



Farm Business Survey

2017/2018

Dairy Farming in England



**Davina Smith, Helen McHoul
and Paul Wilson**

**Farm Business Survey
2017/18**

Dairy Farming in England

Davina Smith, Helen McHoul
and Paul Wilson

Rural Business Research Unit
University of Nottingham
Sutton Bonington Campus
Loughborough
Leicestershire
LE12 5RD

Tel: +44 (0) 115 951 6071

Email: helen.mchoul@nottingham.ac.uk

March 2019

Foreword to the First Series

This report is one of a series being produced based on the results of the Farm Business Survey (FBS) for England. The annual Farm Business Survey is the most comprehensive and independent survey of farm incomes and provides a definitive data source on the economic and physical performance of farm businesses in England. It is conducted by a Consortium comprising the Universities of Cambridge, Newcastle upon Tyne, Nottingham and Reading, and Askham Bryan, Duchy and Imperial Colleges. The Consortium is led by the University of Nottingham and its members work in partnership, using uniform and standard practices in reporting on their findings to ensure consistent data quality, accuracy and validity. The Survey is financed by Defra and the Consortium values greatly the input of their staff.

These detailed reports for various farm types and enterprises are in addition to the comprehensive Farm Business Survey Reports for Government Office Regions published at www.farmbusinesssurvey.co.uk. The Consortium is seeking by these additional reports to ensure that timely and relevant information is available to farmers, consultants, advisers and other organisations and individuals interested in farming and land management. The analysis and publication of these reports uses data from farm businesses across England, with an individual member of the Consortium undertaking the research analysis. In line with the ethos of the Consortium, these reports present results in such a way as to ensure a significant element of continuity and consistency from one report to the other, whilst also ensuring that each report captures the contemporary issues of relevance to the sector of agriculture in England to which it relates.

We believe these reports will make a valuable and useful contribution to the farming industry and we commend them to you.

Prof. Martin Seabrook

(Chief Executive of the Consortium)

Spring 2007

Foreword to the Thirteenth Series

This series of reports on the economics of agriculture and horticulture in England from *Rural Business Research (RBR)* represents the thirteenth series of outputs that focus on providing independent data and analysis to the individual sectors of agriculture and horticulture. As the UK edges closer to an outcome following the EU referendum in June 2016, much uncertainty remains in the sector, the UK and across the EU. At the time of writing the political landscape remains uncertain with the three main outcomes still being possible: i) UK departure from the EU with a deal; ii) UK departure from the EU with no deal; iii) a delay in the UK's departure or a 'no Brexit' outcome. On the assumption that the UK will leave the EU, and that a new UK Agriculture Bill will be passed, then the direction of policy travel for UK agriculture and horticulture has become clearer. The seven year transition deal in subsidy payments based on the Basic Payment demonstrates the plan to transition support to farmers away from this broad land-area based payment structure to one which rewards farmers and land managers more for providing environmental public goods. Reflecting on the likely drivers of success for farm and horticultural business in the future, irrespective of the Brexit outcomes and the future trade deals that may follow, the fundamental business drivers of success remain unchanged. Successful businesses focus on margins by understanding their cost, revenue and market base and they undertake comparative analysis of their business performance against other businesses. These successful businesses look for new business opportunities, and are frequently more diversified in their business base than less successful businesses. Within our reports, RBR aims to provide businesses with the independent data, analysis and interpretation to help them identify their strengths and challenges.

For the 2017/18 year, average Farm Business Income (FBI), derived from our work on the Farm Business Survey (FBS), was £56,500, an increase of 49% on the previous year. While a number of factors led to this increase, the devaluation of the pound, leading to UK commodity prices increasing, played a key role in this income boost. Most farm types witnessed an increase in FBI, with the exception of pig farms who faced an increased cost base at the same time as a decreased closing valuations at the year end from a drop in pig prices at that point in time. Dairy farms witnessed the greatest percentage price increase from 2016/17, as they benefited from both increased milk output and improved milk prices. The influence of currency fluctuation on the performance of agriculture is well recognised. The output of the Brexit scenario on the strength or weakness of sterling alone will have a large influence on business profitability moving forward.

With this thirteenth series of reports on the performance of the different sectors of agriculture and horticulture, our core aim of helping inform agricultural and horticultural businesses about the economics in their sector remains unchanged, and is arguably of even greater importance at this historic point in time. This series of reports, and our work on the FBS more generally, would not be possible without the cooperation of the farmers and growers who participate in the FBS to ensure that the data we provide for policy making, and in our reports and free to use online data services at www.farmbusinesssurvey.co.uk, is truly representative of the sectors. Our sincere thanks therefore go to the farmers and growers for their most valuable contribution.

Professor Paul Wilson

Chief Executive Officer, Rural Business Research

February 2019

www.ruralbusinessresearch.co.uk

Acknowledgements

Rural Business Research thanks sincerely all the farmers who have voluntarily provided records and information on which the annual Farm Business Survey, and this report, is based.

The basic information on which this report is based was collected on behalf of, and largely financed by, the Department for Environment, Food and Rural Affairs and is Crown Copyright.

Table of Contents

Foreword to the First Series	ii
Foreword to the Thirteenth Series	iii
Acknowledgements	iv
List of Tables.....	vi
List of Figures	vi
Summary: Key Findings	vii
Chapter 1: The Dairying Sector	1
1.1: Overview	1
1.2: Structure of Report	4
Chapter 2: Data and Methodology	5
2.1: Data	5
2.2: Methodology	6
Chapter 3: Results	7
3.1: Farm Level Results	7
3.2: Dairy Enterprise Results: Gross Margins.....	14
References.....	21
Glossary.....	22
Appendix 1: Reports in Series.....	23

List of Tables

Table 1.1: Average Annual Milk Price	1
Table 2.1: Observations by Category: Farm-Level Data	5
Table 2.2: Observations by Category: Enterprise-Level Data	6
Table 3.1: Outputs, Inputs and Margins for All Farms, Conventional and Organic	8
Table 3.2: Outputs, Inputs and Margins: Lowland and LFA	9
Table 3.3: Outputs, Inputs and Margins: Lowland by Farm Size	10
Table 3.4: Outputs, Inputs and Margins: LFA by Farm Size	11
Table 3.5: Outputs, Inputs and Margins: Lowland by Profitability Quartiles	12
Table 3.6: Outputs, Inputs and Margins: LFA Profitability Quartiles	13
Table 3.7: Gross Margin Results: All Farms, Conventional and Organic	15
Table 3.8: Gross Margin Results: Lowland and LFA	16
Table 3.9: Gross Margin Results: Lowland by Herd Size	17
Table 3.10: Gross Margin Results: LFA by Herd Size	18
Table 3.11: Gross Margin Results: Lowland by Performance Quartiles	19
Table 3.12: Gross Margin Results: LFA by Performance Quartiles	20

