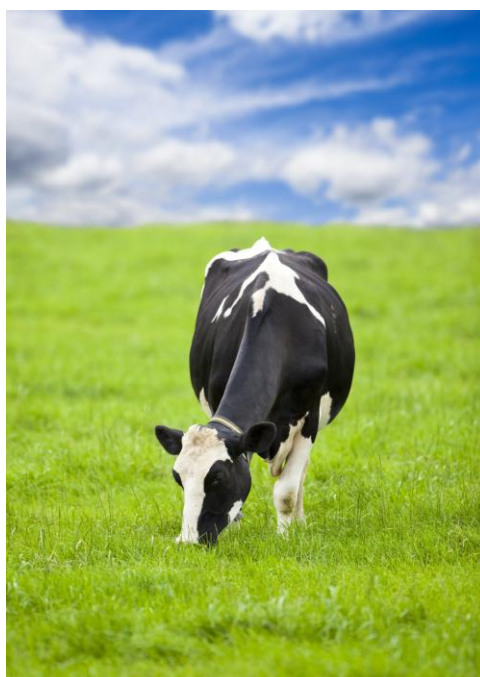




# Farm Business Survey

2008/2009

## Dairy Farming in England



Philip Robertson and Paul Wilson



**Farm Business Survey  
2008/09**

**Dairy Farming in England**

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## **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 lead 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](http://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 new 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)

## Foreword to the Fourth Series

As agriculture enters the second decade of the 21<sup>st</sup> Century, the financial prospects for many sectors are arguably brighter than five years ago. The importance of agriculture as a provider of food, environmental and ecosystem services and biofuels, is becoming increasingly recognised. Issues of food security in a world with changing climatic conditions and a growing population have led to agriculture and food production being viewed in a more positive light than has appeared to be the case throughout much of the previous 20 to 30 years. However, countering this growing interest in agriculture, food, the environment and fuel is the prospect of a reduced single payment beyond 2012 and continuing and widening volatility in both input and output prices. In the early months of 2010, the prospects for agriculture and horticulture thus appear somewhat mixed with the outputs being arguably more valued by society, yet with businesses needing to adapt to a potentially more volatile market environment.

Now in its fourth series, these enterprise and farm type reports from *Rural Business Research (RBR)* once again provide independent data and results from expert analysis of the Defra-funded Farm Business Survey (FBS) for England drawing upon 2008/09 data. Users of FBS data increasingly also rely on RBR's other independent outputs that are freely available on-line at [www.farmbusinesssurvey.co.uk](http://www.farmbusinesssurvey.co.uk) where Government Office Regional reports and farm business benchmarking services sit along-side the more specialised FBS data builder tool. As with all businesses, farmers and growers are increasingly reliant upon obtaining information from the internet. In order to enhance farmers, growers, advisors and other stakeholders use of our on-line services, RBR plans to host a series of regional workshops in the Spring of 2011 and 2012, and we will be announcing details of these in late 2010 so please visit both [www.farmbusinesssurvey.co.uk](http://www.farmbusinesssurvey.co.uk) and [www.ruralbusinessresearch.co.uk](http://www.ruralbusinessresearch.co.uk) to keep up to date with new results, publications and our plans for our regional workshops.

We hope that you will find this fourth series of reports to be informative and interesting to your work and businesses. As with all our outputs, *Rural Business Research* provides analysis on agricultural and horticultural business performance to provide users with independent results. We always welcome comment on our outputs, so please let us know your thoughts by emailing [paul.wilson@nottingham.ac.uk](mailto:paul.wilson@nottingham.ac.uk) to let us know your views on our publications.

**Dr Paul Wilson**

Chief Executive Officer, Rural Business Research

Spring 2010

## **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.

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## Summary

- Dairy Farming in England during 2008/09 experienced a sustained period of higher milk prices than has been seen in recent years; key input costs, most notably feed, fertiliser and energy, all increased by significant amounts
- Annual milk production declined further to levels not witnessed since 1972
- Published sources reveal that between 2007/08 and 2008/09 approximately 57,000 cows were lost to the national herd whilst the recent decline in average milk yield was halted with the average yield increasing by 16 litres per cow; milk producers continued to leave the industry with 419 dairy farmers exiting the sector
- In 2008/09, total milk deliveries undershot the national milk quota by 1300 million litres
- Farm Business Survey data from 2008/09 shows that the average Farm Business Income (FBI) from dairying was £591/ha, an increase of 28% on the previous year; at the average farm size this equates to an FBI of approximately £70,500
- Average FBI on lowland farms was £630/ha (up from £499/ha in 2007/08) compared to £444/ha (up from £363/ha in 2007/08) for LFA farms
- Management and Investment Income (MII) in dairy farming increased from £186/ha in 2007/08 to £281/ha in 2008/09; this translates to an average MII of just over £33,500 per farm
- The specialist nature of smaller dairy farms resulted in a higher milk output and higher variable and fixed costs than larger farms and their increased reliance on family labour resulted in a lower MII than for the two larger size groups presented; the smallest size group achieved a MII of -£21/ha
- Lowland farms in the North and West showed a greater degree of specialisation; the West recorded the highest FBI (£707/ha) with the North and East recording FBI of £659/ha and £484/ha respectively
- Profitability analysis reveals that the upper quartile group has the lowest average farm size (102.36ha; cf 129.59ha, lowest quartile); FBI for the upper quartile was £1313/ha compared to £144/ha for the lower quartile
- Milk output increased by 25% for the upper quartile farms but only by 7% for the lower quartile farms
- As was found for lowland farms, LFA farms within the largest size group presented (greater than 120 hectares) operate a less intensive input-output system; farms from within the largest size group recorded the lowest average FBI per hectare (£374/ha) but when scaled up, recorded the highest total FBI per farm (£77,000)
- Regional analysis shows that LFA farms in the West function at a higher input-output level than those in the North and both regions recorded higher MII in 2008/09 than in the previous year; FBI returns also increased in both regions with the North and West achieving average per hectare returns of £347 and £625 respectively, generating average farm-level returns of £47,000 in the North and £61,500 in the West
- The upper quartile is characterised by the inclusion of smaller average size farms, whilst the average area of farms for the lower quartile was 181.09ha, for the upper quartile it was 78.15ha; however, the upper quartile achieved a higher total farm output (+256%) than the lesser performing farms

- The lower quartile recorded a MII of -£51/ha, whereas the equivalent measure for the upper quartile was £438/ha; at the average farm sizes, the upper and lower quartiles generated FBI returns of £81,000 and £17,700 respectively
- Enterprise-level analysis reveals that as a result of an increase in the average price of milk of 4.8ppl (lowland herds +4.3ppl; LFA herds +3.9ppl), dairy farms increased their output from milk by £302/cow; gross margins for all farms, lowland and LFA farms increased by £143/cow, £158/cow and £81/cow respectively
- For lowland herds, as herd size increases, so do the average yield/cow, milk output/cow, total variable costs/cow and total gross margin/cow. However, the smallest herd size (less than 80 cows), with its relatively low input-output system, achieved the highest gross margin per litre at 14.5ppl, compared to 14.0ppl and 14.3ppl for the 80 to 130 cows group and the greater than 130 cows groups, respectively
- Regional analysis of lowland herds shows that dairy farms in the East are typically more intensive in their production; the West, as a result of a higher average milk price and lower total variable costs, achieved the highest gross margin per cow (£1068/cow; East, £1062/cow; North £928/cow)
- Lowland farms in the upper quartile produced on average 2514 litres per cow more than its lower quartile counterparts; average milk prices for the upper quartile exceeded those of the lower quartile by 1.7ppl
- Concentrate to milk conversion rates of 6.6ppl and 8.6ppl were recorded for the upper and lower quartile farms respectively, whilst gross margin per litre results were 16.84ppl (upper quartile) and 10.64ppl (lower quartile)
- LFA enterprise herd-size analysis reveals that LFA farms achieved lower gross margins per cow than comparably sized lowland herds, through a combination of lower yields, lower milk prices and higher total variable costs
- Average herd size and average yields have increased in the North, whereas they have both declined in the West; the North achieved a greater average milk yield (+629 litres per cow), higher milk output (+£152/cow) but incurred higher total variable costs (+£257/cow) than the West, producing gross margin results for the North and West were £769/cow and £878/cow, respectively
- Gross margin performance quartile analysis of LFA farms reveals that the better performers have larger herds and achieve substantially higher yields (+2354 litres per cow) and receive higher milk prices; leading to a wide disparity between the two groups in gross margin per cow achieved of more than £600/cow
- This report confirms the findings of previous reports in this series, that the more profitable performers operate larger herds, with relatively high input-output systems and highlights the marked differences in economic returns and technical efficiency between the top and bottom performers
- Despite the continuing upturn in economic performance in the dairy sector, the industry as a whole continues to down-size with returns on tenant's capital being still quite low and with many dairy farmers facing the prospect of significant investments to be environmentally compliant and economically competitive; with tenancy succession and farmer age profile issues, it seems certain that the industry is set for more re-structuring in the future

## Chapter 1: The Dairying Sector

### 1.1: Introduction

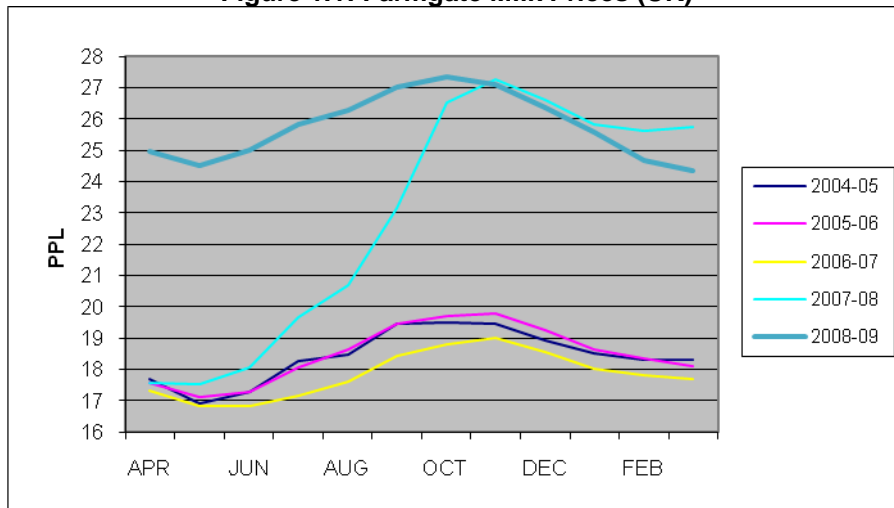
The 2008/09 milk year saw a continuation of the improved milk prices which began in the summer of 2007. These relatively high prices were sustained throughout 2008/09, leading to significant increases in milk output, which in turn resulted in notable rises in incomes. However, this period also witnessed large increases in feed, fertiliser and energy costs which eroded a sizeable proportion of the income gains. Despite the improved economic conditions, annual milk production and the national herd size continued to decline. Drawing upon information from a range of published sources together with analysis of data from the Farm Business Survey 2008/09, *Dairy Farming in England*, provides a contemporary analysis of the performance of dairy farms, and dairy production, in England for the 2008/09 financial year. The purpose of this introductory section of the report is to set out the market environment and key factors affecting the sector during this financial year. Specifically, this section of the report gives an overview of the UK dairying sector, focusing on:

- farmgate milk prices
- input prices
- annual milk production
- UK dairy herd and average milk yield
- producer numbers
- milk deliveries and national quota

### 1.2: Farmgate Milk Prices

Figure 1.1 shows the average producer ex-farmgate milk price (including seasonality; net of delivery charges) for the 2008/09 milk year. It should be remembered that the range of prices paid to producers is probably wider than at any time since the milk market's deregulation in 1994, with supermarket initiatives and premium prices being paid for dedicated supply contracts raising the bar and thus widening the gap between the top and bottom prices being paid. The price curve for 2008/09 followed the usual trend that reflects seasonality payments but at a consistently higher level than has been experienced in recent years. The average price during 2008/09 was 25.75 pence per litre (ppl), compared to 22.85 ppl in 2007/08 and 17.84 ppl in 2006/07. Major factors behind these historically high prices were the continuing tightness of milk supplies (see Figure 1.3) and processor-led incentives to encourage dairy farmers to remain in the industry.

