THE UNIVERSITY of ADELAIDE

The Centre for Global Food and Resources

The IndoDairy Smallholder Household Survey
From Farm-to-Fact

Factsheet 8: Costs, Revenue and Profit

Background

In the previous factsheet, the aspects of milk productivity, price and milk quality were analysed.

In this factsheet, the aspect of cost, revenue and profitability will be considered. This factsheet builds on the information summarised in Factsheets 3, 4 and 7 of the IndoDairy Smallholder Household Survey (ISHS) '*Farm-to-Fact*' series by assessing dairy-related costs, revenue and profitability across the four districts: Bogor, Cianjur, Bandung and Garut.

Financial comparison by district

Production costs

One of the key objectives of the ISHS was to improve the understanding of input costs and overheads related to dairy production.

Farmers in the ISHS were asked to report on the variable costs (e.g. feed and herd health) and overheads (e.g. employed labour, taxes, interest of loans etc) for their dairy business. The results are shown in Table A1 in the Appendix.

Annual production costs

The major variable costs for the dairy farmers related to the purchase of forage, concentrates and supplements, feed delivery costs and herd costs related with maintaining the herd on the farm (e.g. veterinary and herd health, water costs).

On average, across the four districts, total variable costs were 34.0 million IDR (USD 2,351) per annum and total farm cost was 39.5 million IDR (USD 2,732).

Concentrates and supplements accounted for the largest share of costs, making up approximately 74% of total costs. On average, these costs summed to 29.4 million IDR, (approx. USD 2,000) annually.

There was significant variation between the districts, with households in Bogor spending more than twice the amount in concentrates compared to households in Garut.

Multiple factors could affect this, such as farm size, which was higher in Bogor; and arrangements in place with the corresponding dairy cooperatives, which were a major source of inputs for farmers.

Other major costs related to dairy farming were hired labour (3.9 million IDR or USD 274 per annum), feed delivery costs (2 million IDR or USD 138 per annum), and herd costs (1.5 million IDR or USD 104 per annum).

Australian Government Australian Centre for International Agricultural Research
Dairy Australia
Ministry of Agriculture Indonesia
IPB University Bogor Indonesia
Australian Aid

Production costs per litre of milk

Costs and revenue per litre of milk produced were also analysed to help account for differences in factors affecting total costs, such as farm size. See Figure 1 below and Table A2 in the Appendix for the breakdown of costs per litre of milk produced.

The overall high costs of concentrates and supplements (2,147 IDR/L, or USD 0.14/L) was also reflected in these figures. While farmers in Bogor paid the highest rate for concentrates, as seen in the sections below, that these farmers were also received higher revenue from milk sales.

The total cost incurred by dairy farmers for producing a litre of milk was 2,789 IDR (USD 0.19/L).

Family labour

The time contributed to dairy-related activities by family members was a significant opportunity cost for the household and estimated to be an additional in-kind 20.6 million IDR (USD 1,425) per annum (see Table A1 in the Appendix).

Farmers in Bandung and Cianjur had the highest in-kind contribution in labour with 22.5 and 22 million IDR (USD 1,556 and 1,521) per annum, respectively.

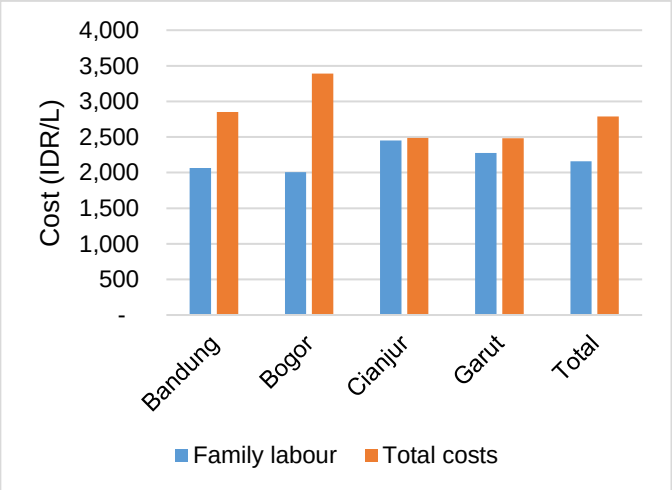

Figure 2. Cost of family labour, compared to total cash costs, per litre of milk produced.

The value of time contributed by family members to producing a litre of milk is shown in Table A2 in the Appendix. On average, **family labour equated to approximately to 2,160 IDR per litre (USD 0.15/L).**

When compared to total cash costs, dairy household members contributed almost the same value as in-kind time in Cianjur and Garut district (Figure 2).