List of Figures

Figure 1.1: Farmgate Milk Prices (UK)	1
Figure 1.2: Milk and Input Prices (UK)	2
Figure 1.3: Annual Milk Production (UK)	2
Figure 1.4: Herd Size and Average Milk Yield (UK)	3
Figure 1.5: Number of Milk Producers (England & Wales)	3
Figure 3.1: Key Gross Margin Components by Conventional and Organic Herds	15

Summary: Key Findings

The Dairying Sector

- During 2017/18, dairy farming in the UK witnessed a rise in milk prices, with a yearly average price of 29.3 pence per litre (ppl); prices peaked in November 2017 at 32.0ppl, returning to 28.5ppl by the end of the milk year
- *Average milk yield - commentary to be updated when data becomes available*
- *The national herd size - commentary to be added when data becomes available*
- Approximately 147 producers left the industry during 2018, a similar number to the 140 leaving the industry in 2017

Farm level results

- Farm Business Survey data from 2017/18 shows that the average Farm Business Income (FBI) from dairying was £753/ha, which at the average farm size equates to a FBI of almost £120,000, representing an increase in total FBI of more than 140% from 2016/17
- Average FBI on conventional dairy farms in 2017/18 was £763/ha (£121,317 per farm), whilst on organic farms average FBI was £563/ha (£88,954 per farm). For the first time since 2014/15, FBI on conventional farms exceeded that of organic farms; FBI on conventional farms was 35.5% higher than on organic farms, compared with 2016/17 when organic farms were 19% higher than conventional farms
- Management and Investment Income (MII) across all dairy farms increased by £429/ha to £444/ha in 2017/18. This equates to an average MII of £70,596 per farm, compared with £2,250 in 2016/17

Dairy Enterprise Results

- Enterprise-level analysis shows that in 2017/18 the conventional herds' total dairy output rose by 27.7% to £2,234/cow, due to a combination of an increase in milk price (+5.8ppl), yield (+16lpc) and average number of cows (+16 cows). Organic herds' total dairy output rose by 5.7% to £2,289/cow, as a result of an increase in milk price (+2.3ppl) and average number of cows per herd (+17 cows); it is noteworthy that yield for organic herds decreased by 132lpc to an average of 6041lpc
- Lowland and LFA herds saw a substantial increase in average milk price of 5.7ppl and 6ppl respectively, with increases in GM/cow of £400 for lowland and £376 for LFA herds. In 2017/18, at the average herd sizes, the total farm GM for lowland herds rose to £251,355 compared with £158,242 in 2016/17, whilst the total LFA herd GM rose to £192,950 compared with £119,922 in 2016/17 (Table 3.8)

Chapter 1: The Dairying Sector

1.1: Overview

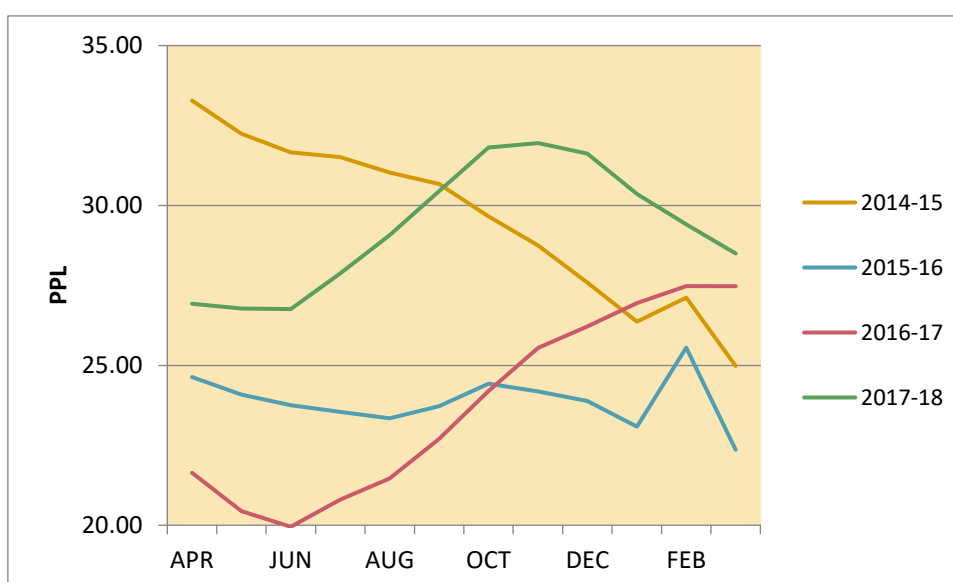
- During 2017/18, dairy farming in the UK experienced a rise in milk prices, peaking at an average of 32.0 pence per litre (ppl) in Nov 2017, followed by a decline from Dec to March 2018. This resulted in a yearly average price of 29.3 ppl, almost reaching the average price of 29.6 ppl reported in 2014/15 (Figure 1.1).
- Bucking the trend of recent years, the key input costs of feed, fertiliser and energy all increased alongside the typical rise in cost of vet and medicines (Figure 1.2).
- UK annual milk production in 2017/18 increased by 462 million litres (+3.24%) to 14,713 million litres (remaining below 2015/16 production of 14,829 million litres) (Figure 1.3).
- *Average milk yield - commentary to be updated when data becomes available*
- *The national herd size - commentary to be added when data becomes available*
- In December 2018, there were approximately 147 fewer milk producers in England and Wales than a year earlier; a fall of 1.57%. Since 2010, numbers have fallen by 1,838, a decrease of almost 17% (Figure 1.5).

Table 1.1: Average Annual Milk Prices

	2014/15	2015/16	2016/17	2017/18
Average annual price (ppl) (excluding bonus')	29.6	23.7	23.7	29.3

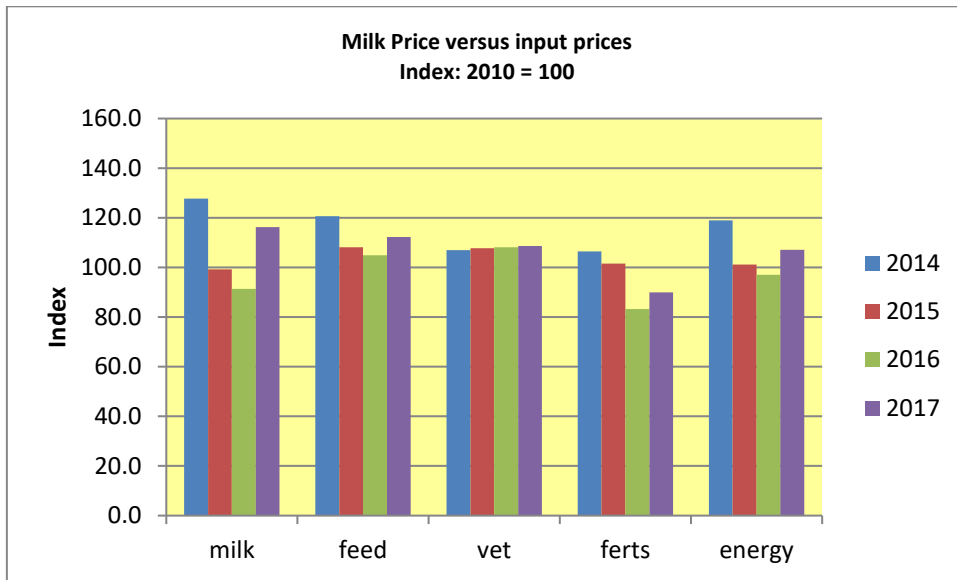
Source: Defra (2019a); Milk Price Surveys

