

Supply Responsiveness in Dairy Farming: Some Regional Considerations*

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Abstract

The structural changes taking place in dairying during the nineteenth century are examined in the context of the supply responsiveness of farmers. The paper both responds to a call for this issue to be researched in specific localities and seeks to place the debate in a wider context by taking a long chronological view. This study suggests that milk as opposed to cheese or butter production was embarked upon not as a straightforward response to market forces but as a result of the coalescence of many factors. It is noted that the specific factors may vary over time as might the level of their influence over the farmers' decision taking. The conclusion is that while there were some laggardly farmers, there was, taking all factors into consideration, a fairly prompt response. The research reveals the diversity of practice in the locality and cautions against generalization on the subject.

ALTHOUGH both the supply responsiveness of farmers and the level of dairy output in the nineteenth century have been the subject of much attention by agricultural historians, study of the first has tended to concentrate upon the early nineteenth century and has analysed responsiveness primarily in terms of meat and grain whilst research into the second has generally examined the dairy industry in the latter part of the nineteenth century, usually in relation to urban markets.¹

The extent to which farmers adjusted their production to market demands has been debated since at least the mid-nineteenth century. Farmers have been accused

of being stubborn or laggardly, or at least, slow in responding to change.² More recently the emphasis of the debate has shifted and, although some historians have continued to support the idea of farmer insensitivity to market forces, others, such as Glenn Hueckel and Cormac Ó Gráda, have presented evidence which suggests the opposite.³

The recent studies of dairy output by historians such as Edith Whetham, Peter Atkins and David Taylor, have tended to concentrate either on the London milk trade or on structural changes in the industry in the latter part of the nineteenth century. David Taylor, in a series of articles, examines the dairy industry between 1860 and 1930 using the county as the unit of analysis.⁴ He noted that this is unsatisfactory as counties cannot be regarded as homogeneous regions and he called for detailed research at sub-county level in order to identify more clearly the mechanisms and

* I am indebted to Dr John Chartres and two anonymous referees for their helpful comments on an earlier draft of this paper. Responsibility for any shortcomings, however, remains my own.

¹ G Hueckel, 'Relative Prices and Supply Response in English Agriculture during the Napoleonic Wars', *Econ Hist Rev*, 2nd ser, XXIX, 1976, and 'Agriculture during industrialisation' in R Floud & D McCloskey, *The Economic History of Britain since 1700*, 1, Cambridge, 1981; C Ó Gráda, 'Agricultural Decline 1860-1914', *ibid*, 2; E H Whetham, 'The London Milk Trade 1860-1900', *Econ Hist Rev*, 2nd ser, XVII, 1964-5, and *The London Milk Trade 1900-1930*, Reading, 1970; D Taylor, 'London's Milk Supply, 1850-1900: A Reinterpretation', *Ag Hist*, 45, 1971, 'The English Dairy Industry, 1860-1930: the Need for a Reassessment', *Ag Hist Rev*, 22, 1974, 'The English Dairy Industry, 1860-1930', *Econ Hist Rev*, 2nd ser, XXIX, 1976, and 'Growth and Structural Change in the English Dairy Industry, 1860-1930', *Ag Hist Rev*, 35, 1987; P J Atkins, 'The Growth of London's Railway Milk Trade, 1845-1914', *Jnl Trans Hist*, IV, 1975; T W Fletcher, 'Lancashire Livestock Farming in the Great Depression', *Ag Hist Rev*, 9, 1961.

² J Caird, *English Agriculture in 1850-1*, 1852, 2nd ed, 1967 with introduction by G E Mingay, pp xxxi-xxxii, 498-9; W E Bear, *The British Farmer and His Competitors*, 1888, pp 104, 115-6; P A Graham, *The Rural Exodus*, 1892, pp 193-4.

³ For discussion of the debate see Hueckel, 1976, *op cit*, pp 401-14; *idem*, 1981, *op cit*, pp 185-6; Ó Gráda, *op cit*, pp 179-82.