Figure 1.1: Farmgate Milk Prices (UK)

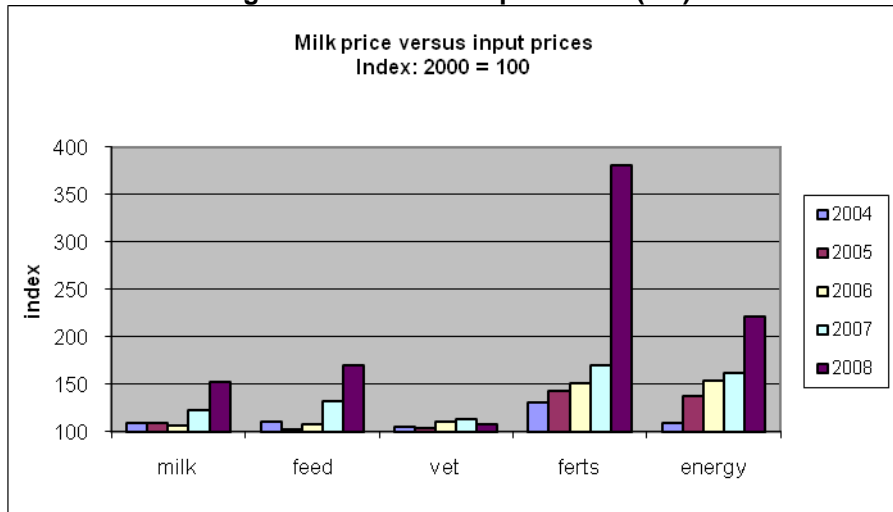


Source: Defra (2010a), Milk Price Surveys

### 1.3: Input Prices

Figure 1.2 shows the trends in farmgate milk prices and the prices of some key dairying inputs from 2004 to 2008, using the year 2000 as the base year (index = 100). It is clear that in 2008 the notable increase in the milk price (+53%, compared to 2000 prices), was accompanied by significant increases in the prices of feed (+70%), fertilisers (+281%) and fuels (+121%). Figure 1.2 also reveals the extent to which the increased milk price in 2008 (+37.5%) compared to 2007, was severely undermined by large increases in the prices of feeds, fertilisers and fuels of 28.0%, 123.6% and 36.6% respectively.

**Figure 1.2: Milk and Input Prices (UK)**

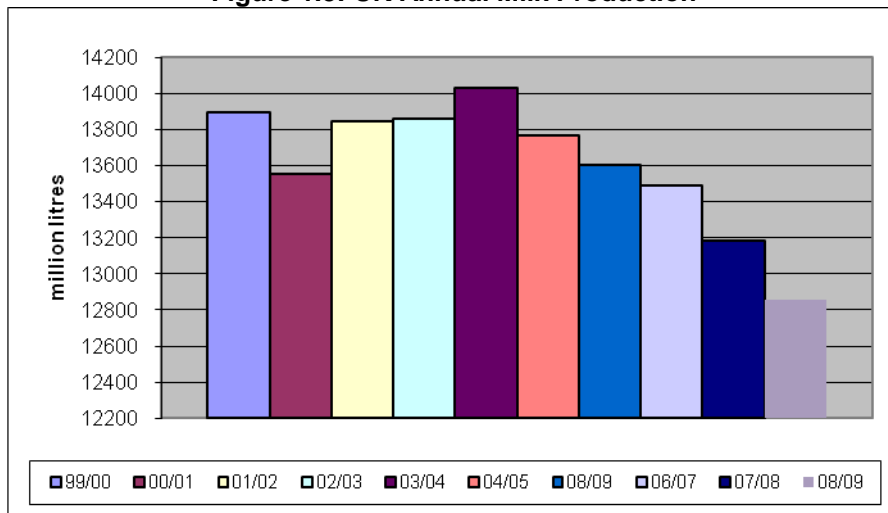


Source: Defra (2010b); Agriculture in the UK 2008

### 1.4: Annual Milk Production

Figure 1.3 shows annual milk production in the UK (defined as wholesale deliveries) for the years 1999/00 to 2008/09. In 2008/09, milk production fell to its lowest point for 37 years with 12858 million litres being produced. This represents a decrease of 2.5% from the 2007/08 level and is 8.4% lower than the amount produced in 2004/05. The major contributory factor to this continued decline in production was the further decline in the size of the national herd, although as can be seen in the following section, the recent trend of declining average yield per cow was reversed and so prevented annual production from decreasing to even lower levels.

**Figure 1.3: UK Annual Milk Production**



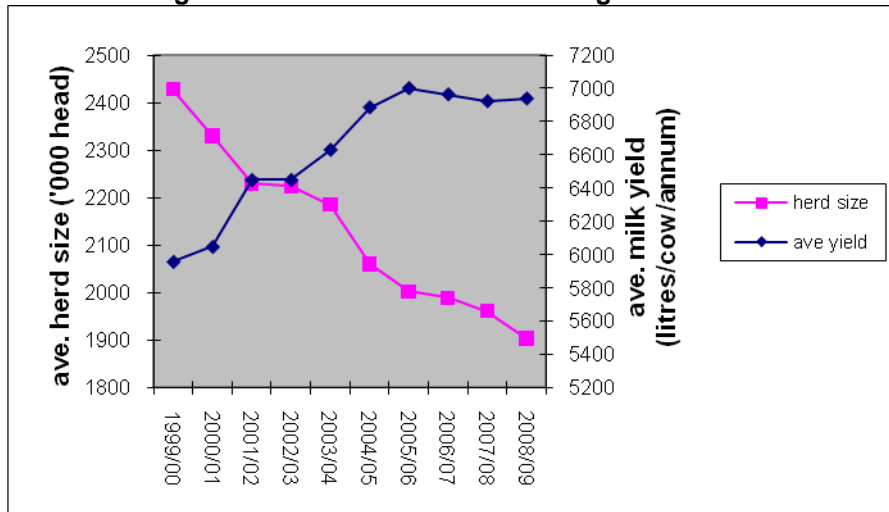
Source: MDC Datum (2010a)

### 1.5: UK Dairy Herd and Average Milk Yield

As mentioned in the previous section, the two key factors that have contributed to the fall in UK milk production in recent years are the reduced size of the national herd and lower average yields per cow. Figure 1.4 illustrates the ten year trend in these two important production related factors. It can be observed that in 2008/09, the national herd size decreased by 2.9% (approximately 57000 cows). This means that in the last ten years 524000 (21.6%) cows have been lost to the national herd. The 2008/09 year saw a continuation of recent high herd replacement costs and cull cow prices, which coupled with, for many dairy farmers, the prospect of having to invest highly to conform to Nitrate Vulnerable Zone requirements, provided more impetus to producer-exits from the industry and therefore a smaller national herd. It is important to note that as producers go out of business, not all of their cows are re-cycled back into the national herd, with about one-fifth being culled due to poor productivity, age and health related factors.

The recent two-year trend in declining average milk yield per cow was reversed in 2008/09, albeit by only 16 litres per cow (lpc), to give an average yield of 6939 lpc. This level of production was 62 lpc lower than the recent high level (2005/06) of 7001 lpc.

**Figure 1.4: UK Herd Size and Average Milk Yield**

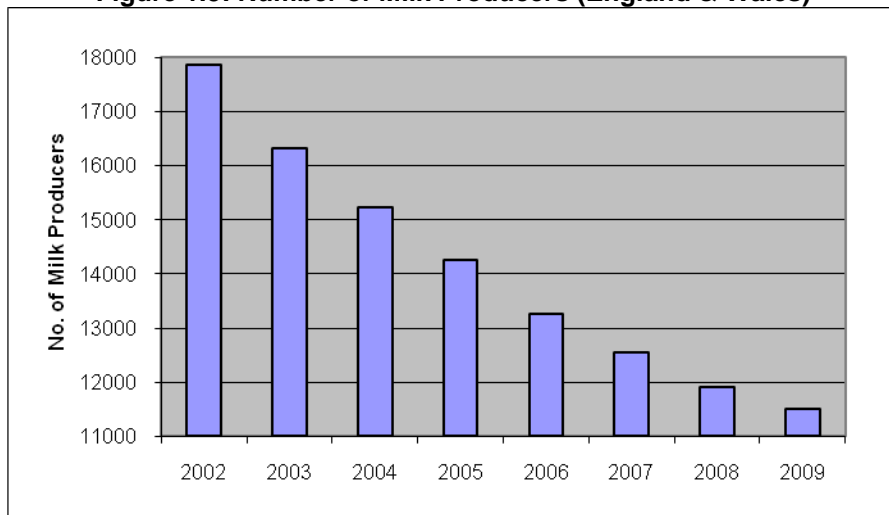


Source: MDC Datum (2010b)

### 1.6: Producer Numbers (England & Wales)

Figure 1.5 shows the continuing trend of the fall in the number of milk producers in England and Wales. Between 2007/08 and 2008/09, 419 (3.5%) milk producers withdrew from dairying, which was the smallest decrease in recent years, with the percentage decreases from 2002 to 2008 being 8.7%, 6.7%, 6.4%, 6.9%, 5.4% and 5.1% respectively. Between 2002 and 2009, 6357 producers ceased milk production, representing a fall of 35.6%.

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

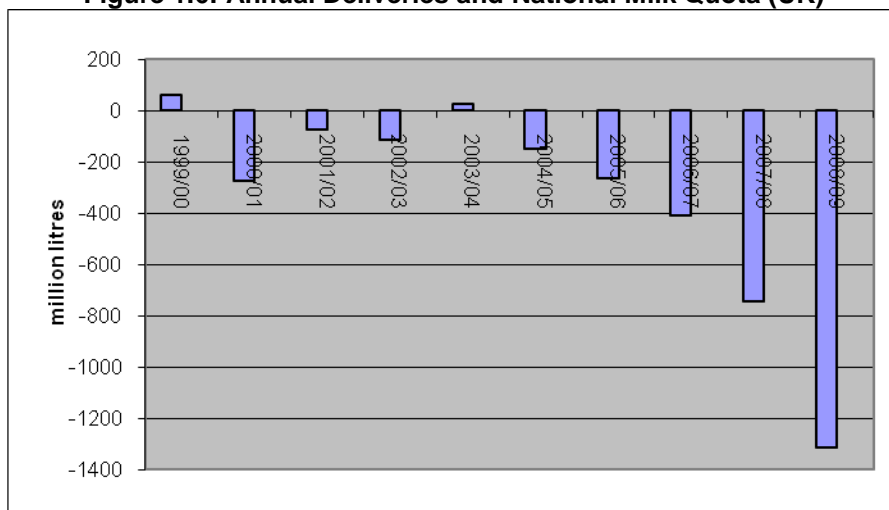


Source: MDC Datum (2010c)

### 1.7: Milk Deliveries and Quota

Figure 1.6 illustrates the widening gap between total milk deliveries (butterfat adjusted) and total national milk quota. In 2008/09 total deliveries undershot the national milk quota by 1300 million litres which equated to 9.1% of unused quota. As previously mentioned, the decline in the size of the national herd, coupled with only a very small increase in average yield per cow, was the major driving force for the increased gap between production and quota but it should be noted that the picture has been distorted somewhat due to the national allocation of additional quota that amounted to +2.5%. The difference between supply and quota has taken its toll on the value of milk quota with the 2008/09 average price being 0.5 ppl compared to the prices for 2005/06, 2006/07 and 2007/08 which were 15.2ppl, 5.9ppl and 2.1ppl respectively.

**Figure 1.6: Annual Deliveries and National Milk Quota (UK)**



Source: MDC Datum (2010d)

## **1.8: Structure of Report**

The above sections have described the market environment in which the dairy sector has been operating during the 2008/09 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 4 discusses the results of the analysis in context of previous research and identifies the main performance drivers in Dairy Farming in England.

## 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 2008/09 for those farms classed as Dairy Farms<sup>1</sup> and relate to the outputs, inputs and returns to each farm, together with total farm area and farm size data. For a sub-set of these results data is available at the enterprise level to produce output, variable input and Gross Margin (GM) data (total dairy output minus variable costs) together with cow numbers and physical yield (litres per cow). Table 2.1 below details the number of observations for the per hectare farm results, in each category by farm type (Lowland and Less Favoured Area (LFA)), by EU super region (North, East, West; see figure 2.1), by farm size categories, 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 (Lowland and LFA), by EU super region (North, East, West), by herd size categories, by lower and upper performance quartiles.