A later factsheet will look at specific details regarding both family and hired labour; however, a major activity was harvesting and collecting grasses. This also explains the low cash costs of forages in Figure 1.

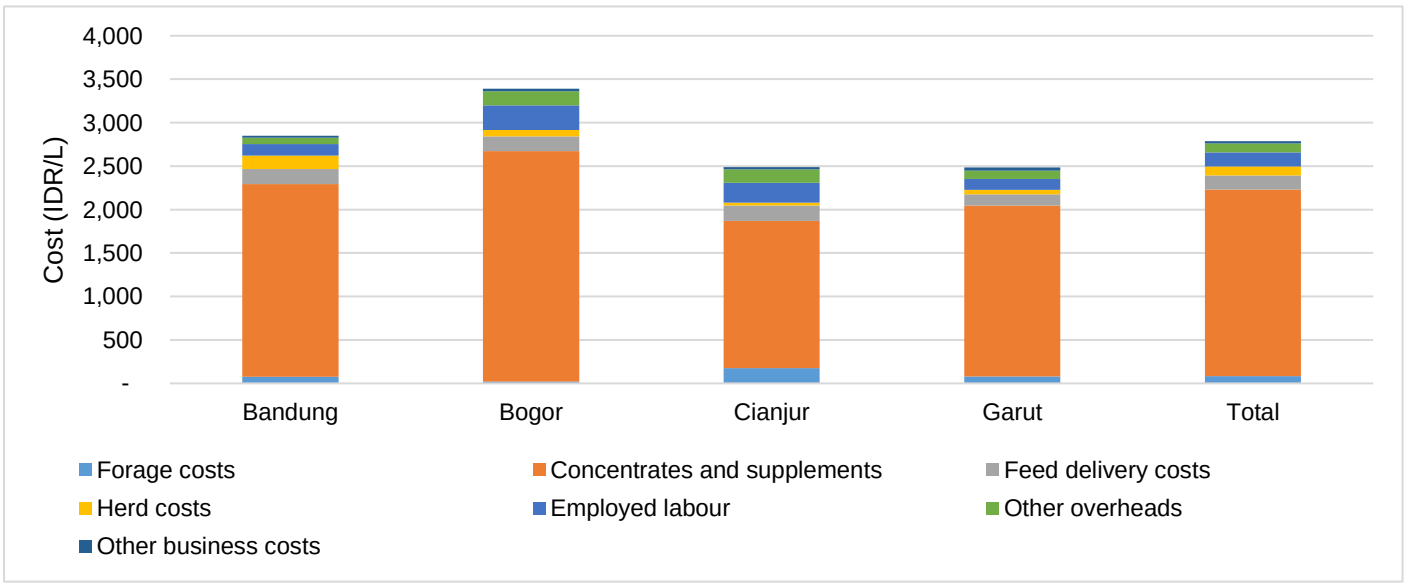

Figure 1. Milk production costs per litre of milk produced grouped by district.

Revenue from milk production

Annual revenue

The average revenue derived from the fresh milk sales (minus cost of delivering the milk) was 63.9 million IDR (USD 4,419) per annum (see Table A1 in the Appendix).

The revenue derived from fresh milk sales was highest in Bogor district (90.50 million IDR or USD 6,258) as compared to the other districts. Farmers in the Garut district had the lowest revenue on average, with less than half that of Bogor farmers (39.6 million IDR or USD 2,738 per annum).

Other aspects of the dairy operations considered while calculating the total farm revenue were the value of milk consumed and fed to calves (2.61 million IDR or USD 181) and sales from processed milk (1.34 million IDR or USD 93).

Bogor district farmers also had the highest revenue from processed milk sales (9.52 million IDR), which was negligible for the other three districts.

The average total revenue from milk production across the four districts was 67.90 million IDR (USD 4,695) per annum.