⁴ See footnote 1.

timing of change in dairy production.⁵ Taylor's conclusions accord with T W Fletcher's earlier findings in respect of farming in Lancashire during the Great Depression. Fletcher noted a willingness 'to farm according to the dictates of the market'.⁶ Taylor also agrees with some of the findings of Hueckel and Ó Gráda. He notes that where there was resistance to change there were often good reasons such as 'favourable geographical factors and inherited skills'.⁷ However, he does observe that, on occasions, there was a strong resistance to change for less than sound reasons.⁸

The present paper has essentially three objectives. It responds to Taylor's plea and closely examines the dairy industry at sub-county level in a specific locality – Wensleydale and Swaledale; it seeks to demonstrate the importance of taking a longer view (from the late eighteenth to the early twentieth centuries) in order that change may be seen in a wider context; and, finally, it identifies the extent to which dairy farmers in the two dales were supply responsive. In addition, the paper shows that considerable differences in the type of dairy output could occur within a small area and that the differences, while partly due to opportunism by some farmers, were dictated also by factors exogenous to dairy production and demand, such as transport and marketing. While it may be unwise to draw firm conclusions from the particular, this case study enables some tentative conclusions to be reached about dairy production and supply responsiveness nationally for the whole of the nineteenth century, and will provide a useful basis against which to test research in other regions.

I

The development of the dairy industry nationally in the nineteenth century was a direct response to the growing population and rising per capita income, and in the early years of the century the production of cheese, butter, and liquid milk all increased.⁹ Important structural changes in the output of dairy products occurred, however, in the latter part of the nineteenth century. Although total production of milk hardly changed in the last quarter of the century, the proportion which was converted into cheese and butter fell to 45 per cent in 1870, to 30 per cent in 1894–8 and to 23 per cent in 1907.¹⁰ The reasons for these changes become apparent when the different elements of the industry are examined. Cheese was the least perishable of the dairy products and during the first half of the nineteenth century was produced in increasing quantities for the expanding home market.¹¹ However, from the 1860s good quality imports were causing problems for home producers and there were steep falls in prices, particularly in 1879, 1885 and 1895.¹² Farmers moved out of cheese-making, and home production declined by about two-thirds between the 1860s and the First World War.¹³ Butter output followed a similar trend to that of cheese. In the 1850s and 1860s output was high but from the 1860s prices fell, and between the 1860s and 1900s the volume of milk used in butter-making halved from 150 million gallons to 75 million gallons.¹⁴ The decline in the quantity of milk used in the production of cheese and butter was mirrored by a growth in liquid milk production. With the development of the railway in the 1840s liquid milk was increasingly transferred

⁵ Taylor, 1987, *op cit*, p 48.

⁶ Fletcher, *op cit*, p 102.

⁷ Taylor, 1976, *op cit*, p 594; 1987, *op cit*, p 50.

⁸ *Ibid*, p 52.

⁹ J D Chambers & G E Mingay, *The Agricultural Revolution 1750–1880*, 1966, pp 109–10.

¹⁰ Fletcher, *op cit*, p 104; Taylor, 1976, *op cit*, p 585.

¹¹ National production of cheese is estimated to have been between 1.5 and 1.75 million hundredweight by the 1860s, *ibid*, p 590.

¹² *Ibid*, p 591.

¹³ *Ibid*, p 590.

¹⁴ Taylor, 1987, *op cit*, p 55.

direct from the farm to the town.¹⁵ This traffic developed and grew rapidly in the last quarter of the nineteenth century. The rapid expansion of milk rail traffic does not signify that there was no liquid milk market prior to the mid-nineteenth century. As will be seen, where local conditions were conducive, liquid milk formed a substantial element of dairy output in the late eighteenth and early nineteenth centuries. A major factor in the growth of liquid milk output in the late nineteenth century was the relative profitability of that commodity, in the context of falling prices of other dairy produce and meat. This encouraged some farmers to expand their dairy herds and reduce output of meat, cheese and butter in order to concentrate on the production of liquid milk.¹⁶ The question which arises is, at what point did traditionally conservative farmers take the decision to effect fundamental changes in their dairy output and what persuaded them to follow this course? Was it only a question of price, or were other issues involved? By examining the timing of structural changes in dairy production in Wensleydale and Swaledale during the nineteenth century, the factors which gave rise to those changes can be precisely identified and the extent to which farming was supply-responsive can be assessed.