**Table 2.1: Observations by Category: Farm-Level Data 2008/09**

Category		Lowland	LFA
Number of farms		250	71
EU Super Region	North	62	42
	East	60	Ins. data
	West	128	19
Farm Size	<60 hectares	41	18
	60-120 hectares	105	24
	>120 hectares	104	29
Performance Quartile	Lower quartile	63	18
(by FBI)	Upper quartile	63	18

FBI = Farm Business Income: Ins. data = Insufficient data available (<15 observations)

<sup>1</sup> Holdings on which dairy cows account for more than two thirds of the total Standard Gross Margin 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. See [http://statistics.defra.gov.uk/esg/asd/fbs/reference/farm\\_classification.pdf](http://statistics.defra.gov.uk/esg/asd/fbs/reference/farm_classification.pdf)

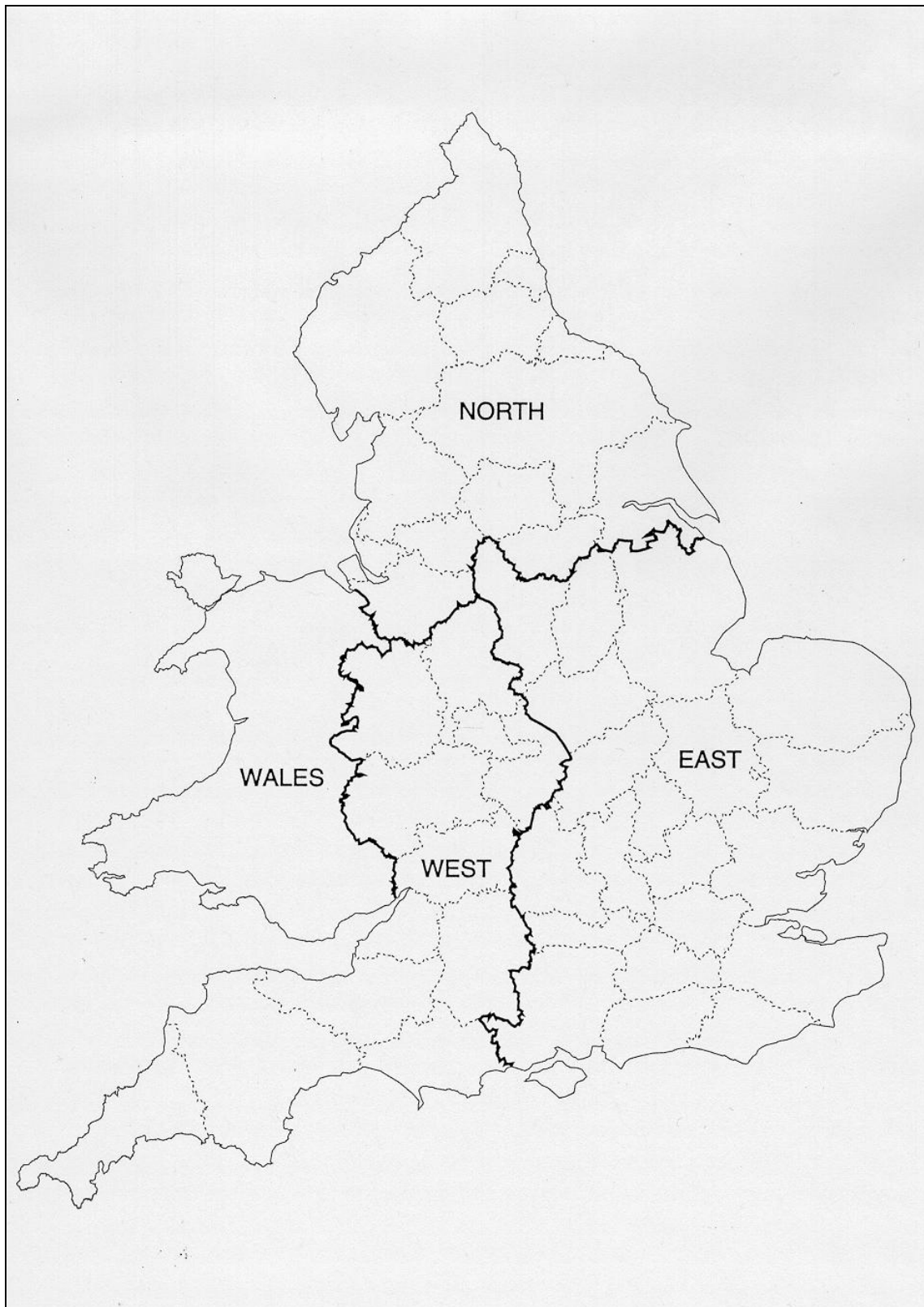
**Table 2.2: Observations by Category: Enterprise-Level Data 2008/09**

Category		Lowland	LFA
Number of farms		231	70
EU Super Region	North	61	42
	East	54	Ins. Data
	West	116	18
Farm Size	<80 cows	60	35
	80-130 cows	81	23
	>130 cows	90	Ins. Data
Performance Quartile	Lower quartile	58	18
(by Gross Margin)	Upper quartile	58	18

Ins. data = Insufficient data available (<15 observations).

## 2.2: Methodology

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



**Figure 2.1: The EU Super Regions of England and Wales**

## Chapter 3: Results

### 3.1: All farms

Table 3.1 presents the results of the outputs, inputs, and margins from dairy farms in England on a per hectare (ha) basis for 2007/08 and 2008/09. The table details the results for all farms, together with results for lowland and less favoured area (LFA) farms being considered separately. The results for all farms show that for 2008/09, Farm Business Income (FBI) is £591 per hectare, which at the average farm size provides an average FBI of approximately £70,500; an increase of 28% on the 2007/08 figure. This increase in FBI builds on the substantial increase in FBI that occurred between 2006/07 and 2007/08 (Robertson and Wilson, 2009). Turning to Management and Investment Income (MII), the value of farmer and spouse labour increased slightly to £217/ha, resulting in a MII of £281/ha, which is the economic return after accounting for the value of labour and owned land. This compares to the 2007/08 MII of £186 per hectare. Therefore, in 2008/09, average MII on dairy farms in England is just over £33,500, compared to just under £22,000 in 2007/08. Examining the breakdown of returns and costs for 2008/09, milk sales of £1993/ha, represented an increase of 19.4% on the previous year. Total variable costs of £1126/ha in 2008/09, represent an increase of 22%; in addition to the 27% increase in 2007/08. Once again, the cost of purchased concentrates increased significantly (+31%) with fertiliser costs also showing a very substantial increase of 42%; up from £71/ha in 2007/08 to £101/ha in 2008/09. Fixed costs in 2008/09 were 10% (£100/ha) higher than in 2007/08 with all the cost categories showing increases on the previous year (labour (6%), contract (17%), machinery depreciation (9%), other machinery costs (17%)). Labour (including farmer and spouse labour) as a percentage of total output, followed the recent downward trend by accounting for 18% of total farm output, compared to 24% and 20% in 2006/07 and 2007/08 respectively.

### 3.2: Comparison of Lowland and Less Favoured Area (LFA) farms

Table 3.1 additionally shows the performance of lowland versus LFA dairy farms. Both these groups show increases in their average farm size in 2008/09 but in line with previous years, they still maintain broadly similar size structures, making for interesting group comparisons regarding inputs and outputs. In 2008/09, lowland dairy farms returned, on average, a total farm output some £914/ha greater than the LFA group. Milk output on lowland farms, as a percentage of total output, increased slightly to 73% (*cf.* 71%; 2007/08), whilst for LFA farms this figure remained at 68%. Although the lowland group achieved a higher output of £914/ha, it also incurred greater variable and fixed costs which were, respectively, £321/ha and £402/ha greater than for the LFA group. Despite the significant differences in the cost structures of the two groups, with lowland farms operating at a much higher cost level than LFA farms, the additional output achieved by the lowland group resulted in it achieving an FBI of £630/ha in comparison to £444/ha for the LFA group. These 2008/09 levels of FBI equate to improvements on 2007/08 levels of £131/ha for lowland farms and £81/ha for LFA farms, which means that at the average farm size, average FBI is just over £74,500 for lowland farms and just over £54,500 for LFA farms. Taking into account values for farmer and spouse labour and owned land, the respective MII for lowland and LFA farms are approximately £37,600 and £17,500.

**Table 3.1: Outputs, Inputs and Margins for All Farms, Lowland and LFA**

	All Farms		All Lowland		All LFA	
	07/08	08/09	07/08	08/09	07/08	08/09
Number of farms	296	321	229	250	67	71
Area (Ha)	116.79	119.37	116.64	118.37	117.39	123.28
	<i>£/ha</i>		<i>£/ha</i>		<i>£/ha</i>	
<b>Output</b>						
Milk	1669	1993	1796	2152	1157	1396
Calf	61	75	64	77	50	65
Lease Quota (net)	0	0	0	0	0	0
Other Dairy	0	0	0	0	1	0
Herd Replacement	-150	-171	-161	-183	-107	-125
<b>Total Dairy Output</b>	<b>1579</b>	<b>1897</b>	<b>1699</b>	<b>2046</b>	<b>1102</b>	<b>1336</b>
Other Livestock	344	443	354	454	304	402
Other	443	431	482	463	288	310
<b>Total Farm Output</b>	<b>2366</b>	<b>2770</b>	<b>2534</b>	<b>2962</b>	<b>1694</b>	<b>2048</b>
<b>Variable Costs</b>						
Home-grown						
Concentrates	53	45	60	49	27	29
Purchased						
Concentrates	462	607	485	638	368	487
Coarse Fodder	36	36	38	36	27	40
Other Livestock						
Concentrates	13	13	15	14	6	6
Vet and Medicine	70	80	74	83	56	69
Other Livestock Costs	161	180	172	190	117	144
Seed	19	25	23	30	5	6
Fertiliser	71	101	75	108	55	74
Crop Protection	20	23	23	27	6	9
Other Crop Costs	15	17	17	19	8	9
<b>Total Variable Costs</b>	<b>920</b>	<b>1126</b>	<b>982</b>	<b>1194</b>	<b>676</b>	<b>873</b>
<b>Fixed Costs</b>						
Labour	261	278	280	298	186	203
Contract	107	125	119	138	59	76
Machinery						
Depreciation	124	135	133	146	90	94
Other Machinery	132	159	137	167	108	131
Miscellaneous	202	223	214	238	153	165
Rent and Rental						
Equivalent	220	227	238	245	149	160
<b>Total Fixed Costs</b>	<b>1046</b>	<b>1146</b>	<b>1121</b>	<b>1231</b>	<b>744</b>	<b>829</b>
<b>Net Farm Income</b>	<b>400</b>	<b>498</b>	<b>431</b>	<b>538</b>	<b>274</b>	<b>347</b>
Farmer / Spouse						
Labour	214	217	218	220	197	204
<b>Management &amp; Investment Income</b>	<b>186</b>	<b>281</b>	<b>213</b>	<b>318</b>	<b>77</b>	<b>142</b>
<b>Farm Business Income (FBI)</b>	<b>472</b>	<b>591</b>	<b>499</b>	<b>630</b>	<b>363</b>	<b>444</b>

### 3.3: Lowland: Influence of Farm Size

The results of the three lowland size groups are presented in Table 3.2. The specialist nature of smaller farms, as noted in the previous three editions of this report, is again in evidence in 2008/09. The less than 60 hectares group recorded the highest total farm output per hectare (£3341/ha), the highest milk output (£2473/ha), the highest variable costs (£1417/ha) and the highest fixed costs (£1321/ha). The high degree of specialisation found in this group does not translate into higher levels of income when compared to the other two larger size groups. In terms of MII, the less than 60 hectares group achieved a MII of minus £21 per hectare, compared to the 60 to 120 hectares and greater than 120 hectares groups which achieved £304/ha and £368/ha respectively. However, this level of MII is a significant improvement on the 2007/08 performance (minus £115/ha). When examining the three groups by FBI performance, a different picture emerges with the greater than 120 hectares group recording the lowest FBI (£571/ha) in comparison to the less than 60 hectares group (£702/ha) and the 60 to 120 hectares group (£731/ha). The critical factor here is the great reliance on farmer and spouse labour found amongst farms in the less than 60 hectares group. For the less than 60 hectares group, farmer and spouse labour is £623/ha, contrasting sharply with the two other groups which show respective contributions of £302/ha and £128/ha for the 60 to 120 hectares and greater than 120 hectares groups. In terms of farm-level FBI the range across the three size groups is noteworthy, with the less than 60 hectares group achieving a FBI of just over £30,500, compared to that of the 60 to 120 hectares group and the greater than 120 hectares group which achieved just over £64,000 and slightly less than £111,000 respectively.

### 3.4: Lowland: Influence of Region

Table 3.3 presents outputs, inputs and margins for lowland dairy farms across the three EU super regions. The greater degree of specialisation in dairying in the North and West, as noted in 2007/08 (Robertson and Wilson, 2009) is again indicated by the amount of total output that is derived from milk output. For the North and West regions, milk output comprises 75% and 73% of total output, respectively, whereas for the East, 70% of total output comes from milk. The range in total variable costs across the three regions is notable, with the North recording the highest variable costs (£1380/ha) and the East recording the lowest (£1039/ha). Examining individual variable costs from the North and West reveals significant differences in expenditure for purchased concentrates, other livestock costs and fertiliser, with the North incurring +£211/ha, +£53/ha and +£46/ha for these three cost categories, compared to the East. In contrast to variable costs, all three regions show similar levels of fixed costs. The highest FBI is found in the West (£707/ha), followed by the North (£659/ha) and the East (£484/ha), which is a repeat of the order recorded in 2007/08. These levels of FBI when compared to 2007/08 FBI performance are equal in percentage terms to the West (+25%), North (+35%) and East (+22%).