Figure 1.1: Average Farmgate Milk Prices (UK)



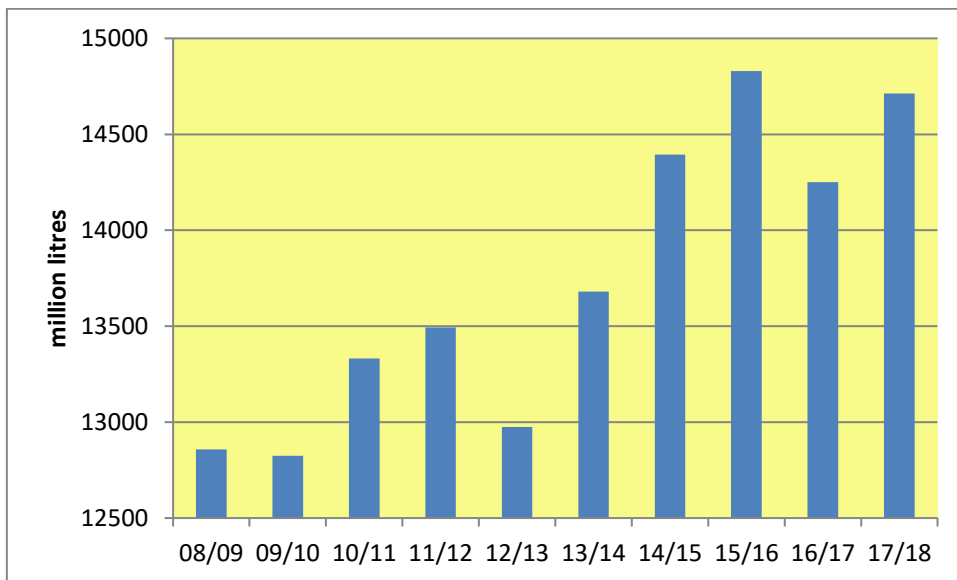
Source: Defra (2019b); Milk Price Surveys

Figure 1.2: Milk and Input Prices (UK)



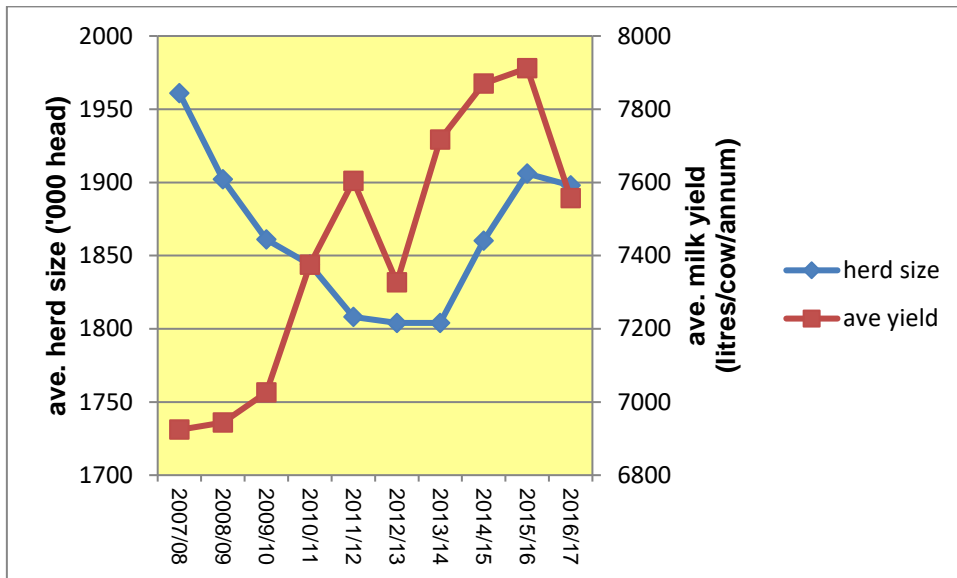
Source: Defra (2019c); Agriculture in the UK 2017

Figure 1.3: UK Annual Milk Production (UK)



Source: AHDB Dairy (2019a)

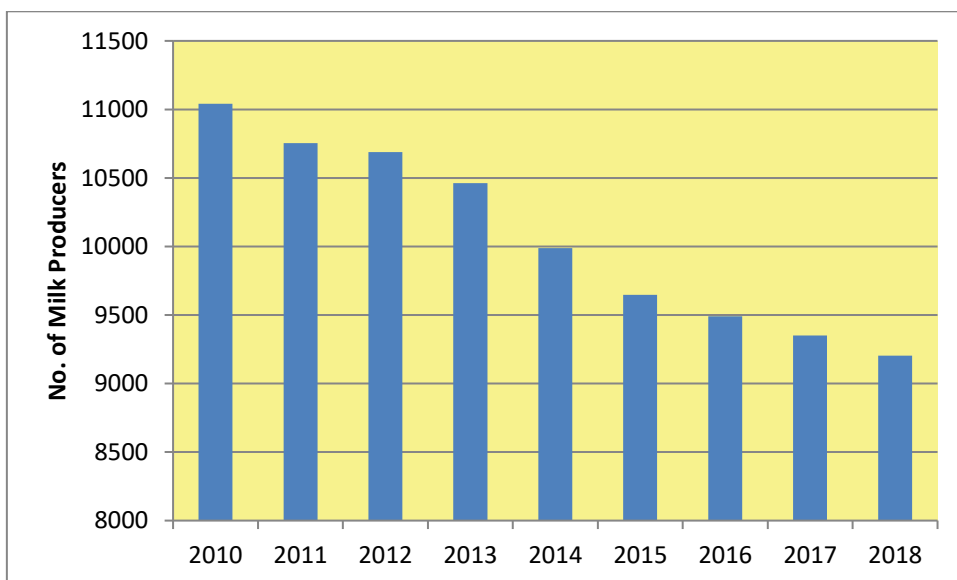
Figure 1.4: UK Herd Size and Average Milk Yield (UK)



Source: AHDB Dairy (2018b)

Data for 2017-18 to be updated when available

Figure 1.5: Number of Milk Producers (England & Wales)



Source: AHDB Dairy (2019c)

1.2: Structure of Report

The above sections have described the market environment in which the dairy sector has been operating during the 2017/18 financial year, whilst making reference to the economic and market conditions over recent years. The remaining chapters of this report are as follows:

- Chapter 2 details the data source and data analysis undertaken
- Chapter 3 provides the results of the data analysis

Chapter 2: Data and Methodology

2.1: Data

The data used in this report are derived from the Farm Business Survey returns for England for those farms classed as Dairy Farms¹ and relate to the outputs, inputs and returns to each farm, together with total farm area and farm size data. Table 2.1 below details the number of observations for the per hectare farm results, in each category by farm type (All, Lowland Conventional, Less Favoured Area (LFA) Conventional and Organic), by farm size categories and by lower and upper performance quartiles. Table 2.2 details the number of observations for the enterprise level results, in each category by farm type (All, Lowland Conventional, LFA Conventional and Organic), by herd size categories and by lower and upper performance quartiles.