II

The terrain of Wensleydale and Swaledale, which comprises a mixture of fertile valleys, sloping hillsides and high moorlands, is well

suited to dairy farming (see Map 1). There had been a strong tradition of cheese- and butter-making in the area prior to the nineteenth century, particularly in Wensleydale. Arthur Young in 1771 noted that in Swaledale milk was sold mainly in liquid form to meet the demands of the large lead-mining workforce whereas in Wensleydale it was mostly converted into cheese and butter.¹⁷ During the nineteenth century the production of cheese and butter became firmly established in Wensleydale, with the main emphasis on the less-perishable cheese. This was due to the fact that prior to the arrival of the railway the only market for liquid milk was the local population and as there was a relatively large dairy herd in Wensleydale, a high proportion of the milk produced had to be converted into cheese and butter.

The efficient marketing of the dairy produce was vitally important for the success of the local industry. Initially cheese and butter were collected from the farms by local factors and transported out of the area to produce fairs (of which Yarm was the most important for Wensleydale cheese) or sold direct to city retailers.¹⁸ As the nineteenth century progressed the farm-collection method of marketing was criticized as being unsatisfactory because factors did not discriminate between the quality of produce on the different farms.¹⁹ Cheese and butter markets and annual fairs were established at the market towns of Hawes and Leyburn in Wensleydale from as early as the 1840s so that the produce was sold in open competition and the prices reflected differences in quality.²⁰ The markets and

¹⁵ *Ibid.*, p 57. R H Rew, 'An Inquiry into the Statistics of the Production and Consumption of Milk and Milk Products in Great Britain', *JRSS*, LV, 1892, pp 262-4. The establishment of urban cowhouses further increased the supply of liquid milk to town dwellers. From the mid-nineteenth century some Wensleydale farmers supplied lactating cows to relatives who managed urban cowhouses particularly in Liverpool, information supplied by R Ewbank, Liverpool; local oral tradition; and J Grundy, 'Origins of Liverpool Cow Keepers', unpublished MPhil Thesis, University of Lancaster, 1982.

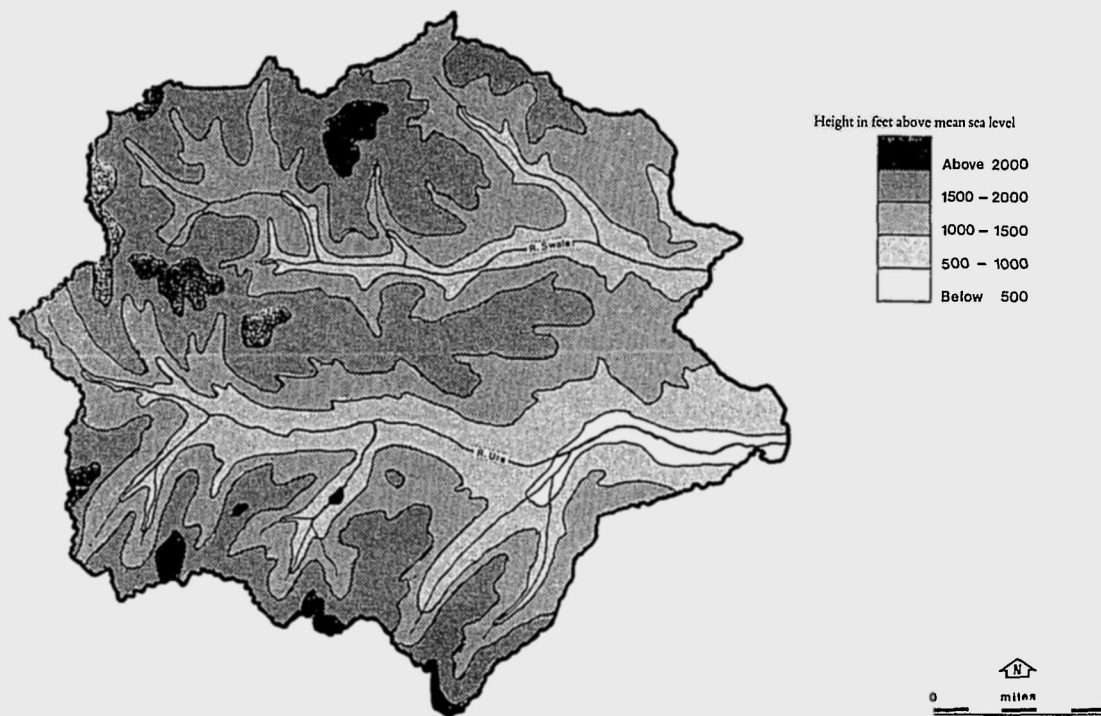
¹⁶ Taylor, 1987, *op cit.*, p 57.

