
<i>Feeding</i>	0.37	1.09		0.05	0.25	a	0.07	0.46	a	0.06	0.33	a	0.14	0.64	***
<i>Providing water</i>	0.12	0.38		0.03	0.20	a	0.04	0.27	a	0.03	0.20	a	0.06	0.28	***
<i>Milking</i>	0.61	2.04		0.13	0.50	a	0.11	0.71	a	0.05	0.23	a	0.22	1.14	***
<i>Washing barn / cage</i>	0.39	1.52		0.06	0.30	a	0.10	0.64	a	0.06	0.34	a	0.15	0.86	***
<i>Washing cows</i>	0.37	1.07		0.06	0.25	a	0.08	0.49	a	0.05	0.28	a	0.14	0.63	***
<i>Cleaning equipment</i>	0.09	0.25		0.03	0.15	a	0.03	0.22	a	0.01	0.06	a	0.04	0.19	***
<i>Milk handling (filtering / packing)</i>	0.04	0.16		0.01	0.05	a	0.00	0.01	a	0.00	0.03	a	0.01	0.09	***
<i>Milk delivery</i>	0.11	0.28		0.04	0.14	a	0.02	0.11	a	0.03	0.14	a	0.05	0.18	***

<sup>1</sup>Value is mean; <sup>2</sup>SD = Standard Deviation; <sup>3</sup>Sig = Significance; \* p < 0.1, \*\* 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 < 0.1). Quartiles with the same letter are not significantly different at the 5% level (p > 0.05).