For the 2017/18 edition of this report, the farm type classification is based on 2010 Standard Outputs.

Table 2.1: Observations by Category: Farm-Level Data 2017/18

Category		All	Lowland Conventional	LFA Conventional ¹	Fully Organic ²
Number of farms		239	147	56	36
Farm Size	<60 hectares	-	12*	7*	-
	60-120 hectares	-	58	24	-
	>120 hectares	-	77	25	-
Performance by ratio output:costs	Lower quartile	-	42	14*	-
	Upper quartile	-	36	14*	-

1. Holdings on which dairy cows account for more than two thirds of the total Standard Output for the farm. A holding is classified as a Less Favoured Area (LFA) holding if 50 percent or more of its total area is in the LFA and a lowland holding if less than 50 per cent of its total area is in the LFA.

2. In-conversion organic farms are included in the conventional groups.

*Data is derived from a modest sample size and thus there is a lower degree of confidence in the figures

Table 2.2: Observations by Category: Enterprise-Level Data 2017/18

Category		All	Lowland Conventional	LFA Conventional ¹	Fully Organic ²
Number of farms		228	139	53	36
Farm Size	<80 cows	-	20	10	-
	80-130 cows	-	33	19	-
	>130 cows	-	86	24	-
Performance by GM/cow	Lower quartile	-	39	13*	-
	Upper quartile	-	32	13*	-

1. Holdings on which dairy cows account for more than two thirds of the total Standard Output for the farm. A holding is classified as a Less Favoured Area (LFA) holding if 50 percent or more of its total area is in the LFA and a lowland holding if less than 50 per cent of its total area is in the LFA.

2. In-conversion organic farms are included in the conventional groups.

*Data is derived from a modest sample size and thus there is a lower degree of confidence in the figures

2.2: Methodology

The farm and enterprise level data were weighted using the Farm Business Survey weights and the subsequent results presented per hectare (farm level analysis) or per cow (gross margin analysis) basis. Descriptive results with the mean (average) for each category are reported as detailed in Chapter 3.

Chapter 3: Results

3.1: Farm Level Results

- Farm Business Survey data from 2017/18 shows that the average Farm Business Income (FBI) from dairying was £753/ha, which at the average farm size equates to a FBI of almost £120,000, representing an increase of more than 140% for total FBI from 2016/17 (Table 3.1).
- Average FBI on conventional dairy farms in 2017/18 was £763/ha (£121,317 per farm), whilst on organic farms average FBI was £563/ha (£88,954 per farm), resulting in an increase in total FBI per farm of more than 144% for conventional farms and of 53.3% for organic farms total FBI per farm (in comparison to a 6.2% decrease for organic farms in the previous year) (Table 3.1).
- For the first time since 2014/15, FBI on conventional farms exceeded that of organic farms; at £763/ha, FBI on conventional farms was 35.5% higher than on organic farms (£563/ha), compared with 2016/17 when organic farms were 19% higher than conventional farms (Table 3.1).
- Management and Investment Income (MII) across all dairy farms increased by £429/ha to £444/ha in 2017/18. This equates to an average MII of £70,596 per farm, compared with £2,250 in 2016/17 (Table 3.1).
- Average MII on conventional dairy farms increased from £8/ha in 2016/17 to £451/ha (£71,709 per farm) in 2017/18, whilst on organic farms average MII increased by 121% to £303/ha (£47,874 per farm) (Table 3.1).
- Average FBI on lowland dairy farms was £764/ha, an increase of more than 132% from £329/ha in 2016/17. For LFA dairy farms, average FBI increased to £757/ha (from £324/ha in 2016/17) (Table 3.2). This equates to a FBI on a farm level for lowland dairy farms of £124,532 and LFA dairy farms of £108,251 in 2017/18.
- Table 3.3 illustrates the reliance on Farmer / Spouse labour typically found on the smaller lowland dairy farms, i.e. less than 60 hectares, resulting in a familiar, substantially lower MII than was achieved for the two larger size groups presented. The smaller size group achieved a MII of £50/ha, compared with £375/ha and £498/ha for the 60 to 120 hectares and greater than 120 hectares groups respectively.
- As reported in previous years, a regular feature of LFA income results shows that LFA dairy farms within the largest size group operated less intensive systems, achieving the lowest total farm output per hectare, whilst incurring the lowest variable and fixed costs. The respective FBIs at farm level for the less than 60 hectares, the 60 to 120 hectares and the greater than 120 hectares size groups are £43,056, £78,909 and £147,278, with each group showing an increase in FBI for 2017/18 (Table 3.4).
- Profitability analysis reveals that in 2017/18, FBI for the upper quartile of lowland dairy farms was £1466/ha (£854/ha in 2016/17) compared with £177/ha (-£17/ha in 2016/17) for the lower quartile. The upper quartile group has a larger average farm size at 150ha, compared to 115ha for the lower quartile (Table 3.5).
- An analysis of FBI by LFA quartile groupings reveals that the upper quartile achieved a milk output that was £1103/ha greater than that achieved by the lower quartile (in comparison with only £235/ha greater in 2016/17). Variable costs for the lower quartile decreased by more than 16% to £1059/ha, whilst the upper quartile remained fairly static, reducing by only £36/ha to £1018/ha, thus reducing the difference in variable costs between the upper and lower quartiles. At the average farm size, the lower and upper quartiles achieved FBI returns of £37,544 and £200,072 respectively (Table 3.6).