### 3.5: Lowland: Comparison by Profitability Quartiles

It is notable that the upper quartile has the lowest average farm size (102.36ha) compared to that of the lower quartile (129.59ha). The upper quartile achieved a substantially greater total farm output (£4078/ha) than the lower quartile (£2293/ha). The upper quartile also shows higher levels of total variable costs (£1570/ha) and total fixed costs (£1401/ha) compared to the lower quartile's respective costs of £980/ha and £1167/ha, resulting in an average FBI of £1313/ha, in contrast to the lower quartile's £144/ha. At the average farm sizes noted in Table 3.4, these FBI data translate to an average farm-level FBI of £134,400 for the upper quartile and £18,700 for the lower quartile. These levels of income represent an increase in average FBI, compared to 2007/08 levels of FBI, of £28,500 for upper quartile farms and £11,000 for lower quartile farms. The main driver for these increases in income is the increase in milk output. However there is a marked difference between the two quartile groups regarding the magnitude of this extra revenue derived from milk. For the upper quartile group, milk output increased by 25% between 2007/08 and 2008/09, whilst for the

lower quartile group the corresponding increase was 7%. Purchased concentrate costs for the upper quartile are £926/ha, whilst for the lower quartile they are £496/ha, which represent increases of 46% and 13% on 2007/08 for the two respective groups. In terms of MII, the lower quartile group achieved a negative MII despite the increased returns from milk. The upper quartile group retained £843/ha MII, compared to £619/ha in 2007/08. In 2008/09, the difference in FBI between the two groups widened from £1030/ha to £1169/ha.

**Table 3.2: Outputs, Inputs and Margins: Lowland by Farm Size**

<b>LOWLAND</b>	< 60 ha		60 – 120 ha		> 120 ha	
	07/08	08/09	07/08	08/09	07/08	08/09
Number of farms	41	41	91	105	97	104
Area (Ha)	42.72	43.57	85.75	88.04	195.32	193.94
	£/ha		£/ha		£/ha	
<b>Output</b>						
Milk	2135	2473	1918	2367	1694	2004
Calf	92	121	82	94	52	64
Lease Quota (net)	-1	0	0	0	0	0
Other Dairy	0	0	0	0	0	0
Herd Replacement	-200	-233	-186	-188	-144	-174
<b>Total Dairy Output</b>	<b>2026</b>	<b>2361</b>	<b>1813</b>	<b>2273</b>	<b>1601</b>	<b>1894</b>
Other Livestock	440	537	390	508	325	417
Other	436	442	430	400	512	496
<b>Total Farm Output</b>	<b>2902</b>	<b>3341</b>	<b>2633</b>	<b>3181</b>	<b>2438</b>	<b>2806</b>
<b>Variable Costs</b>						
Home-grown						
Concentrates	36	44	35	40	74	54
Purchased						
Concentrates	638	797	517	714	450	581
Coarse Fodder	38	31	39	41	37	33
Other Livestock						
Concentrates	15	13	18	32	13	5
Vet and Medicine	96	97	72	87	71	79
Other Livestock Costs	225	249	179	209	162	173
Seed	12	19	21	26	25	33
Fertiliser	90	135	76	103	73	107
Crop Protection	10	11	15	17	29	33
Other Crop Costs	23	21	18	19	16	19
<b>Total Variable Costs</b>	<b>1184</b>	<b>1417</b>	<b>990</b>	<b>1290</b>	<b>950</b>	<b>1118</b>
<b>Fixed Costs</b>						
Labour	190	222	276	306	294	303
Contract	122	150	127	151	115	130
Machinery						
Depreciation	184	197	130	147	127	138
Other Machinery	160	198	129	157	138	168
Miscellaneous	283	295	237	265	193	218
Rent and Rental						
Equivalent	255	260	251	258	230	236
<b>Total Fixed Costs</b>	<b>1195</b>	<b>1321</b>	<b>1151</b>	<b>1285</b>	<b>1097</b>	<b>1193</b>
<b>Net Farm Income</b>	<b>523</b>	<b>602</b>	<b>492</b>	<b>606</b>	<b>390</b>	<b>496</b>
Farmer / Spouse						
Labour	638	623	301	302	122	128
<b>Management &amp; Investment Income</b>	<b>-115</b>	<b>-21</b>	<b>192</b>	<b>304</b>	<b>268</b>	<b>368</b>
<b>Farm Business Income (FBI)</b>	<b>586</b>	<b>702</b>	<b>579</b>	<b>731</b>	<b>449</b>	<b>571</b>

**Table 3.3: Outputs, Inputs and Margins: Lowland by EU Super Region**

LOWLAND	North		East		West	
	07/08	08/09	07/08	08/09	07/08	08/09
Number of farms	59	62	55	60	115	128
Area (Ha)	98.48	108.86	148.38	147.26	112.48	109.73
	£/ha		£/ha		£/ha	
<b>Output</b>						
Milk	1845	2381	1521	1867	1939	2211
Calf	66	86	49	58	72	85
Lease Quota (net)	0	0	0	0	0	0
Other Dairy	0	0	0	0	0	0
Herd Replacement	-183	-236	-87	-130	-195	-189
<b>Total Dairy Output</b>	<b>1728</b>	<b>2231</b>	<b>1482</b>	<b>1795</b>	<b>1816</b>	<b>2107</b>
Other Livestock	322	479	264	365	424	498
Other	484	468	548	506	440	432
<b>Total Farm Output</b>	<b>2533</b>	<b>3178</b>	<b>2294</b>	<b>2666</b>	<b>2680</b>	<b>3037</b>
<b>Variable Costs</b>						
Home-grown						
Concentrates	62	53	52	38	63	54
Purchased						
Concentrates	519	759	428	548	503	632
Coarse Fodder	52	51	43	39	28	25
Other Livestock						
Concentrates	1	1	4	4	28	28
Vet and Medicine	85	101	63	71	74	81
Other Livestock Costs	178	222	157	169	179	187
Seed	18	23	23	34	26	31
Fertiliser	86	128	60	82	78	113
Crop Protection	17	22	27	32	24	26
Other Crop Costs	19	19	17	22	16	18
<b>Total Variable Costs</b>	<b>1038</b>	<b>1380</b>	<b>872</b>	<b>1039</b>	<b>1020</b>	<b>1194</b>
<b>Fixed Costs</b>						
Labour	250	282	288	291	290	310
Contract	99	135	117	144	131	135
Machinery						
Depreciation	146	152	112	132	138	150
Other Machinery	128	162	138	166	142	170
Miscellaneous	219	238	212	242	212	235
Rent and Rental						
Equivalent	226	245	211	219	261	261
<b>Total Fixed Costs</b>	<b>1069</b>	<b>1214</b>	<b>1078</b>	<b>1195</b>	<b>1174</b>	<b>1263</b>
<b>Net Farm Income</b>	<b>426</b>	<b>584</b>	<b>344</b>	<b>432</b>	<b>487</b>	<b>581</b>
Farmer / Spouse						
Labour	212	210	182	174	242	255
<b>Management &amp; Investment Income</b>	<b>214</b>	<b>374</b>	<b>162</b>	<b>258</b>	<b>244</b>	<b>326</b>
<b>Farm Business Income (FBI)</b>	<b>487</b>	<b>659</b>	<b>398</b>	<b>484</b>	<b>565</b>	<b>707</b>

**Table 3.4: Outputs, Inputs and Margins: Lowland by Profitability Quartiles**

<b>LOWLAND</b>	Lower quartile		Upper quartile	
	<i>07/08</i>	<i>08/09</i>	<i>07/08</i>	<i>08/09</i>
Number of farms	57	63	57	63
Area (Ha)	120.98	129.59	96.43	102.36
	£/ha		£/ha	
<b>Output</b>				
Milk	1416	1521	2556	3201
Calf	55	54	95	107
Lease Quota (net)	-1	0	0	0
Other Dairy	0	0	0	0
Herd Replacement	-160	-151	-191	-243
<b>Total Dairy Output</b>	<b>1309</b>	<b>1424</b>	<b>2460</b>	<b>3065</b>
Other Livestock	329	353	422	606
Other	460	517	470	407
<b>Total Farm Output</b>	<b>2098</b>	<b>2293</b>	<b>3352</b>	<b>4078</b>
<b>Variable Costs</b>				
Home-grown Concentrates	46	57	47	38
Purchased Concentrates	438	496	634	926
Coarse Fodder	32	27	42	57
Other Livestock				
Concentrates	23	6	26	22
Vet and Medicine	69	63	98	109
Other Livestock Costs	165	157	204	230
Seed	25	34	22	27
Fertiliser	69	88	88	121
Crop Protection	21	29	23	22
Other Crop Costs	22	24	20	19
<b>Total Variable Costs</b>	<b>911</b>	<b>980</b>	<b>1203</b>	<b>1570</b>
<b>Fixed Costs</b>				
Labour	238	264	338	356
Contract	121	137	122	147
Machinery Depreciation	144	147	151	162
Other Machinery	130	160	148	186
Miscellaneous	218	235	231	261
Rent and Rental Equivalent	223	223	271	290
<b>Total Fixed Costs</b>	<b>1074</b>	<b>1167</b>	<b>1262</b>	<b>1401</b>
<b>Net Farm Income</b>	<b>113</b>	<b>146</b>	<b>887</b>	<b>1107</b>
Farmer / Spouse Labour	208	190	268	264
<b>Management &amp; Investment Income</b>	<b>-95</b>	<b>-44</b>	<b>619</b>	<b>843</b>
<b>Farm Business Income (FBI)</b>	<b>64</b>	<b>144</b>	<b>1094</b>	<b>1313</b>

### 3.6: LFA: Influence of Farm Size

Table 3.1 above provided the results for all less favoured area (LFA) farms. Table 3.5 presents the results of LFA dairy farms according to the three size groupings. Examining the input-output systems of the three size groupings, reveals that similarly to the findings for lowland farms, the greater than 120 hectares size group operates at a substantially lower level than the two other smaller size groups. The greater than 120 hectares group achieved the lowest total farm output (£1741/ha), compared to the less than 60 hectares and between 60 to 120 hectares groups which achieved total outputs of £2640/ha and £2730/ha respectively. Despite the higher milk prices achieved in 2008/09, the percentage of total output derived from milk sales decreased for the less than 60 hectares group (70% *cf.* 72% in 2007/08) and the 60 to 120 hectares group (75% *cf.* 77% in 2007/08). The greater than 120 hectares group's share of total output derived from milk remained at 64%. Total variable costs across all three size groupings increased considerably, largely driven by increases in the costs of purchased concentrates and fertiliser. All three size groupings also recorded higher total fixed costs with labour and machinery costs (primarily fuel) being responsible for these increases. In terms of MII returns, the pattern shown for lowland farms is repeated for LFA farms in that the lower input-output system (greater than 120 hectares group) achieved the highest MII (£170/ha), compared to the less than 60 hectares group (minus £80/ha) and the 60 to 120 hectares group (£150/ha). However, when taking farmer and spouse labour into account, the situation is reversed with the greater than 120 hectares group recording FBI of £374/ha, and the less than 60 hectares group and the 60 to 120 hectares group recording FBI of £641/ha and £573/ha, respectively. With reference to the average farm sizes noted in Table 3.5, average FBI returns are approximately £26,500, £50,000 and £77,000 across the less than 60 hectares, 60 to 120 hectares and greater than 120 hectare groups respectively.

### 3.7: LFA: Influence of Region

Table 3.6 presents the LFA dairy farm results by EU super region. Insufficient observations exist for the East region to present results. Compared with 2007/08, in 2008/09, the average farm size in the North has remained virtually the same, whilst in the West it increased by approximately 10 hectares. As noted for 2006/07 and 2007/08, the West is notable for its higher input-output system than the North. Both regions recorded higher total farm outputs in 2008/09 (North £1852/ha; West £2106/ha); increases that were driven by higher returns from milk. In contrast to 2006/07 and 2007/08, the West did not record higher total variable costs than the North, although when added to total fixed costs, total costs were higher in the West. Total variable costs in the North increased by 40%; largely due to a substantial increase in expenditure on purchased concentrates (42%). In the West, a smaller increase in feed costs (11%) contributed to an increase in total variable costs of 6%. The average MII for LFA farms in the North increased by £15/ha to £92/ha, whilst in the West, farms returned a MII of £179/ha; an increase of £109/ha. Significant to the differing increases in MII for the two regions, is the £24/ha decrease in the value of farmer and spouse labour for farms in the West, whereas in the North farmer and spouse labour increased by £27/ha. At FBI level, the average per hectare returns are £347 and £625 for the North and West respectively, generating average farm-level FBI returns of £47,000 for the North and £61,500 for the West.