¹⁷ A Young, *A Six Months' Tour Through the North of England*, 1771, II, pp 189, 424.

¹⁸ *Ibid.*, pp 13-4; *Wensleydale Advertiser*, 22 October 1844.

¹⁹ *Ibid.*, 27 February and 22 October 1844.

²⁰ *Ibid.*, 9 April 1844; W Livesey, 'Wensleydale and its Dairy Farming', *Journal of the British Dairy Farmers Association*, 2, 1879, p 46; *Bedale and Northallerton Times*, 30 June 1888. During the 1840s the local price of cheese fluctuated between 51 and 65 shillings per cwt. The price of cheese sold at Hawes market on any day in the 1840s varied by about three shillings per cwt reflecting the different quality, *Wens Adv.*, 1844-48, *passim*.



MAP I
Wensleydale and Swaledale: Relief and Drainage

fairs were attended by city cheese factors from as far afield as Tyneside, Teesside and the West Riding.²¹

The variable quality of farm-produced cheese and butter in the two dales indirectly contributed to a further change in dairy production. While output was largely for local and regional consumption and there was little competition the variable quality was evidently not a major retarding factor to sales. However, output grew as the nineteenth century progressed, local cheese was sold to urban markets further afield and fierce competition with both home and foreign producers developed. As a result

increasing emphasis was placed on improvement of technique and quality.²² This eventually forced structural changes in production and by the late nineteenth and early twentieth centuries, in order to standardize production and respond positively to competition particularly from the earlier establishment of cheese factories in other areas, several commercial cheese and butter dairies were established in Wensleydale.²³ This movement was not

²² T C Calvert, *Wensleydale Cheese*, Clapham, 1946, 2nd edn, 1977, pp 12-3; J H Dugdale, 'Select Farms in the Darlington District', *JRASE*, VI, 1895, p 526. In 1888 the Earl of Wharnccliffe established a dairy school for the benefit of tenants on his estate near Hawes, *Bed North Times*, 26 June 1888. Wharnccliffe may have been responding to a government scheme offering a grant to aid dairy schools which were already in existence or which were established before the end of 1888, W E Bear, *op cit*, p 161.

²³ Livesey, *op cit*, p 49; Taylor, 1987, *op cit*, pp 50-1; G E Fussell, *The English Dairy Farmer 1500-1900*, 1966, p 291; Calvert, *op cit*, pp 13-6.

²¹ *Wens Adv*, 8 and 22 October 1844.

repeated in Swaledale where even in the late nineteenth century cheese and butter production remained less important than in Wensleydale.²⁴ By the early twentieth century, although cheese and butter continued to be produced on the farm, most of the dales' output came from commercial dairies.²⁵

Before the era of the railway, the butter and cheese which were exported from the dales to the West Riding followed the drove roads southwards through Wharfedale and on to Bradford, Halifax and other West Riding towns and to Lancashire.²⁶ The arrival of the railway brought about major changes in marketing strategy, and from the 1850s and 1860s cheese and butter were transported from upper Wensleydale by cart to the nearest station.²⁷ This rail traffic was substantial. For example, it has been calculated that over 12,000 pounds of butter were forwarded by rail from Aysgarth to Bradford in early 1877.²⁸ Large quantities of butter, sometimes in excess of 7000 pounds but usually in the region of 3000 pounds, were also sold at Hawes market for export by rail.²⁹ The establishment of cheese and butter fairs within Wensleydale in the nineteenth century and the opening of the full length of the Wensleydale railway in 1878 led to the West Riding supplanting Yarm and the north-east as the main

destination for dales' produce.³⁰ By 1907 the Yarm Cheese Fair was virtually defunct.³¹

From the 1850s, therefore, Wensleydale farmers were responding to demand and competition partly by utilizing a new resource (the railway) to export their dairy produce, and partly by modifying their farming practice and sending whole milk to local commercial dairies. However, this level of response was not radically different from former times, in that Wensleydale was still primarily a cheese- and butter-producing area and many farms continued to make their own dairy products. Significant structural changes in the local dairy industry occurred only when farmers commenced exporting milk.