Table 3.1: Outputs, Inputs and Margins for All Farms, Conventional and Organic

	All		Conventional		Organic	
	16/17	17/18	16/17	17/18	16/17	17/18
Number of farms	246	239	209	203	37	36
Area (ha) [#]	150	159	151	159	148	158
	£/ha		£/ha		£/ha	
Output						
Milk	2170	2727	2182	2761	1980	2074
Calf	139	143	141	145	107	103
Lease Quota (net)	0	0	0	0	0	0
Other Dairy	4	10	4	10	1	14
Herd Replacement	-261	-241	-266	-245	-179	-162
Total Dairy Output	2052	2639	2061	2670	1909	2029
Other Livestock	536	534	547	542	363	384
Other	500	535	507	539	377	444
Total Farm Output	3088	3707	3115	3751	2649	2857
Variable Costs						
Home-grown Concentrates	58	68	58	67	64	101
Purchased Concentrates	706	784	716	795	544	570
Coarse Fodder	57	66	59	68	35	34
Other Livestock Concentrates	4	3	4	3	0	0
Vet and Medicine	97	102	99	105	61	51
Other Livestock Costs	243	258	243	259	243	247
Seed	32	32	33	33	24	22
Fertiliser	99	98	103	102	19	12
Crop Protection	37	38	39	40	1	0
Other Crop Costs	20	24	21	24	14	11
Total Variable Costs	1353	1474	1374	1497	1006	1047
Fixed Costs						
Labour	389	412	393	417	320	323
Contract	170	183	172	185	135	131
Machinery Depreciation	184	185	187	188	135	140
Other Machinery	187	207	190	211	152	146
Miscellaneous	270	282	269	283	280	270
Rent and Rental Equivalent	310	321	312	322	280	296
Total Fixed Costs	1510	1591	1523	1605	1302	1306
Net Farm Income	224	642	217	649	341	504
Farmer / Spouse Labour	209	198	210	198	204	201
Management and Investment Income (MII)	15	444	8	451	137	303
Farm Business Income (FBI)	332	753	329	763	392	563

[#] The area used is the total farm area including woodland, roads, water, area not used for agriculture

Table 3.2: Outputs, Inputs and Margins: Lowland and LFA Farms

	Lowland		LFA	
	16/17	17/18	16/17	17/18
Number of farms	154	147	55	56
Area (ha)#	153	163	139	143
	£/ha		£/ha	
Output				
Milk	2225	2835	1963	2384
Calf	137	141	161	165
Lease Quota (net)	0	0	0	0
Other Dairy	4	8	4	17
Herd Replacement	-264	-244	-272	-253
Total Dairy Output	2101	2741	1855	2313
Other Livestock	560	543	480	533
Other	547	586	304	301
Total Farm Output	3208	3870	2639	3146
Variable Costs				
Home-grown Concentrates	59	73	49	38
Purchased Concentrates	725	817	669	686
Coarse Fodder	58	70	62	57
Other Livestock Concentrates	5	4	0	0
Vet and Medicine	100	107	92	94
Other Livestock Costs	247	264	225	231
Seed	37	37	11	10
Fertiliser	107	104	84	93
Crop Protection	45	46	10	8
Other Crop Costs	22	27	11	13
Total Variable Costs	1406	1549	1212	1230
Fixed Costs				
Labour	409	430	313	346
Contract	181	194	128	140
Machinery Depreciation	193	193	158	158
Other Machinery	199	221	144	156
Miscellaneous	278	290	222	248
Rent and Rental Equivalent	323	336	253	253
Total Fixed Costs	1583	1665	1219	1301
Net Farm Income	219	656	207	616
Farmer / Spouse Labour	205	190	233	240
Management and Investment Income (MII)	14	466	-25	376
Farm Business Income (FBI)	329	764	324	757

The area used is the total farm area including woodland, roads, water, area not used for agriculture

Table 3.3: Outputs, Inputs and Margins: Lowland by Farm Size

Lowland	< 60 ha [small]		60 – 120 ha [medium]		>120 ha [large]	
	16/17*	17/18*	16/17	17/18	16/17	17/18
Number of farms	15	12	62	58	77	77
Area (ha) #	47	46	87	86	218	225
	£/ha		£/ha		£/ha	
Output						
Milk	2011	2429	2774	3423	2079	2706
Calf	186	187	189	195	120	127
Lease Quota (net)	0	0	0	0	0	0
Other Dairy	11	53	5	32	3	2
Herd Replacement	-264	-263	-343	-299	-242	-230
Total Dairy Output	1943	2407	2625	3351	1960	2605
Other Livestock	515	530	680	664	528	515
Other	306	341	390	407	600	635
Total Farm Output	2765	3278	3694	4422	3088	3754
Variable Costs						
Home-grown Concentrates	33	57	45	51	64	78
Purchased Concentrates	718	660	865	966	687	786
Coarse Fodder	85	88	76	95	52	64
Other Livestock Concentrates	0	0	1	0	6	5
Vet and Medicine	113	97	116	118	96	104
Other Livestock Costs	255	257	312	325	228	250
Seed	6	3	27	28	41	41
Fertiliser	99	98	121	131	103	98
Crop Protection	8	5	22	23	53	53
Other Crop Costs	25	25	24	25	22	27
Total Variable Costs	1342	1290	1609	1761	1351	1505
Fixed Costs						
Labour	147	154	411	470	419	428
Contract	199	135	195	201	177	194
Machinery Depreciation	158	162	234	232	182	185
Other Machinery	160	165	211	231	197	221
Miscellaneous	336	321	361	394	252	264
Rent and Rental Equivalent	311	316	355	360	315	331
Total Fixed Costs	1312	1253	1768	1888	1541	1623
Net Farm Income	111	735	318	774	196	626
Farmer / Spouse Labour	647	685	399	398	134	128
Management and Investment Income (MII)	-537	50	-81	375	62	498
Farm Business Income (FBI)	163	824	482	949	293	718

The area used is the total farm area including woodland, roads, water, area not used for agriculture

* Data is derived from a modest sample size and thus there is a lower degree of confidence in the figures

Table 3.4: Outputs, Inputs and Margins: LFA by Farm Size

LFA	< 60 ha [small]		60 – 120 ha [medium]		>120 ha [large]	
	16/17*	17/18*	16/17	17/18	16/17	17/18
Number of farms	9	7	19	24	27	25
Area (ha) [#]	45	48	87	87	202	211
	£/ha		£/ha		£/ha	
Output						
Milk	2293	3262	2340	2708	1839	2227
Calf	181	206	228	222	142	144
Lease Quota (net)	0	0	0	0	0	0
Other Dairy	8	87	1	30	4	8
Herd Replacement	-409	-466	-286	-226	-258	-251
Total Dairy Output	2073	3090	2283	2734	1727	2128
Other Livestock	457	501	459	503	487	545
Other	555	598	270	334	294	274
Total Farm Output	3085	4188	3012	3571	2508	2947
Variable Costs						
Home-grown Concentrates	49	73	35	32	53	38
Purchased Concentrates	894	1105	845	899	606	591
Coarse Fodder	67	81	58	54	63	56
Other Livestock Concentrates	0	0	0	0	0	0
Vet and Medicine	85	99	114	110	86	89
Other Livestock Costs	247	329	247	265	217	215
Seed	3	6	5	5	13	11
Fertiliser	84	117	86	90	84	93
Crop Protection	2	4	8	7	12	8
Other Crop Costs	15	12	9	16	11	12
Total Variable Costs	1445	1825	1407	1478	1144	1114
Fixed Costs						
Labour	291	272	280	327	324	357
Contract	125	163	130	133	128	141
Machinery Depreciation	263	301	200	219	140	130
Other Machinery	196	244	160	207	136	133
Miscellaneous	365	439	268	298	199	220
Rent and Rental Equivalent	194	203	264	244	254	258
Total Fixed Costs	1434	1621	1303	1429	1181	1240
Net Farm Income	205	742	303	664	183	593
Farmer / Spouse Labour	646	683	411	401	155	161
Management and Investment Income (MII)	-441	58	-108	263	27	431
Farm Business Income (FBI)	353	897	548	907	264	698