**Table 3.5: Outputs, Inputs and Margins: LFA by Farm Size**

LFA	< 60 ha		60 – 120 ha		> 120 ha	
	07/08	08/09	07/08	08/09	07/08	08/09
Number of farms	19	18	20	24	28	29
Area (Ha)	44.65	41.55	80.02	87.17	209.09	205.83
	£/ha		£/ha		£/ha	
<b>Output</b>						
Milk	1657	1856	1672	2037	923	1120
Calf	101	107	71	102	35	47
Lease Quota (net)	0	0	0	0	0	0
Other Dairy	0	0	7	0	0	0
Herd Replacement	-174	-175	-132	-178	-88	-101
<b>Total Dairy Output</b>	<b>1584</b>	<b>1788</b>	<b>1618</b>	<b>1962</b>	<b>870</b>	<b>1066</b>
Other Livestock	385	434	310	466	286	377
Other	336	419	241	303	292	298
<b>Total Farm Output</b>	<b>2305</b>	<b>2640</b>	<b>2168</b>	<b>2730</b>	<b>1449</b>	<b>1741</b>
<b>Variable Costs</b>						
Home-grown Concentrates	26	22	22	30	29	30
Purchased Concentrates	510	596	527	684	298	406
Coarse Fodder	38	26	33	51	23	38
Other Livestock Concentrates	0	0	0	0	8	9
Vet and Medicine	67	70	65	95	52	61
Other Livestock Costs	197	232	131	214	98	109
Seed	5	4	4	6	6	7
Fertiliser	82	103	71	92	46	64
Crop Protection	5	5	5	9	6	9
Other Crop Costs	10	10	11	13	7	7
<b>Total Variable Costs</b>	<b>940</b>	<b>1069</b>	<b>870</b>	<b>1195</b>	<b>572</b>	<b>738</b>
<b>Fixed Costs</b>						
Labour	186	206	163	204	193	202
Contract Machinery	81	85	73	97	50	67
Depreciation	135	150	118	132	73	74
Other Machinery	149	181	98	158	103	116
Miscellaneous	259	280	179	240	126	124
Rent and Rental Equivalent	205	192	173	221	131	135
<b>Total Fixed Costs</b>	<b>1016</b>	<b>1094</b>	<b>804</b>	<b>1052</b>	<b>676</b>	<b>719</b>
<b>Net Farm Income</b>	<b>349</b>	<b>478</b>	<b>494</b>	<b>483</b>	<b>200</b>	<b>284</b>
Farmer / Spouse Labour	509	558	335	333	100	114
<b>Management &amp; Investment Income</b>	<b>-160</b>	<b>-80</b>	<b>159</b>	<b>150</b>	<b>100</b>	<b>170</b>
<b>Farm Business Income (FBI)</b>	<b>499</b>	<b>641</b>	<b>566</b>	<b>573</b>	<b>283</b>	<b>374</b>

**Table 3.6: Outputs, Inputs and Margins: LFA by EU Super Region**

LFA	North		East		West	
	07/08	08/09	07/08	08/09	07/08	08/09
Number of farms	39	42	<i>Insufficient data</i>		17	19
Area (Ha)	135.29	135.81			88.90	98.41
	£/ha		£/ha		£/ha	
<b>Output</b>						
Milk	943	1218			1395	1465
Calf	40	56			74	77
Lease Quota (net)	0	0			0	0
Other Dairy	1	0			0	0
Herd Replacement	-89	-114			-154	-150
<b>Total Dairy Output</b>	<b>895</b>	<b>1160</b>			<b>1315</b>	<b>1392</b>
Other Livestock	299	391			324	414
Other	285	302			301	300
<b>Total Farm Output</b>	<b>1478</b>	<b>1852</b>			<b>1939</b>	<b>2106</b>
<b>Variable Costs</b>						
Home-grown						
Concentrates	22	28			43	33
Purchased						
Concentrates	318	453			390	433
Coarse Fodder	22	35			37	35
Other Livestock						
Concentrates	9	10			0	0
Vet and Medicine	53	70			50	56
Other Livestock Costs	102	140			126	116
Seed	5	5			6	9
Fertiliser	46	72			64	73
Crop Protection	5	8			5	8
Other Crop Costs	9	10			7	7
<b>Total Variable Costs</b>	<b>591</b>	<b>830</b>			<b>727</b>	<b>770</b>
<b>Fixed Costs</b>						
Labour	162	173			206	213
Contract	51	76			78	76
Machinery						
Depreciation	89	92			101	102
Other Machinery	104	132			89	118
Miscellaneous	131	141			176	186
Rent and Rental						
Equivalent	124	138			184	178
<b>Total Fixed Costs</b>	<b>660</b>	<b>753</b>			<b>835</b>	<b>873</b>
<b>Net Farm Income</b>	<b>227</b>	<b>269</b>			<b>377</b>	<b>462</b>
Farmer / Spouse Labour	150	177			307	283
<b>Management &amp; Investment Income</b>	<b>77</b>	<b>92</b>			<b>70</b>	<b>179</b>
<b>Farm Business Income (FBI)</b>	<b>304</b>	<b>347</b>			<b>540</b>	<b>625</b>

### **3.8: LFA: Comparison by Profitability Quartiles**

Table 3.7 presents the analysis of LFA farms by profitability quartiles, as measured by FBI performance. A recurring theme of this analysis of profitability quartiles for LFA farms is the disparity between the average farm sizes of the upper and lower quartiles. The lower and upper quartile's average farm sizes in 2008/09 are 181.09 hectares and 78.15 hectares respectively. Despite this considerable difference in farm area, the upper quartile achieved a significantly higher total farm output (£3290/ha) than the lower quartile (£1284/ha). Output from milk differs markedly between the two groups, with the lower quartile recording £831/ha from milk returns, compared to the upper quartile which returned £2483/ha. Total variable costs increased for both quartile groups with the lower quartile's increasing by 42% to £617/ha and the upper quartile's increasing by 44% to £1314/ha. Concentrate costs increased for both groups, with the lower quartile incurring a 33% increase on 2007/08, whilst the respective increase for the upper quartile was 55%. The lower quartile incurred an increase of £48/ha for fixed costs between the two years, whilst fixed costs for the upper quartile increased by £226/ha. Significant to the comparatively large increase in fixed costs incurred by the upper quartile were notable increases in labour and property costs. Both quartile groups achieved increased MII returns in 2008/09 but despite the more favourable conditions enjoyed by the dairying industry, the lower quartile still did not record a positive MII return. For the lower quartile, the average MII was minus £51/ha (2007/08; minus £68/ha), whilst for the upper quartile MII returns were £438/ha (2007/08; £339/ha). In terms of FBI, the lower quartile achieved an FBI return of £98/ha, representing an increase of £52/ha on 2007/08, whilst the upper quartile achieved an FBI return of £1035/ha; an increase of £144/ha on 2007/08 returns. At the average farm sizes for these groups, the lower and upper quartiles achieved FBI returns of £17,700 and £81,000 respectively.

### **3.9: Further Analysis: Lowland and LFA by Region and Farm Size**

The above sections have provided analysis for lowland and LFA dairy farms by region, size groupings and profitability quartiles. It is possible to present the data for lowland farms through further analysis that examines the data by farm size groupings for each EU super region. The results of this analysis are presented in Tables A1 to A3 in the appendix, albeit that where the number of farms by any one group is less than 15, these data have been withheld to ensure that confidentiality of the data is not compromised. It was not possible to provide meaningful results for LFA on this basis of analysis due to sample size restrictions.

**Table 3.7: Outputs, Inputs and Margins: LFA by Profitability Quartiles**

LFA	Lower quartile		Upper quartile	
	07/08	08/09	07/08	08/09
Number of farms	17	18	17	18
Area (Ha)	186.96	181.09	82.10	78.15
	£/ha		£/ha	
<b>Output</b>				
Milk	538	831	1902	2483
Calf	23	44	91	108
Lease Quota (net)	0	0	1	0
Other Dairy	1	0	0	0
Herd Replacement	-43	-80	-169	-180
<b>Total Dairy Output</b>	<b>520</b>	<b>795</b>	<b>1824</b>	<b>2412</b>
Other Livestock	231	301	343	564
Other	274	189	357	314
<b>Total Farm Output</b>	<b>1025</b>	<b>1284</b>	<b>2524</b>	<b>3290</b>
<b>Variable Costs</b>				
Home-grown Concentrates	9	20	62	23
Purchased Concentrates	243	322	506	782
Coarse Fodder	17	31	29	53
Other Livestock Concentrates	16	18	0	0
Vet and Medicine	37	56	64	93
Other Livestock Costs	73	100	134	234
Seed	2	4	6	3
Fertiliser	30	50	98	108
Crop Protection	4	8	7	7
Other Crop Costs	5	8	8	11
<b>Total Variable Costs</b>	<b>436</b>	<b>617</b>	<b>915</b>	<b>1314</b>
<b>Fixed Costs</b>				
Labour	133	150	223	299
Contract	28	71	90	84
Machinery Depreciation	69	60	128	140
Other Machinery	113	75	100	161
Miscellaneous	105	118	202	256
Rent and Rental Equivalent	99	122	213	240
<b>Total Fixed Costs</b>	<b>547</b>	<b>595</b>	<b>956</b>	<b>1182</b>
<b>Net Farm Income</b>	<b>42</b>	<b>72</b>	<b>653</b>	<b>794</b>
Farmer / Spouse Labour	110	124	314	356
<b>Management &amp; Investment Income</b>	<b>-68</b>	<b>-51</b>	<b>339</b>	<b>438</b>
<b>Farm Business Income (FBI)</b>	<b>46</b>	<b>98</b>	<b>891</b>	<b>1035</b>

### 3.10: Dairy Enterprise Results: Gross Margin for All, Lowland, and LFA Farms

In the above sections, outputs, inputs and returns were presented for dairy farms on a per hectare basis, with results that included data from the dairy enterprise, plus other enterprises on the farm to produce overall farm results. In this and the following sections, results are presented that relate solely to the dairy enterprise and are reported to Gross Margin (GM) returns (total dairy output minus total variable costs). Table 3.8 provides the dairy enterprise results for all farms and for lowland and LFA farms as separate data. Examining the “all farms” results reveals that the average number of cows and average yield per cow remained virtually the same between 2007/08 and 2008/09. However, the value of milk output increased by £302 per cow due to an average milk price of 26.8 pence per litre (ppl), compared to 22.ppl achieved in 2007/08. The improved milk price resulted in increased values of herd replacements of £20/cow. Concentrate costs increased by £121/cow (+30%) and were the major contributor to the total variable cost increase of £154/cow. Further evidence of the positive effect derived from the improved milk price can be seen in the average GM, which for 2008/09 equalled 13.96ppl, compared to 11.97ppl in 2007/08. However, repeating the events of 2007/08, 35% of the increased milk value has been required to cover the increased in variable costs. Based on the average number of cows in 2008/09, the average GM for all farms is approximately £120,500, representing an increase on 2007/08 of 16% when the average GM was £104,000. Examining the differences between lowland and LFA dairy farms, reveals a familiar pattern, as highlighted in previous reports (Robertson and Wilson, 2007; 2008; 2009), of lowland herds achieving a higher yield, from a larger average herd size and selling milk at higher prices than their LFA counterparts. Both groups achieved higher milk prices in 2008/09, with increases on 2007/08 prices of 4.3ppl for lowland herds and 3.9ppl for LFA herds. On average, total variable costs in lowland production have increased by £147/cow whilst in LFA production the increase was £185/cow; respective increases in GM's are £158/cow and £81/cow. At the average herd sizes, in 2008/09, the total GM on lowland farms was approximately £130,500 and for LFA farms, just over £84,000.

**Table 3.8: Gross Margin Results for All Farms, Lowland and LFA**

	All Farms		All Lowland		All LFA	
	07/08	08/09	07/08	08/09	07/08	08/09
Number of farms	275	301	213	231	62	70
Average number cows	122.0	121.6	128.0	127.5	97.2	99.5
Average yield (litres)	7109	7125	7173	7190	6763	6815
	£/cow		£/cow		£/cow	
<b>Output</b>						
Milk	1605	1907	1629	1940	1476	1748
Calf	58	73	57	71	62	81
Lease Quota (net)	0	0	0	0	0	0
Other Dairy	0	0	0	0	2	0
Herd Replacement	-140	-160	-141	-161	-133	-156
<b>Total Dairy Output</b>	<b>1523</b>	<b>1820</b>	<b>1545</b>	<b>1851</b>	<b>1406</b>	<b>1673</b>
<b>Variable Costs</b>						
Concentrates	406	527	408	526	397	528
Coarse Fodder	25	25	26	23	24	37
Vet and Medicine	57	64	58	64	55	68
Other Livestock Costs	122	134	124	133	113	138
Forage Costs	62	76	64	79	53	58
<b>Total Variable Costs</b>	<b>672</b>	<b>826</b>	<b>678</b>	<b>825</b>	<b>643</b>	<b>828</b>
<b>Total Gross Margin</b>	<b>851</b>	<b>994</b>	<b>867</b>	<b>1025</b>	<b>764</b>	<b>845</b>

### 3.11: Dairy Enterprise Results: Influence of Herd Size on Lowland Herds

Gross margin results by three size categories for lowland farms are shown in Table 3.9. It is informative to note that for nearly all the key performance indicators, the same pattern is evident across all the three size groups. That is, that as herd size increases, so do average yield per cow, milk output per cow, total variable costs per cow and total gross margin per cow. Average yields per cow for the less than 80 cows group, the 80 to 130 cows group and the greater than 130 cows group are 6162 litres per cow (lpc); 7117 lpc and 7468 lpc respectively, with the greater than 130 cows group outperforming the less than 80 cows group by 1306 lpc (+21%). When the increased average milk prices are considered (less than 80 cows, 26.2ppl; 80 to 130 cows 26.8ppl; greater than 130 cows, 27.2ppl), the unsurprising uplift in milk outputs per cow for the respective groups are £1613/cow; £1905/cow and £2034/cow. Examining average total variable costs per cow shows that the less than 80 cows group, the 80 to 130 cows group and the greater than 130 cows group recorded £677/cow; £830/cow and £858/cow respectively, resulting in respective total gross margins of £891/cow; £998/cow and £1070/cow. However, the varied nature of input-output performances of the three groups alters the trend outlined above, with the less than 80 cows group and its 'low' input-output system achieving the highest GM per litre at 14.5ppl, followed by the greater than 130 cows group (14.3ppl) and the 80 to 130 cows group (14.0ppl).