III

The prices that dairy farmers obtained for their produce was a major consideration in determining the emphasis of their production. Some cheese and butter prices are available for Wensleydale and Swaledale at different dates throughout the period under study. Indices for butter and cheese have been calculated from extant data and are presented in Figure 1. These prices show that, in line with national trends, the price of dairy products generally moved upwards during the nineteenth century. There had been a rapid increase at the end of the eighteenth century.³² Cheese, 2d per pound in 1771, had risen to 8d per pound in 1810.³³ There was a slight decline in the difficult years of the 1820s and again in the 1840s. By the 1860s, however, the price had recovered to 7d a pound and by 1873 reached

²⁴ Swaledale cheese and butter continued to be marketed, usually via factors or special fairs, direct from farmer to city buyer.

²⁵ Calvert, *op cit*, pp 13, 44.

²⁶ HLRO, Minutes of Evidence, HC, 1865, Vol 57, Skipton, Wharfedale and Leyburn Railway Company, evidence of T Airey, p 13.

²⁷ HLRO, Minutes of Evidence, HC, 1866, Vol 30, Midland (Settle-Carlisle) Railway Company, evidence of the Earl of Wharnccliffe and C Other, pp 10, 21.

²⁸ Bell MSS, North Eastern Railway Company (NER), Aysgarth Invoices, April, 1877, additional information supplied by the late R Hugill, former manager of Askrigg Dairy.

²⁹ Livesey, *op cit*, p 46; J Murray, *Handbook for Travellers in Yorkshire*, 1882, p 319. The afternoon train which departed from Hawes on Tuesdays was instructed to wait until the market-day butter was ready to be transported, *NER Traffic Details*, c 1905, document in the possession of P Moore.

³⁰ Bell MSS, 1877, *op cit*; Weatherald MSS, NER Telegraphs to Askrigg, 1881.

³¹ *Darlington and Stockton Times*, 26 October 1907.

³² Hueckel, 1981, *op cit*, pp 186, 192, 195. See C S Hallas, 'Economic and Social Change in Wensleydale and Swaledale in the Nineteenth Century', PhD Thesis, Open University, 1987, pp 615-7, for sources of prices used in the text.

³³ All prices used in this paper are current prices. The fourfold increase in the price of cheese between 1771 and 1810 did not necessarily result in a similar increase in profit for the farmer as costs (eg labour) were also rising rapidly at this time.