[#] The area used is the total farm area including woodland, roads, water, area not used for agriculture

*Data is derived from a modest sample size and thus there is a lower degree of confidence in the figures

Table 3.5: Outputs, Inputs and Margins: Lowland by Profitability Quartiles

Lowland	Lower quartile		Upper quartile	
	16/17	17/18	16/17	17/18
Number of farms	42	42	36	36
Area (ha)#	116	115	175	150
Output	£/ha		£/ha	
Milk	1590	2243	2826	3187
Calf	111	139	154	168
Lease Quota (net)	0	0	0	0
Other Dairy	4	20	8	10
Herd Replacement	-236	-213	-297	-264
Total Dairy Output	1469	2189	2691	3102
Other Livestock	438	507	667	686
Other	444	491	658	689
Total Farm Output	2351	3188	4016	4476
Variable Costs				
Home-grown Concentrates	49	78	62	102
Purchased Concentrates	577	737	808	771
Coarse Fodder	55	63	78	59
Other Livestock Concentrates	0	14	5	5
Vet and Medicine	76	94	119	103
Other Livestock Costs	226	283	268	271
Seed	43	31	36	34
Fertiliser	108	96	113	118
Crop Protection	45	41	47	37
Other Crop Costs	21	32	20	24
Total Variable Costs	1199	1468	1557	1523
Fixed Costs				
Labour	341	401	466	424
Contract	177	196	201	171
Machinery Depreciation	171	176	206	210
Other Machinery	183	229	207	209
Miscellaneous	260	313	313	268
Rent and Rental Equivalent	300	308	361	343
Total Fixed Costs	1432	1624	1754	1626
Net Farm Income	-280	96	706	1327
Farmer / Spouse Labour	279	295	171	209
Management and Investment Income (MII)	-559	-199	535	1119
Farm Business Income (FBI)	-17	177	854	1466

The area used is the total farm area including woodland, roads, water, area not used for agriculture. The upper and lower quartiles represent the top and bottom 25% of the total population, which can produce sample numbers per quartile that are not equal.

Table 3.6: Outputs, Inputs and Margins: LFA by Profitability Quartiles

LFA	Lower quartile		Upper quartile	
	16/17*	17/18*	16/17*	17/18*
Number of farms	13	14	14	14
Area (ha)#	118	104	185	178
Output	£/ha		£/ha	
Milk	1770	1563	2005	2666
Calf	123	134	175	173
Lease Quota (net)	0	0	0	0
Other Dairy	7	29	1	11
Herd Replacement	-254	-212	-262	-256
Total Dairy Output	1645	1514	1920	2594
Other Livestock	338	431	518	493
Other	371	369	287	290
Total Farm Output	2354	2315	2725	3377
Variable Costs				
Home-grown Concentrates	69	27	34	36
Purchased Concentrates	767	622	567	521
Coarse Fodder	48	76	70	37
Other Livestock Concentrates	0	0	0	0
Vet and Medicine	79	84	86	80
Other Livestock Costs	208	172	159	196
Seed	10	6	11	13
Fertiliser	65	53	102	114
Crop Protection	5	3	13	11
Other Crop Costs	12	17	12	10
Total Variable Costs	1265	1059	1054	1018
Fixed Costs				
Labour	315	253	304	361
Contract	125	106	116	158
Machinery Depreciation	189	160	123	125
Other Machinery	142	153	130	119
Miscellaneous	242	204	205	256
Rent and Rental Equivalent	234	210	277	320
Total Fixed Costs	1248	1085	1155	1340
Net Farm Income	-158	170	516	1019
Farmer / Spouse Labour	308	342	152	180
Management and Investment Income (MII)	-467	-172	365	839
Farm Business Income (FBI)	-25	361	631	1124

The area used is the total farm area including woodland, roads, water, area not used for agriculture. The upper and lower quartiles represent the top and bottom 25% of the total population, which can produce sample numbers per quartile that are not equal.

*Data is derived from a modest sample size and thus there is a lower degree of confidence in the figures

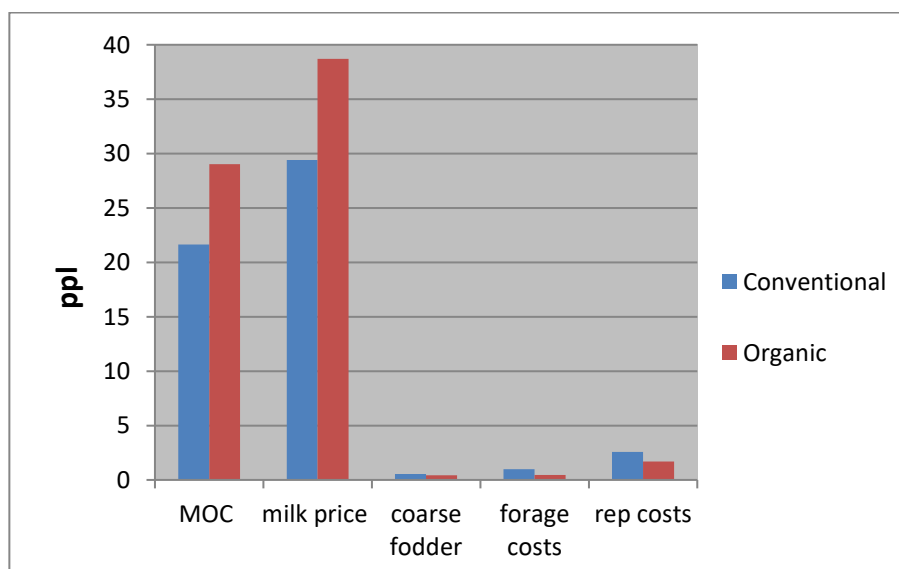
3.2: Dairy Enterprise Results: Gross Margins