Revenue per litre of milk produced

Figure 3 shows value per litre based on the three categories of revenue across the districts. On average, the revenue derived from the sale

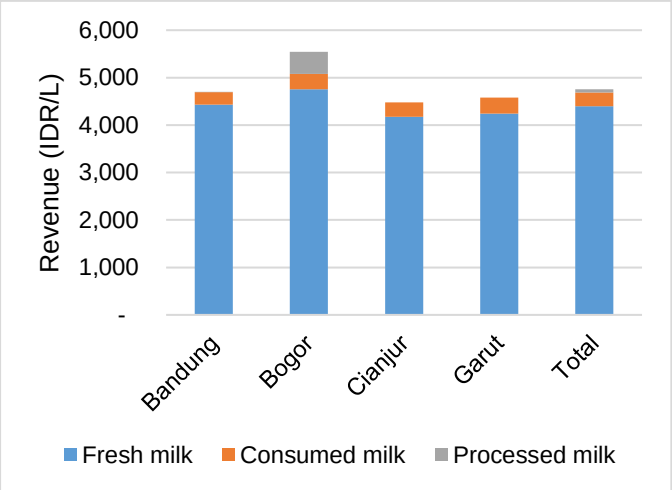

Figure 3. Revenue per litre of milk produced.

of one litre of fresh milk (minus delivery costs) was 4,390 IDR (USD 0.30), as shown in Table A2 in the Appendix.

When including the value of processed milk sales and consumed milk, **the total revenue from a litre of milk produced was 4,756 IDR (USD 0.32).**

Profitability

Figure 4 illustrates the cost, revenue and profit from production of a litre of milk across the four districts.

Farmers in Bogor district had significantly higher revenue (5,547 IDR or USD 0.38 per litre) and costs (3,390 IDR or USD 0.23 per litre) compared to the other districts.

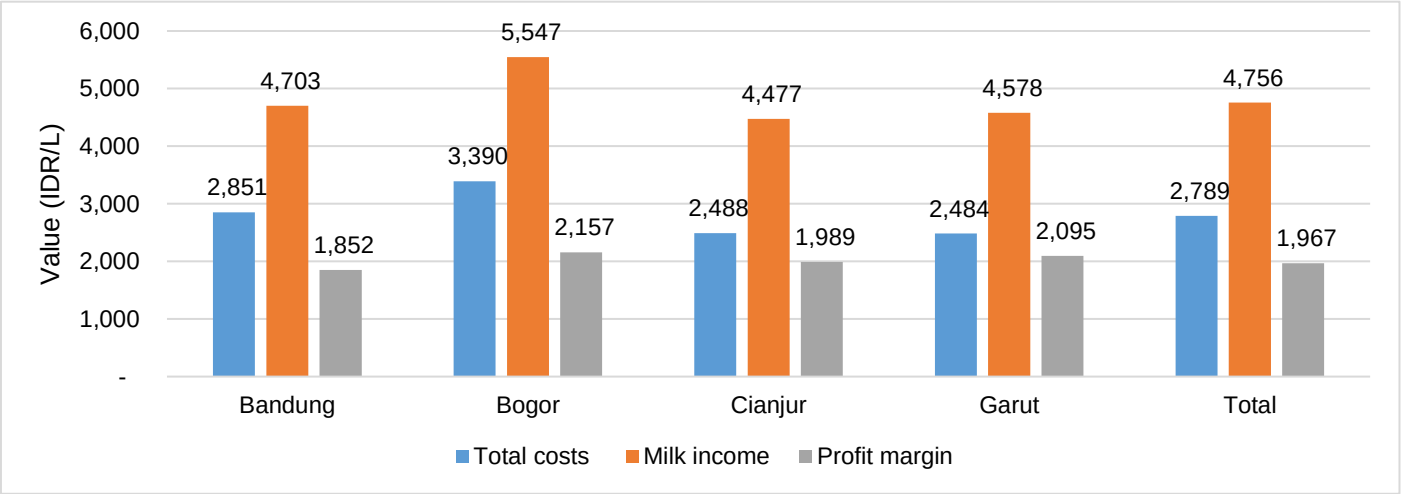

Figure 4. Total production costs, revenue and profit per litre of milk by district.

Farmers in Cianjur received the lowest revenue across the four districts with 4,477 IDR (USD 0.31) per litre at a cost of 2,488 IDR (USD 0.17) per litre.

Despite the significant variation in revenue and costs, **there was no significant differences between profits per litre of milk across the districts.**

The total average profit per litre was 1,967 IDR (USD 0.14 per litre).