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

<b>LOWLAND</b>	< 80 cows		80 – 130 cows		> 130 cows	
	07/08	08/09	07/08	08/09	07/08	08/09
Number of farms	54	60	76	81	83	90
Average number cows	56.1	56.5	103.1	105.2	218.4	210.9
Average yield (litres)	6063	6162	6909	7117	7557	7468
	£/cow		£/cow		£/cow	
<b>Output</b>						
Milk	1368	1613	1575	1905	1716	2034
Calf	63	86	65	75	53	66
Lease Quota (net)	-1	0	0	0	0	0
Other Dairy	0	0	0	0	0	0
Herd Replacement	-102	-131	-140	-152	-151	-173
<b>Total Dairy Output</b>	<b>1328</b>	<b>1568</b>	<b>1499</b>	<b>1828</b>	<b>1618</b>	<b>1928</b>
<b>Variable Costs</b>						
Concentrates	333	406	399	525	429	556
Coarse Fodder	15	12	25	21	28	26
Vet and Medicine	48	51	54	63	62	67
Other Livestock Costs	117	135	127	138	124	129
Forage Costs	58	73	61	82	66	80
<b>Total Variable Costs</b>	<b>571</b>	<b>677</b>	<b>665</b>	<b>830</b>	<b>709</b>	<b>858</b>
<b>Total Gross Margin</b>	<b>757</b>	<b>891</b>	<b>834</b>	<b>998</b>	<b>909</b>	<b>1070</b>

### 3.12: Dairy Enterprise Results: Influence of Region on Lowland Herds

The average results by EU super region for lowland herds are presented in Table 3.10. The pattern of average milk yields in 2008/09 differs from the previous year, with the East region remaining as the top performer but the North and West regions changing places, resulting in the West region having the lowest average yield. Despite the West region's comparatively low average yield, its position as the region that recorded the highest average milk price (27.4ppl) resulted in it achieving a milk output of £1943/cow; only £27/cow lower than in the East region and £35/cow higher than in the North. Total variable costs increased across all three regions; largely driven by increases in concentrate costs. Gross margins for North, East and West in 2008/09 were £928/cow, £1062/cow and £1068/cow, equating to increases over the previous year of £147/cow, £131/cow and £187/cow respectively.

**Table 3.10: Gross Margin Results: Lowland by EU Super Region**

LOWLAND	North		East		West	
	07/08	08/09	07/08	08/09	07/08	08/09
Number of farms	55	61	54	54	104	116
Average number cows	119.0	134.3	130.5	132.8	132.0	121.2
Average yield (litres)	7011	7236	7490	7348	7101	7083
	£/cow		£/cow		£/cow	
<b>Output</b>						
Milk	1551	1912	1709	1970	1631	1943
Calf	54	69	56	67	60	75
Lease Quota (net)	0	0	0	0	0	0
Other Dairy	0	0	0	0	0	0
Herd Replacement	-150	-189	-95	-123	-160	-163
<b>Total Dairy Output</b>	<b>1455</b>	<b>1793</b>	<b>1671</b>	<b>1913</b>	<b>1530</b>	<b>1855</b>
<b>Variable Costs</b>						
Concentrates	409	561	434	530	394	503
Coarse Fodder	31	31	35	28	18	15
Vet and Medicine	63	70	60	66	54	59
Other Livestock Costs	111	128	147	151	119	126
Forage Costs	61	74	64	77	65	84
<b>Total Variable Costs</b>	<b>674</b>	<b>864</b>	<b>740</b>	<b>851</b>	<b>649</b>	<b>788</b>
<b>Total Gross Margin</b>	<b>781</b>	<b>928</b>	<b>931</b>	<b>1062</b>	<b>881</b>	<b>1068</b>

### 3.13: Dairy Enterprise Results: Lowland Herds by Performance Groups

Results measured by gross margin performance for lowland farms are presented in Table 3.11. The results are shown for the upper and lower quartiles as measured by gross margin performance. A comparison of the two quartile groups reveals striking differences with respect to two key physical performance indicators; namely the differences between average herd size and average yields. The average herd size of the upper quartile is 145 cows compared to the lower quartile's average herd size of 101 cows. It is interesting to note that for the second year in succession the average herd size of the lower quartile has increased quite substantially, which may be a reflection of the hastening exodus from the industry of the smallest sized herds. Average milk yield for the upper quartile is 8137 lpc., whilst for the lower quartile it is 5623lpc; a difference of 2514 lpc between the two groups. The difference in milk price between the two quartiles in 2007/08 was 2.7ppl; this difference narrowed to 1.7ppl in 2008/09 (upper quartile 27.7ppl; lower quartile 26.0ppl). The improved milk prices experienced in 2008/09 brought with them increases in the value of dairy breeding stock and both quartiles recorded higher herd replacement costs per cow, although the familiar pattern emerged whereby the upper quartile incurred lower replacement costs than the lower quartile. Concentrate costs increased by 34.2% for farms in the lower quartile and by 26.5% for upper quartile farms, leading to substantial increases in total variable costs for both groups. It is noteworthy to record that the difference in the rates of conversion of concentrates to milk between the two quartile groups, widened in 2008/09 (2008/09, upper quartile, 6.6ppl; lower quartile, 8.6ppl; cf 2007/08, 5.4ppl and 6.4ppl respectively). Gross margin results presented per litre equal 10.64ppl for the lower quartile and 16.84ppl for the upper quartile. This analysis of upper and lower quartile groups reveals a continuation of previous year's findings which show that the larger herds with their high-input, high-output systems, achieve the higher GM, with the main factor being the higher milk price attained from a superior quality product and / or better utilisation of the market.

**Table 3.11: Gross Margin Results: Lowland by Performance Quartiles**

<b>LOWLAND</b>	Lower quartile		Upper quartile	
	07/08	08/09	07/08	08/09
Number of farms	53	58	53	58
Average number cows	90.7	101.2	156.2	144.9
Average yield (litres)	5637	5623	7889	8137
	£/cow		£/cow	
<b>Output</b>				
Milk	1227	1461	1934	2255
Calf	48	58	59	80
Lease Quota (net)	-1	0	0	0
Other Dairy	0	0	0	0
Herd Replacement	-150	-183	-109	-143
<b>Total Dairy Output</b>	<b>1123</b>	<b>1336</b>	<b>1884</b>	<b>2191</b>
<b>Variable Costs</b>				
Concentrates	359	482	423	535
Coarse Fodder	17	18	27	23
Vet and Medicine	45	49	58	64
Other Livestock Costs	111	121	129	125
Forage Costs	56	67	61	75
<b>Total Variable Costs</b>	<b>588</b>	<b>738</b>	<b>698</b>	<b>822</b>
<b>Total Gross Margin</b>	<b>535</b>	<b>598</b>	<b>1186</b>	<b>1370</b>

### 3.14: Dairy Enterprise Results: Influence of Herd Size on LFA Herds

Table 3.12 shows the results of the gross margin analysis of LFA farms by herd size. In order to maintain confidentiality, the data for the herd size group of greater than 130 cows has been withheld due to sample size restrictions. Examining the herd structures of the less than 80 cows group and the 80 to 130 cows group reveals that between the two years presented, little has changed in terms of average herd size. The average yield for the 80 to 130 cows group has increased by just over 100 lpc, whilst for the less than 80 cows group average yield has decreased by approximately 250lpc. Both herd sizes presented achieved higher milk prices than in the previous year, equating in both cases to an approximate 4.00ppl increase in the price of milk sold. However, at these price levels, LFA dairy farms underachieve when compared to their lowland counterparts with both size groups recording milk prices approximately 1.00ppl lower than lowland dairy herds. Concentrate costs have increased from 2007/08 to 2008/09 and represent a cost of 7.4ppl and 8.4ppl for the less than 80 cows and the 80 to 130 cows groups respectively. The increase in GM between the two years presented is broadly similar, but remains lower than the GM for the comparable herd size groupings for lowland production as noted in Table 3.9.

**Table 3.12: Gross Margin Results: LFA by Herd Size**

LFA	< 80 cows		80 – 130 cows		> 130 cows	
	07/08	08/09	07/08	08/09	07/08	08/09
Number of farms	29	35	21	23	<i>Ins. data</i>	<i>Ins. data</i>
Average number cows	57.8	56.5	98.3	101.9		
Average yield (litres)	6196	5927	6965	7068		
	£/cow		£/cow		£/cow	
<b>Output</b>						
Milk	1308	1493	1534	1836		
Calf	69	96	65	84		
Lease Quota (net)	0	0	0	0		
Other Dairy	5	0	0	0		
Herd Replacement	-120	-143	-131	-168		
<b>Total Dairy Output</b>	<b>1262</b>	<b>1446</b>	<b>1468</b>	<b>1752</b>		
<b>Variable Costs</b>						
Concentrates	350	439	456	591		
Coarse Fodder	21	18	25	44		
Vet and Medicine	45	55	61	75		
Other Livestock Costs	109	132	107	154		
Forage Costs	40	53	54	65		
<b>Total Variable Costs</b>	<b>566</b>	<b>697</b>	<b>702</b>	<b>929</b>		
<b>Total Gross Margin</b>	<b>697</b>	<b>749</b>	<b>767</b>	<b>823</b>		

### 3.15: Dairy Enterprise Results: Influence of Region on LFA Herds

Analysis of gross margin data for LFA farms by EU super region is presented in Table 3.13. Sample size restrictions mean that data for the East LFA region has been withheld. However, comparison between the North and West regions is possible. The North region has witnessed an increase in both average herd size and average yield, while the reverse has occurred in the West. There is a notable difference in average yield between the two regions with the North recording 629 litres per cow (+10.2%) more than the West. Milk output has increased by £273/cow and £256/cow for the North and West respectively, and with increases in concentrate costs of £154/cow and £79/cow respectively, GMs have increased in both regions. Despite the North region's superior milk yield and output, its higher variable costs compared to the West has resulted in the North achieving a lower GM than the West (North, £769/cow; West, £878/cow).

**Table 3.13: Gross Margin Results: LFA by EU Super Region**

LFA	North		East		West	
	07/08	08/09	07/08	08/09	07/08	08/09
Number of farms	37	42	<i>Ins. data</i>	<i>Ins. data</i>	15	18
Average number cows	89.6	94.8			96.0	93.6
Average yield (litres)	6726	6773			6293	6144
	£/cow		£/cow		£/cow	
<b>Output</b>						
Milk	1472	1745			1337	1593
Calf	62	80			70	82
Lease Quota (net)	0	0			0	0
Other Dairy	0	0			0	0
Herd Replacement	-134	-164			-145	-163
<b>Total Dairy Output</b>	<b>1399</b>	<b>1661</b>			<b>1263</b>	<b>1513</b>
<b>Variable Costs</b>						
Concentrates	408	562			336	415
Coarse Fodder	22	37			25	27
Vet and Medicine	60	76			37	46
Other Livestock Costs	115	148			94	98
Forage Costs	53	70			49	50
<b>Total Variable Costs</b>	<b>658</b>	<b>892</b>			<b>540</b>	<b>635</b>
<b>Total Gross Margin</b>	<b>741</b>	<b>769</b>			<b>722</b>	<b>878</b>

### 3.16: Dairy Enterprise Results: LFA Herds by Performance Groups

The analysis by performance quartiles for lowland herds, measured by gross margins and outlined in Section 3.13, highlighted larger herd size, higher average yield and higher milk price as the main performance drivers. Examining Table 3.14, reveals that for LFA herds, the pattern noted for lowland herds is repeated for LFA herds. The average herd size and average milk yield for the upper quartile are 65 cows and 2354 litres per cow greater than for the lower quartile. The average milk price for the upper quartile exceeds that for the lower quartile by 1.3ppl, which when combined with the upper quartile's higher average yield, produces milk outputs of £2051/cow and £1370/cow for the upper and lower quartiles respectively. As noted in previous reports (Robertson and Wilson, 2007; 2008; 2009) herd replacement costs are lower for the upper quartile group. The upper quartile incurred total variable costs that are £146/cow greater than the lower quartile; a difference that is largely driven by higher concentrate costs for the upper quartile. The upper quartile's high-output, high-input system produced a GM of £1098/cow, compared to the lower quartile's characteristic low-output, low-input system which produced a GM of £475/cow.