- Enterprise-level analysis in 2017/18 shows that the conventional herd total dairy output was only £55/ha lower than the level achieved by the organic herd. Organic herds total dairy output rose by 5.7% to £2289/cow, due to increases in milk price (+2.3ppl). The average number of cows per herd increased by 17 cows however yield reduced by 132lpc. The conventional herd total dairy output rose by 27.7% to £2,234/cow as a result of an increase in both milk price (+5.8ppl) and yield (+16lpc). Conventional herd size increased slightly by 16 cows (Table 3.7).
- The higher milk price and lower variable costs achieved by organic herds resulted in a gross margin of £1,389/cow compared with £1,264/cow for the conventional dairy herds. The difference between the organic and conventional dairy herd gross margins was much wider in 2016/17, whereby conventional herds produced a gross margin of £869/cow compared with the organic herd gross margin of £1,264/cow (Table 3.7).
- The higher milk price achieved by organic herds, coupled with their lower concentrate feed costs, resulted in organic herds achieving a margin over concentrate performance that exceeded that of conventional herds by 7.37ppl, which was lower than the previous year's excess of 10.54ppl (Figure 3.1).
- Lowland and LFA herds saw a substantial increase in average milk price of 5.7ppl and 6ppl respectively, with increases in GM/cow of £400 for lowland and £376 for LFA herds. In 2017/18, at the average herd sizes, the total farm GM for lowland herds rose to £251,355 compared with £158,242 in 2016/17, whilst the total LFA herd GM rose to £192,950 compared with £119,922 in 2016/17 (Table 3.8).
- For lowland herds, as noted in previous reports, as herd size increases so do milk price, milk output/cow, total dairy output/cow and total gross margin/cow. Gross margins per cow for the less than 80 cows, the 80 to 130 cows and the greater than 130 cows groups were £1,090, £1,139 and £1,315 respectively. These margins per cow equate to gross margins per litre of 15.97ppl, 15.99ppl and 16.02ppl respectively, i.e. the smallest sized group achieved the lowest gross margin per litre, although the difference between each group narrowed in 2017/18 compared with 2016/17 (Table 3.9).
- As with lowland herds, for LFA dairy herds milk price increases as herd size increases, with the highest dairy output and gross margin per cow being achieved by the 80 – 130 cows group. 2017/18 saw an increase in average milk price; for the less than 80 cows, 80 – 130 cows and more than 130 cows this was 4.6ppl, 5.6ppl and 6.2ppl, with corresponding GM increases of £320, £386 and £376 per cow. In line with last year, the GM for the LFA 80 – 130 cows was the only group which exceeded that of the lowland herd for the same group size and was greater by £28/cow (Table 3.10).
- In 2017/18 lowland dairy farms in the upper quartile (based on GM/cow) produced on average 3,163lpc more than those in the lower quartile, with average milk prices for the upper quartile only exceeding those of the lower quartile by 0.3ppl. In 2016/17, the difference in milk price was 3.5ppl between the upper and lower quartile for lowland dairy farms (Table 3.11).
- Feed concentrate to milk conversion rates rose to 7.3ppl and 7.7ppl for the GM lowland upper and lower quartile farms respectively (from 6.6ppl and 7.2ppl for 2016/17); the upper quartile increase was in part due to an increase in concentrate cost, whilst the lower quartile was influenced by a substantial decrease in average yield, as there was a slightly lower feed price. Furthermore, gross margin per litre results increased to 17.1ppl (upper quartile) and 13.9ppl (lower quartile) compared to 13.3ppl (upper quartile) and 6.8ppl (lower quartile) in 2016/17 (Table 3.11).
- Gross margin performance quartile analysis of LFA dairy farms reveals that the better performers have larger herds and achieve substantially higher yields (+2,584 lpc) as well as receiving higher milk prices (+2.1ppl) than the lowest quartile, leading to a disparity of £831 between the two quartile's relative gross margin per cow performances (compared with £689 in 2016/17) (Table 3.12).

Table 3.7: Gross Margin Results for All Farms, Conventional and Organic

	All		Conventional		Organic	
	16/17	17/18	16/17	17/18	16/17	17/18
Number of farms	227	228	192	192	35	36
Average number cows	172	188	175	191	123	140
Average yield (litres)	7776	7789	7844	7860	6173	6041
Milk price (ppl)	24.0	29.6	23.6	29.4	36.4	38.7
	£/cow		£/cow		£/cow	
Output						
Milk	1865	2309	1849	2307	2245	2339
Calf	120	121	121	122	114	116
Lease Quota (net)	0	0	0	0	0	0
Other Dairy	3	9	3	8	2	16
Herd Replacement	-222	-202	-223	-203	-196	-183
Total Dairy Output	1766	2236	1749	2234	2165	2289
Variable costs						
Concentrates	542	608	541	609	565	585
Coarse Fodder	37	42	38	43	21	26
Vet and Medicine	70	73	70	74	54	49
Other Livestock Costs	160	170	157	168	230	213
Forage Costs	72	75	74	77	31	27
Total Variable Costs	881	968	881	970	901	900
Total Gross Margin	885	1269	869	1264	1264	1389

Figure 3.1: Key Gross Margin Components by Conventional and Organic Herds



MOC = margin over concentrates; rep costs = replacement costs

Table 3.8: Gross Margin Results: Conventional Lowland and LFA Farms

	Lowland		LFA	
	16/17	17/18	16/17	17/18
Number of farms	141	139	51	53
Average number cows	178	195	158	170
Average yield (litres)	8039	8044	6823	6917
Milk price (ppl)	23.6	29.3	23.4	29.4
	£/cow		£/cow	
Output				
Milk	1897	2361	1596	2035
Calf	117	118	141	141
Lease Quota (net)	0	0	0	0
Other Dairy	4	7	2	14
Herd Replacement	-222	-201	-230	-215
Total Dairy Output	1795	2285	1510	1975
Variable costs				
Concentrates	555	626	467	520
Coarse Fodder	39	45	34	33
Vet and Medicine	72	75	62	66
Other Livestock Costs	163	171	127	154
Forage Costs	77	79	61	66
Total Variable Costs	905	996	750	840
Total Gross Margin	889	1289	759	1135

Table 3.9: Gross Margin Results: Conventional Lowland by Herd Size

Lowland	< 80 cows [small]		80 – 130 cows [medium]		>130 cows [large]	
	16/17	17/18	16/17	17/18	16/17	17/18
Number of farms	20	20	34	33	87	86
Average number cows	58	61	102	103	224	245
Average yield (litres)	6465	6826	7045	7122	8251	8206
Milk price (ppl)	21.5	28.3	22.5	28.4	23.8	29.5
	£/cow		£/cow		£/cow	
Output						
Milk	1393	1930	1589	2025	1963	2419
Calf	136	133	124	135	115	115
Lease Quota (net)	0	0	0	0	0	0
Other Dairy	10	39	2	38	4	2
Herd Replacement	-147	-163	-211	-200	-227	-203
Total Dairy Output	1392	1939	1503	1999	1854	2334
Variable costs						
Concentrates	397	481	434	511	579	646
Coarse Fodder	27	35	16	36	42	46
Vet and Medicine	66	65	62	63	74	77
Other Livestock Costs	152	193	155	170	165	170
Forage Costs	73	75	82	81	76	79
Total Variable Costs	715	849	749	860	936	1018
Total Gross Margin	677	1090	754	1139	918	1315