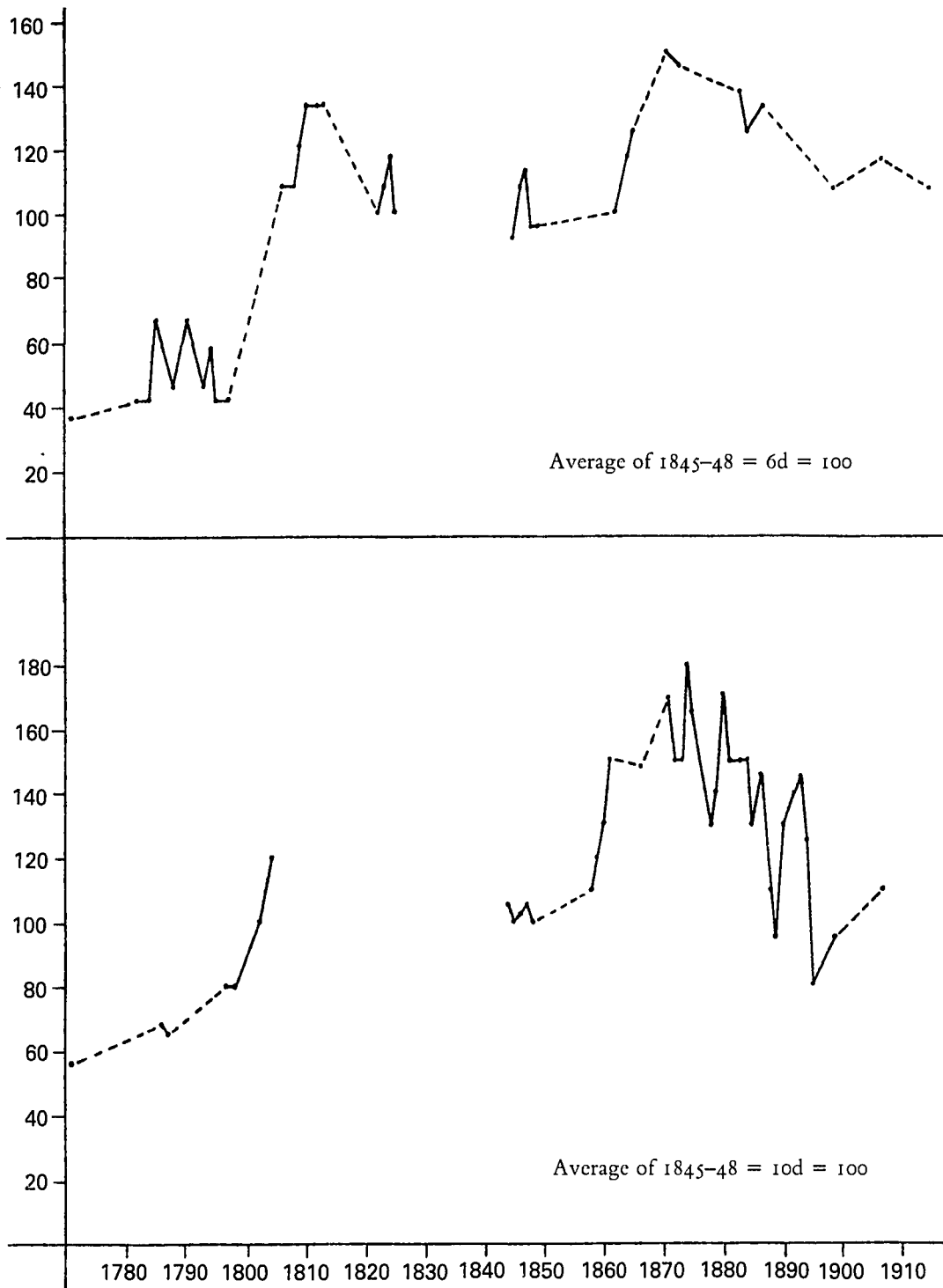


FIGURE 1

Indices of current prices for Wensleydale and Swaledale cheese (1771-1915) and butter (1771-1907)

Source: See text and Hallas, *op cit*, pp 615-7

a peak of 8³/₄d per pound. The price fell to a low point in the mid-1890s when a local newspaper reported 'a sudden and tremendous depression' in the price of cheese.³⁴ This fall in price acted as a spur to farmers to become more responsive to demand and radically to alter the emphasis of their dairy production. There was a recovery in the price of cheese at the turn of the century and in 1907 the wholesale price rose to 7d a pound. This was followed by a further fall and immediately prior to the First World War the price was 6¹/₂d.

Butter sold locally at 5¹/₂d a pound in 1771 and by 1804 had risen to 1s. During the 1840s the price was lower than that of 1804 but the price advanced in the 1850s and 1860s and reached a peak of 1s 6d in 1874. The price declined in the 1890s and, as in the case of cheese, a low point was reached in 1895 when the price had fallen to 8d. This was followed by a recovery in the early twentieth century and the price rose to an estimated 1s 4d in 1913-4.³⁵

IV

In order to ascertain the responsiveness of dales' farmers to both the price of and demand for dairy produce, the numbers of dairy cattle and the output of milk in Wensleydale and Swaledale have been calculated.³⁶ It is not easy to quantify the average annual yield of the nineteenth-century Wensleydale and Swaledale shorthorn or to

measure the different end products of that yield. However, assuming an annual average yield per head of dairy cattle of 300 gallons, total milk output of the Wensleydale and Swaledale for specific years between 1795-1839 has been estimated (Table 1).³⁷

Even if the less reliable 1795 figure is discounted, milk output rose over the period as a whole.³⁸ During the early part of the nineteenth century the only milk kept as liquid milk was that intended for consumption by the local population. Liquid milk consumed in the two dales between 1795 and 1839 has been estimated and is shown in Table 2.³⁹

The basis of the calculation employed means, necessarily, that the peak of milk consumption in the two dales reflects the population peak.

Milk remaining after requirements for liquid milk had been satisfied was converted into cheese and butter. In Wensleydale, which had a much higher production of milk relative to its population than Swaledale, proportionately less of the total milk output was consumed in liquid form and more was available for conversion into cheese and butter. In order to calculate cheese and butter output, it has been assumed that 70 per cent of the remaining proportion of total milk went into cheese

³⁴ *Darl Stock Times*, 21 September 1895.