**Table 3.14: Gross Margin Results: LFA by Performance Groups**

LFA	Lower quartile		Upper quartile	
	07/08	08/09	07/08	08/09
Number of farms	15	18	15	18
Average number cows	84.1	88.9	144.2	154.4
Average yield (litres)	5158	5516	7963	7870
	£/cow		£/cow	
<b>Output</b>				
Milk	1048	1370	1840	2051
Calf	57	87	60	75
Lease Quota (net)	0	0	0	0
Other Dairy	0	0	0	0
Herd Replacement	-138	-216	-127	-115
<b>Total Dairy Output</b>	<b>968</b>	<b>1241</b>	<b>1777</b>	<b>2011</b>
<b>Variable Costs</b>				
Concentrates	359	470	475	591
Coarse Fodder	34	41	31	42
Vet and Medicine	44	60	71	77
Other Livestock Costs	86	134	134	153
Forage Costs	42	60	60	49
<b>Total Variable Costs</b>	<b>566</b>	<b>766</b>	<b>770</b>	<b>912</b>
<b>Total Gross Margin</b>	<b>402</b>	<b>475</b>	<b>1007</b>	<b>1098</b>

### 3.17: Further Analysis: Dairy Enterprise Results for Lowland by Region and Herd Size

Further analyses of the enterprise GM results (for lowland production) are presented in the appendix in Tables A4 to A6. Where the number of data observations permit (15 or above), the results are provided by EU super region by herd size. Unfortunately it was not possible to provide meaningful results for LFA production by region and herd size.

## Chapter 4: Discussion and Conclusion

### 4.1: Introduction

Chapter 3 has provided enterprise and gross margin results for dairy farming in England, detailing returns for both 2007/08 and 2008/09. In doing so, the previous chapter has focused upon particular results by region, farm size or herd size and performance quartile. Chapter 4 draws together the main findings identified in the above chapter and sets these in the context of previous research.

### 4.2: Lowland Dairying

In 2008/09, lowland dairying in England achieved an average Farm Business Income (FBI) of £630/ha, compared with £499/ha in 2007/08. Management and Investment Income (MII) also improved between the two years with returns to MII in 2008/09 of £318/cow in comparison to an MII of £213/cow in the previous year. As noted in the previous report, the number of farms in the less than 60 cows group has declined in recent years, whilst the number of farms in the greater than 120 cows group has increased. An examination of the results by farm size reveals a continuation of this trend, adding to the suggestion that structural change within the industry is on-going, with the remaining dairy farms tending to have increasingly larger herds (Robertson and Wilson, 2009). The less than 60 hectares group is characterised by its comparatively high degree of specialisation which does not, however, translate into higher levels of income, in terms of MII, when compared to the other larger size groups. A greater reliance on farmer and spouse labour on the smaller farms results in an MII that is negative for the less than 60 hectares group, with the larger size groups producing relatively healthy and positive MII returns. However, FBI returns show that the smaller farms achieved levels of income that were significantly higher than the greater than 120 hectares group and similar to the 60 to 120 hectares group. Regional analysis of lowland production showed that, on average, the North and West regions have dairying systems that are more specialised than those found in the East. Data shows that farms in the East recorded the lowest level of milk output and the lowest expenditure on variable costs. Despite the North having achieved the highest milk output, the West, as a consequence of its lower variable costs, achieved the highest FBI. Of note is the comparatively high other livestock costs in the North, which may be due to the high cost of straw (including transport) in 2008, which is in relatively short supply in the northern region. Analysis by profitability quartiles shows the wide variation in average performance of all the key performance indicators, between the upper and lower quartiles. Milk output for farms in the upper quartile is almost double that of farms in the lower quartile. However, total variable costs for the upper quartile are £590/ha greater than those of the lower quartile. The upper quartile's high output-input systems produced an average FBI return that was more than £1150/ha greater than FBI on the lower quartile farms. Although there is some variation between the two quartile's respective levels of variable and fixed costs, the key to the large difference in FBI is clearly the levels of milk output achieved.

Gross margin results for the "all farms" group (lowland and LFA) show a significant increase in average GM at £994/cow in 2008/09, compared to £851/cow in the previous year. Although yields were static between the two years, the improved milk price (2008/09) of 26.8pppl (*cf* 22.6pppl in 2007/08) produced this notable increase in GM returns. However, 35% of the increased milk value was required to cover the increase in total variable costs. This pattern is true for lowland herds, where yields were stable and the average milk price increased by 4.3pppl. Increased variable costs eroded a sizable proportion of the increased milk value; however, the GM for lowland herds increased by £158/cow. The results by lowland herd size shows increases in GM/cow across all three size groups. The greater than 130 cows group witnessed a decline in average yield, while the two smaller size groups achieved notable increases in yields. Nonetheless, there is a strong correlation between average herd size and average milk yield across the three size groups. Regional analysis reveals that once again the East achieved the highest average yield, with the West achieving the lowest yield; a position held by the North in 2007/08. However, regional differences in average milk price saw the West achieve a milk output that was almost on a par with the East

and slightly higher than the North. Significant increases in concentrate costs contributed to notable increases in total variable costs across the three regions. GM returns in the North, East and West, increased by £147/cow, £131/cow and £187/cow, respectively. Examining GM performance by performance quartiles reveals the strong correlation between herd size and milk yield. The upper quartile group averages 145 cows per herd, producing an average yield of 8137lpc, while the lower quartile averages 101 cows per herd and 5623lpc. Average milk price achieved for upper quartile herds was 27.7ppl, compared to 26.0ppl for the lower quartile. Both quartile groups experienced large increases in concentrate costs. As a result, the conversion rate of concentrates to milk deteriorated between 2007/08 and 2008/09. The high input-output systems that characterise the upper quartile produced a Total Gross Margin (TGM) that was £772/cow greater than that of the lower quartile.

### 4.3: Less Favoured Area Dairying

The above analysis of lowland dairy farming indicated that MII improved by £105/ha from 2007/08 to 2008/09. Although LFA dairy farms also achieved improvement in their MII returns, their less intensive production systems produced a smaller increase of £65/ha. It is noteworthy to consider the differences between the two groups in MII and FBI returns considering the similar average size structure of lowland and LFA farms. Analysis by farm size shows that the largest group (greater than 120 hectares) farms at a lower intensity than the other two smaller size groups, recording a total farm output of £1741/ha, compared to £2640/ha and £2730/ha for the less than 60 hectares group and 60 to 120 hectares group, respectively. All three size groups recorded significant increases in total variable and total fixed costs that were largely driven by escalating feed, labour and energy costs. The resultant MII returns for LFA farms repeat the pattern shown for lowland farms with the largest farm size group achieving the highest average MII, despite this group's relatively low input-output systems and the smallest size group recording the lowest MII. The influence of family labour on the smaller farms is highlighted by the FBI returns which show that when taking farmer and spouse labour into account, the situation noted for MII is reversed with the less than 60 hectares group achieving the highest FBI and the greater than 120 hectares group achieving the lowest FBI. The influence of region on LFA dairy farming can be summarised by stating that the West region, with its high input-output systems when compared to the North, achieved the highest MII (£179/ha, cf. North £92/ha) and the highest FBI (£625/ha, cf. North £347/ha.) Analysis of performance by profitability quartiles shows a repeat of the pattern for lowland farms whereby the upper quartile consists of the smallest farms. However, the upper quartile achieved a markedly higher total farm output than the lower quartile, through a combination of better milk prices and higher yields. Significant increases in costs eroded the gains in output that were achieved by both quartile groups. MII returns improved for both groups; however the lower quartile group remained in negative territory, recording an average MII of minus £51/ha compared to £438/ha for the upper quartile. At the average farm sizes for these groups, the lower and upper quartiles achieved FBI returns of £17,700 and £81,000 respectively.

An analysis of GM results for LFA farms shows that in 2008/09, milk yields increased slightly (+0.8%) from 2007/08 and milk prices improved by an average of 3.8ppl. As a consequence of these improved performance indicators, milk output increased by £272/ha. However, just as for lowland farms, a significant proportion of the increased output was eroded by a sizeable increase in total variable costs. The total gross margin per cow for LFA farms in 2008/09 was £845/cow (£764/cow; 2007/08) which at the average herd size translates to approximately £84,000 (£74,000; 2007/08). The results by LFA herd size are restricted to the two smaller size groups, which reveal that both the less than 80 cows group and the 80 to 130 cows group achieved increases in their milk prices of approximately 4.00ppl. However, milk prices on LFA farms were approximately 1.00ppl lower than those achieved on lowland farms. The less than 80 cows group incurred concentrate costs of 7.4ppl of milk produced, compared to 8.4ppl for the 80 to 130 cows group. Both size groups achieved increases in total gross margin of approximately £55/cow. Examining the regional analysis of LFA farms

reveals that the North experienced increases in both average herd size and average yield, whilst in the West the opposite was true. Average yield is approximately +10% higher in the North than in the West. Both regions achieved notable increases in milk output (£273/cow, North; £256/cow, West). The North witnessed increases in concentrate costs of £154/cow, compared to £79/cow in the West. The North region's comparatively high input-output system resulted in a lower GM than achieved in the West (North, £769/cow; West, £878/cow). Examining GM performance by performance quartiles reveals that the upper quartile contains the largest herd sizes that in turn, produce the highest yields. The upper quartile also achieved the highest milk price. Compared to the lower quartile, the upper quartile incurred lower replacement costs and higher total variable costs. Total gross margins for the lower and upper quartiles in 2008/09 were £475/cow and £1098/cow, respectively. This pattern, whereby the most successful producers at GM level operate high input-output systems has been in evidence across both LFA and lowland production systems and has been reported in all the previous editions of this report. Technical efficiencies, coupled with better quality milk, sold to more favourable contracts are the clear markers for distinguishing between farms in the upper and lower quartiles.

#### **4.4: Comparison with Previous Research**

The validity of this report is enhanced by the fact that the sample of dairy farms upon which it is based, is drawn from the very stable sample of Farm Business Survey (FBS) farms and thus ensures that the report's findings are based on real changes in the industry and are not borne of changes within the sample. This report, the fourth in the *Dairy Farming in England* series, consists of two central themes; 1) the improved financial performance of dairy farming in 2008/09; a continuation of the better economic conditions of 2007/08 (Robertson and Wilson, 2009) and 2) the continuation of the wide disparity in performance within the dairy sector. With milk yields remaining fairly static, the improved economic returns highlighted in *Dairy Farming in England 2008/09* are almost entirely due to the increase in the average price of milk, which resulted in a 19% improvement in the value of milk output per cow. However, dairy farmers have been unable to retain all the output gains due to the significant rise in variable costs; in particular, concentrate costs which increased by 30% per cow. This has meant that 40% of the output gains from milk have been eroded by higher feed costs. This is a similar situation to that reported in 2007/08 when milk output increased by 23% per cow, only to be eroded by an increase of 25% per cow for concentrate costs. In terms of average Farm Business Income (FBI), the average dairy farm achieved £70,500, compared to £55,000 in the previous year. On the basis of Management and Investment (MII), 2008/09 witnessed a notable increase in the returns available to cover managerial input and provide a return on tenant's capital. For the years 2005/06, 2006/07, 2007/08 and 2008/09, the respective MII returns were £46/ha, -£2/ha, £186/ha and £281/ha. Last year's report recorded a return on tenant's capital of approximately 5%. The improved MII achieved in 2008/09 has boosted the return on capital to approximately 8%, but this has to be put into the context of many dairy farmers being faced with large investments in order to comply with environmental regulations and so be in a position to remain in the industry. This is central to the current dilemma facing dairy farmers over whether to remain in dairying. Insufficient profits and returns on capital necessitate borrowing if investments are to be made in order to farm in a way that does not infringe newly introduced environmental regulations and standards. However, as noted above and in previous reports, there exists a wide variation in technical and economic performance within the dairying sector and it is likely that those remaining in dairying will be the better performers who, by definition, are more able to re-invest without resorting to high borrowings. Previous reports in this series have noted the distinct characteristics of farms in the lower and upper performance quartiles. This report further confirms these past observations whereby the best performers by gross margin analysis achieve higher yields and higher milk prices, whilst incurring higher variable costs per cow. At the farm level, farms in the upper quartile also practice high input-output systems, achieving higher outputs and incomes per hectare, which are derived from greater variable and fixed costs. The evidence within this report is that the increases in farm and herd size, reported in previous reports, have abated. So, although the structure of the dairy industry at the macro-level continues to change; e.g. fewer dairy producers and fewer cows, at the micro-level the structure at the farm-level appears to be steady.

#### **4.5: Conclusion**

This report has described the recent changes in the structure of the dairying industry and the market conditions dairy farmers experienced during 2008/09 (Chapter 1) and has also analysed and reported at both the farm-level and gross margin level, the economic performance of dairy farming (Chapter 3). It could be assessed that these two segments of the report are conflicting. Chapter 1 describes an industry that is contracting, as producers leave the industry (down 3.5%) and the national herd size continues to decrease (down 57,000 cows). In 2008/09, UK national milk production was at its lowest level since the early 1970s and there has been no significant increase in average milk yield since 2005/06. However, Chapter 3 describes a year in which incomes from dairy farming reached levels (high) not witnessed in recent times. Increases in milk prices resulted in significant increases in farm output, although this has to be set against large rises in the costs of feed, fertiliser and energy. Whether this upturn in economic fortunes is sufficient to halt the decline in the production base of the dairy industry remains to be seen. If simple profit and loss economics was the only concern, then if the higher income levels of 2008/09 were to be repeated for one or two more years, then this might be the case. However, even achieving greater incomes might not be enough to deter some farmers from exiting the industry when they are faced with large investments in order to comply with environmental regulations and perhaps not enough years left in farming to recoup the investment. As has been noted elsewhere in this report, there is a huge variation in the performance levels of dairy farmers and it is likely that, even if dairying sustains a period of higher incomes, it will be only the better producers that remain in the industry. Therefore, it is likely that structural change, currently at a steady state, will gather pace once again with a larger proportion of the output being produced by a smaller number of producers.