Table 3.10: Gross Margin Results: Conventional LFA by Herd Size

LFA	< 80 cows [small]		80 – 130 cows [medium]		>130 cows [large]	
	16/17*	17/18*	16/17	17/18	16/17	17/18
Number of farms	9	10	21	19	21	24
Average number cows	49	57	105	107	249	250
Average yield (litres)	6200	5563	7578	7411	6607	6877
Milk price (ppl)	22.5	27.1	23.0	28.6	23.6	29.8
	£/cow		£/cow		£/cow	
Output						
Milk	1395	1508	1745	2117	1560	2051
Calf	114	128	162	170	136	134
Lease Quota (net)	0	0	0	0	0	0
Other Dairy	11	48	0	38	2	4
Herd Replacement	-276	-205	-246	-207	-220	-218
Total Dairy Output	1244	1479	1661	2118	1478	1971
Variable costs						
Concentrates	509	414	568	647	427	492
Coarse Fodder	18	24	32	32	36	34
Vet and Medicine	43	41	73	62	59	70
Other Livestock Costs	121	120	152	152	118	157
Forage Costs	47	55	55	57	64	69
Total Variable Costs	738	654	881	951	705	822
Total Gross Margin	506	826	781	1167	773	1149

*Data is derived from a modest sample size and thus there is a lower degree of confidence in the figures

Table 3.11: Gross Margin Results: Conventional Lowland by Profitability Quartiles

Lowland	Lower Quartile		Upper Quartile	
	16/17	17/18	16/17	17/18
Number of farms	40	39	30	32
Average number cows	143	145	220	244
Average yield (litres)	6931	6199	9305	9362
Milk price (ppl)	21.5	29.1	25.0	29.4
	£/cow		£/cow	
Output				
Milk	1487	1805	2323	2753
Calf	97	99	122	134
Lease Quota (net)	0	0	0	0
Other Dairy	3	13	6	5
Herd Replacement	-283	-234	-203	-176
Total Dairy Output	1303	1684	2249	2715
Variable costs				
Concentrates	502	479	613	684
Coarse Fodder	39	50	61	82
Vet and Medicine	68	65	84	80
Other Livestock Costs	157	158	180	188
Forage Costs	69	72	75	83
Total Variable Costs	835	825	1013	1117
Total Gross Margin	469	859	1236	1598

Table 3.12: Gross Margin Results: Conventional LFA by Profitability Quartiles

LFA	Lower Quartile		Upper Quartile	
	16/17*	17/18*	16/17*	17/18*
Number of farms	13	13	14	13
Average number cows	103	135	206	177
Average yield (litres)	4962	5360	7581	7944
Milk price (ppl)	21.3	28.0	24.1	30.1
	£/cow		£/cow	
Output				
Milk	1058	1498	1828	2392
Calf	135	100	164	156
Lease Quota (net)	0	0	0	0
Other Dairy	0	26	2	9
Herd Replacement	-274	-270	-186	-199
Total Dairy Output	919	1355	1808	2358
Variable costs				
Concentrates	402	427	502	545
Coarse Fodder	23	37	31	24
Vet and Medicine	38	56	70	69
Other Livestock Costs	95	114	140	148
Forage Costs	53	50	68	72
Total Variable Costs	611	685	811	857
Total Gross Margin	308	670	997	1501

*Data is derived from a modest sample size and thus there is a lower degree of confidence in the figures

References

Defra (2019a). Milk Price Surveys

<https://www.gov.uk/government/statistics/uk-milk-prices-and-composition-of-milk>
(as at 10/12/18)

Defra (2019b). Milk Price Surveys

<https://www.gov.uk/government/statistics/uk-milk-prices-and-composition-of-milk>
(as at 10/12/18)

Defra (2019c). Agriculture in the UK 2017

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/741062/AUK-2017-18sep18.pdf
(as at 20/11/18)

AHDB Dairy (2019a)

http://dairy.ahdb.org.uk/resources-library/market-information/supply-production/monthly-milk-production/#.W_Q_n-j7TIV
(as at 20/11/18)

AHDB Dairy (2018b) – *to be updated when latest data becomes available*

<http://dairy.ahdb.org.uk/market-information/farming-data/milk-yield/average-milk-yield/#.VIWMcmcnzMo>
(as at 4/12/2017)

AHDB Dairy (2019c)

<https://dairy.ahdb.org.uk/market-information/farming-data/producer-numbers/uk-producer-numbers/#.WEk6V7KLTG>
(as at 10/12/2018)

Glossary

Output: Other Livestock is comprised of sales of non-dairy livestock and livestock products adjusted for valuation changes plus the value of produce used on the farm and consumed in the farmhouse or by the workers, less livestock purchases. Miscellaneous livestock receipts are also included.

Output: Other is the sales of crops adjusted for valuation changes, plus the value of produce used on the farm (other than forage crops and straw) and produce consumed in the farmhouse or by the workers. Income from land let and buildings let, hirework, non-allocated grants e.g. for environmental schemes, single farm payment, profit on resale of purchased agricultural produce and other miscellaneous farm income including the change in valuation of cultivations is also included.

Other livestock costs include livestock haulage, marketing charges, AI charges, straw and wood shavings for bedding and dairy sundries.

Other crop costs include silage bags, twine, all marketing costs including crop haulage, purchase of standing crops, soil analysis and potato sacks.

Labour is comprised of the gross cost of regular paid employees including an allowance for perquisites together with unpaid family labour (other than the farmer and spouse) manual labour.

Machinery depreciation is calculated using the current cost accounting method whereby each item of equipment is revalued by an index prior to the depreciation calculation.

Rent and Rental Equivalent consist of gross rent, imputed rent on the net cost of the tenant's own improvements, drainage rates and for owner-occupied land a rental value based on what a tenant would be paying for similar land with an equal length of occupancy.

Miscellaneous costs include water charges, vehicle tax, insurance, professional fees, bank commission, telephone charges, subscriptions, office expenses and pest control, general repairs.

Net Farm Income (NFI) is total output less total inputs as defined above. It represents the reward to the farmer and spouse for their own manual labour, management and a return on tenant's capital.

Farmer's and spouse's manual labour is the estimated value of their manual labour.

Management and Investment Income (MII) is Net Farm Income less the allowance made for the farmer's and spouse's manual labour. It represents the reward for management and a return on tenant's capital. MII therefore represents the return to management after all costs have been deducted, including the imputed cost of all unpaid manual labour and a notional rent on owner occupied land and buildings.

Farm Business Income (FBI) represents the return to all unpaid labour (farmers, spouses and others with an entrepreneurial interest in the farm business) and to all their capital invested in the farm business including land and farm buildings. It is defined as Total Farm Output (TFO) minus cost (C): where TFO is defined as the sum of output from: crop enterprises, adjustment for disposal of previous crops, livestock enterprises, separable non-agricultural diversification, single farm payment, agri-environmental payments, other grants and subsidies, miscellaneous receipts; C is defined as variable costs plus fixed costs. *[For 2006/07 the definition of FBI included the profit / loss on sale of assets as part of the total farm output]*

Total Gross Margin, presented for the dairy enterprise results, is total dairy output minus total variable costs.

Appendix 1: Reports in Series

Reports in this series:

Crop Production in England

Dairying Farming in England

Hill Farming in England

Horticulture Production in England (Horticultural Business Data)

Lowland Grazing Livestock Production in England

Pig Production in England

Poultry Production in England

Organic Farming in England

Details available at www.ruralbusinessresearch.co.uk