³⁵ For most years it is not possible to determine accurately the average price of cheese and butter. The price data, particularly in the early part of the period, are sparse and prices varied at different times of the year. Further, in the case of cheese, prices varied according to age and quality. The prices presented here, therefore, are a 'rule of thumb' guide only. Full details of the methods and sources used in ascertaining the annual price of cheese and butter are discussed in Hallas, *op cit*, pp 615-7.

³⁶ The estimates concerning the dairy industry have been derived for the early part of the century (1795-1839) from an analysis of previously unexploited tithe collection material and for the latter part of the century (1860s-1917) from Census and MAFF returns and from the detailed returns of local railway traffic. These two periods are examined separately as the source material is very different and while the later returns are reasonably accurate no similar assumption can be made for the earlier tithe returns.

³⁷ The estimates used here are based on contemporary and recent calculations and have taken account of 'unproductive' milk. For a detailed discussion of yields see Hallas, *op cit*, pp 618-20. In order to construct as full a picture as possible, extant data for Swaledale for 1795, 1823, 1833, 1839 have been applied to Wensleydale and extant data for Wensleydale for 1803, 1811, 1819 have been employed to generate Swaledale estimates (for further details see Hallas, *op cit*, pp 611-2). The trend information in respect of total milk output simply reflects changes in the size of the dairy herd over the period.

³⁸ The Swaledale tithe collection returns for 1823-39 are all of the same type as are the Wensleydale tithe collection returns for 1803-19. However, while the 1795 tithe return follows the same format as the later returns, the difference in the number of stock etc recorded in that return, as compared with the later returns, suggests that the data may be deficient and should, therefore, be treated with caution.

³⁹ The local consumption of milk is extremely difficult to estimate with any accuracy. The consumption figures used here are based on both contemporary and present-day estimates, see Hallas, *op cit*, pp 621-2.

TABLE 1
Total milk output in Wensleydale and
Swaledale, 1795-1839*

	Wensleydale		Swaledale	
	C&H†	Total milk	C&H†	Total milk
1795	1285	385,500	837	251,100
1803	2870	861,000	1880	564,000
1811	2797	839,100	1832	549,600
1819	2821	846,300	1848	554,400
1823	3363	1,008,900	2191	657,300
1833	3270	981,000	2130	639,000
1839	3402	1,020,600	2216	664,800

* In gallons estimated at a net annual average output of 300 gallons per head of cow and heifer in milk or in calf (ie after allowance has been made for calf milk and wastage).

† Cows and heifers in milk or in calf.

Source: Barker MSS, 7/3,6,10,12, Grinton Parish Tithe Collection Records, 1795, 1823, 1833, 1839; Calvert MSS, Tithing Books for the Constabulary of Bainbridge, upper Wensleydale, 1803, 1811, 1819.

TABLE 2
Liquid milk consumption in Wensleydale and
Swaledale, 1795-1839

	Wensleydale		Swaledale	
	Population*	Milk†	Population*	Milk†
1795	7156	81,623	5739	65,461
1803	7156	81,623	5739	65,461
1811	7478	85,296	7040	80,300
1819	8322	94,923	7480	85,319
1823	8322	94,923	7480	85,319
1833	8614	98,253	7020	80,072
1839	8188	93,394	6758	77,083

* Population at the nearest decennial census.

† Estimated at a consumption of 0.25 pints per person per day. For a discussion on this estimate see C S Hallas, 'Economic and Social Change in Wensleydale and Swaledale in the Nineteenth Century', PhD Thesis, Open University, 1987, Appendix VIII, pp 621-2.

Source: North Yorkshire County Record Office (NYCRO), PP/1,3,5,8,10, Census Enumeration Abstract for the County of York, 1801-41, and see Table 1.

and 30 per cent went into butter as is shown in Table 3.⁴⁰

From the foregoing tables and the extant price data it is possible to estimate the total receipts from liquid milk, cheese and butter for the period 1795-1839 and from these derive the value of the product per cow (see Table 4). In addition to a considerable rise

⁴⁰ This proportion has been used because Wensleydale and Swaledale were primarily cheese producing areas, see Hallas, *op cit*, pp 623-5.