Summary

This factsheet has provided an overview of production costs, revenue and profitability of dairy farmers. Key insights highlighted in this factsheet are:

- **On average, across the four districts, total variable costs were 34.0 million IDR (USD 2,351) per annum and total farm cost was 39.5 million IDR (USD 2,732).**
- **Concentrates and supplements accounted for the largest share of costs, making up approximately 74% of total costs.**
- **The total cost incurred by dairy farmers for producing a litre of milk was 2,789 IDR (USD 0.19/L).**
- **Family labour equated to approximately to 2,160 IDR per litre (USD 0.15/L). When compared to total cash costs, dairy household members contributed almost the same value as in-kind time in Cianjur and Garut district.**
- **The average total revenue from milk production across the four districts was 67.90 million IDR (USD 4,695) per annum. The total revenue from a litre of milk produced was 4,756 IDR (USD 0.32).**
- **There were no significant differences between profits per litre of milk across the districts. The total average profit per litre was 1,967 IDR (USD 0.14 per litre).**

The next factsheet, Factsheet 9, will consider the important aspects of technology adoption across the four districts.

Appendix to Factsheet 8

This appendix lists details milk production costs, revenue and profits as an annual and per litre value. These are disaggregated by districts.

Statistical significance between districts 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 ($p < 0.10$). Districts with the same letter are not significantly different at the 5% level ($p > 0.05$).

Table A1. Total annual milk production costs and revenue by district (n=600).

	Bandung			Bogor			Cianjur			Garut			Total		
Variables	**Value[1]**	**SD[2]**	**Sig[3]**	**Value[1]**	**SD[2]**	**Sig[3]**	**Value[1]**	**SD[2]**	**Sig[3]**	**Value[1]**	**SD[2]**	**Sig[3]**	**Value[1]**	**SD[2]**	**Sig[3]**
Variable costs:															
Forage costs	1.21	6.02	a	0.27	1.72	a	2.56	13.10	a	0.57	1.74	a	1.11	6.50	*
Concentrates and supplements	31.5	28.4	b	45.4	55.1		26.70	33.80	ab	17.10	13.80	a	29.40	32.70	***
Feed delivery costs	2.05	3.97	ab	2.81	4.45	b	2.45	3.83	ab	1.15	2.05	a	2.00	3.70	***
Herd costs[4]	2.33	2.04		1.19	2.47	b	0.63	1.46	ab	0.45	0.27	a	1.51	1.97	***
(A) Total variable costs	**37.10**	**32.30**	**a**	**49.70**	**59.60**		**32.30**	**39.90**	**a**	**19.30**	**14.50**		**34.00**	**36.60**	*******
(B) Employed labour costs	2.86	9.96	ab	9.01	25.80	c	7.12	20.80	bc	1.65	6.61	a	3.96	14.50	***
(C) Other overheads[5]	0.84	0.71	a	1.99	2.47	b	1.79	1.83	b	0.79	0.82	a	1.11	1.37	***
(D) Other business costs[6]	0.37	1.06		0.48	1.14		0.39	1.42		0.25	0.68		0.36	1.05	
(E) Total costs (A + B + C + D)	**41.20**	**39.60**	**a**	**61.20**	**82.40**		**41.60**	**56.30**	**a**	**22.00**	**18.60**		**39.50**	**48.10**	*******
Milk revenue:															
Fresh milk sales[7]	67.30	52.70	a	90.50	102.00	b	67.40	65.90	ab	39.60	26.10		63.90	60.90	***
Value of consumed milk[8]	2.66	0.49		2.93	0.66		2.46	0.51	a	2.40	0.16	a	2.61	0.50	***
Processed milk sales	0.16	2.77	a	9.52	47.90		0.00	0.00	a	0.00	0.00	a	1.34	17.80	***
(F) Total milk revenue	**70.10**	**52.90**	**a**	**103.00**	**123.00**		**69.80**	**66.00**	**a**	**42.00**	**26.10**		**67.90**	**66.70**	*******
(G1) Revenue over variable costs (F – A)	33.00	31.80	a	53.20	72.60		37.50	36.60	a	22.70	17.60		33.90	39.10	***
(G2) Revenue over total costs (F – E)	**28.90**	**29.60**	**b**	**41.70**	**58.80**	**c**	**28.20**	**34.30**	**abc**	**20.00**	**15.50**	**a**	**28.40**	**33.80**	*******
(H) Number of lactating cows managed	2.84	2.21	a	3.60	4.02	a	3.28	2.97	a	1.79	1.33		2.75	2.55	***
(I) Profitability per cow per year (G2 / H)	**10.60**	**10.10**		**13.40**	**19.10**		**10.90**	**11.70**		**12.00**	**8.10**		**11.40**	**11.60**	
Opportunity costs:															
Owner's labour[9]	22.50	14.20	b	19.20	12.60	ab	22.00	14.50	b	16.60	9.08	a	20.60	13.20	***