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## 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, 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 woodshavings 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: Results by Region and Farm Size

Table A.1: Outputs, Inputs and Margins: Lowland (North) by Farm Size

LOWLAND (North)	< 60 ha		60 – 120 ha		> 120 ha	
	07/08	08/09	07/08	08/09	07/08	08/09
Number of farms	17	Insufficient data	23	25	19	23
Area (Ha)	47.03		86.58	85.78	169.07	174.27
	£/ha		£/ha		£/ha	
<b>Output</b>						
Milk	1808		1930	2786	1802	2247
Calf	81		78	107	53	73
Lease Quota (net)	0		-1	0	0	0
Other Dairy	0		0	0	0	0
Herd Replacement	-161		-210	-277	-172	-220
<b>Total Dairy Output</b>	<b>1728</b>		<b>1798</b>	<b>2616</b>	<b>1683</b>	<b>2100</b>
Other Livestock	387		294	530	320	458
Other	617		441	467	470	432
<b>Total Farm Output</b>	<b>2732</b>		<b>2533</b>	<b>3613</b>	<b>2473</b>	<b>2991</b>
<b>Variable Costs</b>						
Home-grown Concentrates	46		44	58	79	50
Purchased Concentrates	537		552	890	493	715
Coarse Fodder	41		26	71	71	49
Other Livestock Concentrates	8		1	0	0	0
Vet and Medicine	81		79	111	90	101
Other Livestock Costs	200		174	255	173	210
Seed	10		17	21	21	27
Fertiliser	94		88	132	83	129
Crop Protection	9		15	19	21	26
Other Crop Costs	25		13	16	22	20
<b>Total Variable Costs</b>	<b>1052</b>		<b>1008</b>	<b>1573</b>	<b>1053</b>	<b>1327</b>
<b>Fixed Costs</b>						
Labour	255		252	301	248	271
Contract	131		86	136	99	131
Machinery Depreciation	215		131	163	135	126
Other Machinery	150		121	175	125	151
Miscellaneous	284		228	286	194	210
Rent and Rental Equivalent	219		254	284	210	234
<b>Total Fixed Costs</b>	<b>1253</b>		<b>1072</b>	<b>1344</b>	<b>1011</b>	<b>1123</b>
<b>Net Farm Income</b>	<b>427</b>		<b>453</b>	<b>697</b>	<b>409</b>	<b>541</b>
Farmer / Spouse Labour	454		251	285	115	128
<b>Management &amp; Investment Income</b>	<b>-27</b>		<b>201</b>	<b>412</b>	<b>295</b>	<b>413</b>
<b>Farm Business Income (FBI)</b>	<b>497</b>		<b>564</b>	<b>831</b>	<b>435</b>	<b>581</b>

Table A.2: Outputs, Inputs and Margins: Lowland (East) by Farm Size

LOWLAND (East)	< 60 ha		60 – 120 ha		> 120 ha	
	07/08	08/09	07/08	08/09	07/08	08/09
Number of farms	<i>Ins data</i>	<i>Ins data</i>	17	22	32	32
Area (Ha)			82.83	86.96	219.77	222.95
	£/ha		£/ha		£/ha	
<b>Output</b>						
Milk			1997	2244	1346	1697
Calf			76	81	40	46
Lease Quota (net)			0	0	0	0
Other Dairy			0	1	0	0
Herd Replacement			-109	-114	-76	-126
<b>Total Dairy Output</b>			<b>1964</b>	<b>2211</b>	<b>1310</b>	<b>1618</b>
Other Livestock			282	376	249	347
Other			582	449	551	529
<b>Total Farm Output</b>			<b>2828</b>	<b>3036</b>	<b>2109</b>	<b>2493</b>
<b>Variable Costs</b>						
Home-grown Concentrates			27	24	58	43
Purchased Concentrates			573	737	362	457
Coarse Fodder			63	27	35	39
Other Livestock Concentrates			2	0	4	5
Vet and Medicine			71	84	56	65
Other Livestock Costs			211	221	137	145
Seed			22	29	23	35
Fertiliser			60	88	60	78
Crop Protection			15	18	30	37
Other Crop Costs			36	32	12	19
<b>Total Variable Costs</b>			<b>1083</b>	<b>1260</b>	<b>779</b>	<b>923</b>
<b>Fixed Costs</b>						
Labour			330	318	277	288
Contract			141	177	109	127
Machinery Depreciation			122	138	108	131
Other Machinery			152	165	133	165
Miscellaneous			283	306	189	219
Rent and Rental Equivalent			219	214	205	214
<b>Total Fixed Costs</b>			<b>1247</b>	<b>1317</b>	<b>1022</b>	<b>1144</b>
<b>Net Farm Income</b>			<b>498</b>	<b>459</b>	<b>308</b>	<b>426</b>
Farmer / Spouse Labour			347	301	109	112
<b>Management &amp; Investment Income</b>			<b>151</b>	<b>158</b>	<b>199</b>	<b>315</b>
<b>Farm Business Income (FBI)</b>			<b>579</b>	<b>533</b>	<b>359</b>	<b>469</b>

**Table A.3: Outputs, Inputs and Margins: Lowland (West) by Farm Size**

<b>LOWLAND (East)</b>	< 60 ha		60 – 120 ha		> 120 ha	
	07/08	08/09	07/08	08/09	07/08	08/09
Number of farms	18	21	51	58	46	49
Area (Ha)	39.87	40.24	86.38	89.46	191.38	185.15
	£/ha		£/ha		£/ha	
<b>Output</b>						
Milk	2291	2638	1885	2239	1924	2129
Calf	99	126	85	94	60	73
Lease Quota (net)	0	0	0	0	-1	0
Other Dairy	0	1	0	0	0	0
Herd Replacement	-235	-225	-200	-180	-186	-190
<b>Total Dairy Output</b>	<b>2155</b>	<b>2538</b>	<b>1770</b>	<b>2153</b>	<b>1797</b>	<b>2013</b>
Other Livestock	480	566	474	550	389	453
Other	284	296	372	353	499	504
<b>Total Farm Output</b>	<b>2919</b>	<b>3400</b>	<b>2616</b>	<b>3056</b>	<b>2685</b>	<b>2970</b>
<b>Variable Costs</b>						
Home-grown Concentrates	28	38	33	39	85	66
Purchased Concentrates	620	781	481	631	501	610
Coarse Fodder	20	20	37	35	23	20
Other Livestock Concentrates	28	18	31	59	26	9
Vet and Medicine	88	105	69	79	75	78
Other Livestock Costs	234	261	170	186	177	176
Seed	14	19	23	27	28	35
Fertiliser	94	151	75	96	78	119
Crop Protection	10	10	14	16	32	34
Other Crop Costs	21	19	14	16	16	19
<b>Total Variable Costs</b>	<b>1156</b>	<b>1424</b>	<b>949</b>	<b>1183</b>	<b>1042</b>	<b>1166</b>
<b>Fixed Costs</b>						
Labour	95	181	269	304	328	334
Contract	105	105	143	147	127	131
Machinery Depreciation	165	170	132	145	138	151
Other Machinery	172	211	126	147	148	180
Miscellaneous	269	309	226	240	196	221
Rent and Rental Equivalent	277	278	260	265	259	256
<b>Total Fixed Costs</b>	<b>1082</b>	<b>1253</b>	<b>1157</b>	<b>1248</b>	<b>1196</b>	<b>1274</b>
<b>Net Farm Income</b>	<b>681</b>	<b>723</b>	<b>510</b>	<b>626</b>	<b>447</b>	<b>530</b>
Farmer / Spouse Labour	759	767	310	310	136	142
<b>Management &amp; Investment Income</b>	<b>-78</b>	<b>-45</b>	<b>201</b>	<b>316</b>	<b>311</b>	<b>388</b>
<b>Farm Business Income (FBI)</b>	<b>759</b>	<b>816</b>	<b>587</b>	<b>765</b>	<b>528</b>	<b>653</b>

**Table A.4: Gross Margin Results: Lowland (North) by Herd Size**

<b>LOWLAND (North)</b>	< 80 cows		80 – 130 cows		> 130 cows	
	<i>07/08</i>	<i>08/09</i>	<i>07/08</i>	<i>08/09</i>	<i>07/08</i>	<i>08/09</i>
Number of farms	18	16	20	20	17	25
Average number cows	55.9	56.4	103.1	107.8	220.3	216.8
Average yield (litres)	5615	5771	6887	7178	7544	7560
	£/cow		£/cow		£/cow	
<b>Output</b>						
Milk	1221	1473	1510	1864	1684	2022
Calf	60	80	57	73	50	65
Lease Quota (net)	0	0	-1	0	0	0
Other Dairy	0	0	0	0	0	0
Herd Replacement	-92	-141	-147	-200	-170	-195
<b>Total Dairy Output</b>	<b>1189</b>	<b>1412</b>	<b>1419</b>	<b>1737</b>	<b>1563</b>	<b>1893</b>
<b>Variable Costs</b>						
Concentrates	286	400	421	555	443	596
Coarse Fodder	9	13	21	22	44	38
Vet and Medicine	44	46	55	66	73	76
Other Livestock Costs	94	112	112	140	116	127
Forage Costs	55	66	66	79	60	74
<b>Total Variable Costs</b>	<b>486</b>	<b>637</b>	<b>674</b>	<b>862</b>	<b>737</b>	<b>912</b>
<b>Total Gross Margin</b>	<b>703</b>	<b>775</b>	<b>745</b>	<b>875</b>	<b>826</b>	<b>980</b>

**Table A.5: Gross Margin Results: Lowland (East) by Herd Size**

<b>LOWLAND (East)</b>	< 80 cows		80 – 130 cows		> 130 cows	
	<i>07/08</i>	<i>08/09</i>	<i>07/08</i>	<i>08/09</i>	<i>07/08</i>	<i>08/09</i>
Number of farms	<i>Ins data</i>	<i>Ins data</i>	25	28	20	19
Average number cows			106.6	105.5	208.9	211.3
Average yield (litres)			7004	6998	8066	7684
	£/cow		£/cow		£/cow	
<b>Output</b>						
Milk			1596	1865	1816	2072
Calf			66	67	51	64
Lease Quota (net)			0	1	0	0
Other Dairy			0	0	0	0
Herd Replacement			-106	-117	-106	-126
<b>Total Dairy Output</b>			<b>1556</b>	<b>1815</b>	<b>1761</b>	<b>2011</b>
<b>Variable Costs</b>						
Concentrates			403	517	452	551
Coarse Fodder			40	26	32	30
Vet and Medicine			49	65	65	67
Other Livestock Costs			153	154	140	146
Forage Costs			50	73	73	77
<b>Total Variable Costs</b>			<b>694</b>	<b>834</b>	<b>761</b>	<b>871</b>
<b>Total Gross Margin</b>			<b>862</b>	<b>981</b>	<b>1000</b>	<b>1139</b>

**Table A.6: Gross Margin Results: Lowland (West) by Herd Size**

<b>LOWLAND (Westt)</b>	< 80 cows		80 – 130 cows		> 130 cows	
	<i>07/08</i>	<i>08/09</i>	<i>07/08</i>	<i>08/09</i>	<i>07/08</i>	<i>08/09</i>
Number of farms	27	37	31	33	46	46
Average number cows	55.2	54.9	100.3	103.1	221.7	207.0
Average yield (litres)	6311	6151	6842	7186	7356	7319
	£/cow		£/cow		£/cow	
<b>Output</b>						
Milk	1400	1623	1605	1971	1689	2026
Calf	69	89	70	84	55	68
Lease Quota (net)	0	0	0	0	0	0
Other Dairy	0	0	0	0	0	0
Herd Replacement	-146	-125	-166	-152	-161	-178
<b>Total Dairy Output</b>	<b>1322</b>	<b>1588</b>	<b>1508</b>	<b>1903</b>	<b>1583</b>	<b>1916</b>
<b>Variable Costs</b>						
Concentrates	324	396	378	511	414	532
Coarse Fodder	12	9	15	16	20	17
Vet and Medicine	41	50	58	60	56	61
Other Livestock Costs	117	140	116	122	120	124
Forage Costs	57	69	66	93	66	85
<b>Total Variable Costs</b>	<b>551</b>	<b>665</b>	<b>633</b>	<b>802</b>	<b>676</b>	<b>818</b>
<b>Total Gross Margin</b>	<b>771</b>	<b>922</b>	<b>875</b>	<b>1101</b>	<b>906</b>	<b>1098</b>

## **Appendix 2: 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**

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