[1]Value = Indonesian Rupiah (IDR) in millions; [2]SD = Standard Deviation; [3]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). Districts with the same letter were not significantly different at the 5% level (p > 0.05). [4]Herd costs include: Cattle health products, veterinary fees, artificial insemination costs and water costs; [5]Other overheads include: taxes, electricity costs, cooperative membership, recorder fees, other membership fees; [6]Other business costs: Land rent and interest on loans; [7]Fresh Milk Sales was revenue from milk sales at the KUD after deducting milk delivery costs; [8]Value of milk consumed by household members and calves. [9]Owner's labour was the estimated value of household members' time towards dairy-related activities, calculated by the amount of time spent multiplied by the hired labour rate.

Table A2. Production costs and revenue per litre of milk produced by district (n = 600).

	Bandung			Bogor			Cianjur			Garut			Total		
Variable	**Value[1]**	**SD[2]**	**Sig[3]**	**Value[1]**	**SD[2]**	**Sig[3]**	**Value[1]**	**SD[2]**	**Sig[3]**	**Value[1]**	**SD[2]**	**Sig[3]**	**Value[1]**	**SD[2]**	**Sig[3]**
Variable costs:															
Forage costs	0.08	0.39		0.02	0.11		0.18	0.76		0.08	0.27		0.08	0.42	
Concentrates and supplements	2.21	1.56	bc	2.65	1.38	c	1.69	1.42	a	1.97	1.18	ab	2.15	1.46	***
Feed delivery costs	0.17	0.32		0.17	0.20		0.18	0.24		0.13	0.23		0.16	0.28	
Herd costs[4]	0.15	0.06		0.07	0.09		0.03	0.03	a	0.05	0.02	a	0.10	0.08	***
Total variable costs	**2.62**	**1.64**	**bc**	**2.91**	**1.50**	**c**	**2.07**	**1.63**	**a**	**2.23**	**1.28**	**ab**	**2.49**	**1.56**	*******
Employed labour costs	0.13	0.41	a	0.28	0.57	a	0.22	0.54	a	0.12	0.36	ab	0.16	0.45	**
Other overheads[5]	0.07	0.07	a	0.16	0.18	b	0.15	0.15	b	0.10	0.10	a	0.10	0.12	***
Other business costs[6]	0.02	0.06		0.03	0.06		0.02	0.04		0.03	0.10		0.03	0.07	
Total costs	**2.85**	**1.74**	**ab**	**3.38**	**1.68**	**b**	**2.48**	**1.77**	**a**	**2.48**	**1.37**	**a**	**2.78**	**1.68**	*******
Milk revenue:															
Fresh milk sales[7]	4.43	0.29		4.75	0.58		4.18	0.59	a	4.24	0.25	a	4.39	0.42	***
Value of consumed milk[8]	0.27	0.19	a	0.32	0.29	ab	0.30	0.39	ab	0.34	0.16	b	0.30	0.24	**
Processed milk sales	0.01	0.12	a	0.47	2.53		0.00	0.00	a	0.00	0.00	a	0.07	0.94	***
Total milk revenue	**4.70**	**0.32**	**a**	**5.55**	**2.55**		**4.48**	**0.69**	**a**	**4.58**	**0.30**	**a**	**4.76**	**1.05**	*******
Revenue over variable costs	2.08	1.62	a	2.63	2.83	a	2.40	1.69	a	2.35	1.25	a	2.26	1.77	*
Revenue over total costs	**1.85**	**1.72**		**2.15**	**2.93**		**1.98**	**1.85**		**2.09**	**1.33**		**1.96**	**1.87**	
Opportunity costs:															
Owner's labour[9]	2.06	1.62		2.01	1.75		2.45	2.57		2.28	1.66		2.16	1.80	

[1]Value = Indonesian Rupiah (IDR) in thousands; [2]SD = Standard Deviation; [3]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). Districts with the same letter were not significantly different at the 5% level (p > 0.05). [4]Herd costs include: Cattle health products, veterinary fees, artificial insemination costs and water costs; [5]Other overheads include: taxes, electricity costs, cooperative membership, recorder fees, other membership fees; [6]Other business costs: Land rent and interest on loans; [7]Fresh Milk Sales was revenue from milk sales at the KUD after deducting milk delivery costs; [8]Value of milk consumed by household members and calves. [9]Owner's labour was the estimated value of household members' time towards dairy-related activities, calculated by the amount of time spent multiplied by the hired labour rate.