TABLE 3
Quantities of cheese* and butter† (in pounds)
produced in Wensleydale and Swaledale,
1795-1839

	Wensleydale		Swaledale	
	Cheese	Butter	Cheese	Butter
1795	212,714	30,388	129,947	18,564
1803	545,564	77,938	348,977	49,854
1811	527,663	75,380	328,510	46,930
1819	525,964	75,138	328,357	46,908
1823	639,784	91,398	400,387	57,198
1833	617,923	88,275	391,250	55,893
1839	649,044	92,721	411,402	58,772

* Based on a local conversion factor of one gallon of milk to one pound of cheese.

† Based on a local conversion factor of three gallons of milk to one pound of butter.

Source: based on an estimate of the proportion of total milk used in cheese and butter output.

in the output of liquid milk, cheese, and butter between 1795 and 1803, the price of all three commodities rose sharply. As a consequence, receipts from dairy products rose steeply, increasing almost fourfold in Wensleydale and more than fourfold in Swaledale. There was a further rise both in output and prices up to 1811, when receipts from dairy produce in Wensleydale and Swaledale peaked at £24,415 and £16,503 respectively.

Subsequent variations in output and prices were reflected in fluctuations in receipts which ended this period, in 1839, slightly down on the 1811 peak. In terms of the value of dairy produce per cow, Swaledale consistently achieved a higher return than Wensleydale. The substantial non-farming population in Swaledale created a higher demand for liquid milk which, consequently, was more remunerative than cheese or butter.⁴¹ This emphasis on liquid milk

⁴¹ There is also a strong tradition, particularly in Swaledale, of miners keeping a cow for family use. Over 63 per cent of all people in Swaledale paying agricultural tithes in the early nineteenth century were paying tithes on milk only and most had only one or two cows. Barker MSS, 7/6,10,12, Grinton Parish Tithe Collection Records, 1823, 1833, 1839. However, these people constituted only a small proportion of the local non-farming population and the average size of dairy herd on the Swaledale farms visited by Young in 1771 was six cows, Young, *op cit*, p 192.

benefited the Swaledale farmer both in terms of higher prices and lower labour input. It would appear that little had changed between 1771 when Arthur Young reported the product of Swaledale and Wensleydale cows as £5 10s and £4 12s 6d respectively, and 1795 when the product per cow was £5 and £4 6s respectively.⁴² The highest return of dairy product per cow for both Wensleydale and Swaledale in this period was in 1811 when agricultural prices nationally were near their peak.⁴³ Thereafter the product per cow fell to a low point in 1833 before recovering to 1839 as the two dales emerged from the effects of the 1830s depression.⁴⁴

For the later nineteenth century, estimates of milk output can be based on the more reliable MAFF returns (see Table 5).⁴⁵ As

TABLE 4
Value of liquid milk, cheese and butter
produced in Wensleydale and Swaledale,
1795-1839*

	Milk†	Cheese	Butter	Value‡	Product§
<i>Wensleydale</i>					
1795	1360	3,102	1045	5,507	4.3
1803	2381	14,776	3572	20,729	7.2
1811	2743	17,589	4083	24,415	8.7
1819	2769	15,341	3757	21,867	7.8
1823	2571	17,327	4189	24,087	7.2
1833	2456	15,448	4046	21,950	6.7
1839	2335	17,578	4057	23,970	7.0
<i>Swaledale</i>					
1795	1637	1,895	638	4,170	5.0
1803	2182	9,451	2285	13,918	7.4
1811	3011	10,950	2542	16,503	9.0
1819	2844	9,577	2345	14,766	8.0
1823	2666	10,844	2622	16,132	7.4
1833	2335	9,781	2562	14,678	6.9
1839	2248	11,142	2571	15,961	7.2

* To the nearest £.

† Liquid milk.

‡ Total value.

§ Product per cow and heifer in milk or in calf as estimated from the tithe returns.

Note: the value is calculated on the price (or estimated price) received by the farmers as follows: liquid milk, 1795, Wensleydale = 4d per gallon, Swaledale = 6d; 1803, W/d = 7d, S/d = 8d; 1811, W/d = 8d, S/d = 9d; 1819, W/d = 7d, S/d = 8d; 1823, W/d = 6½d, S/d = 7½d; 1833, W/d = 6d, S/d = 7d; 1839, W/d = 6d, S/d = 7d; cheese, W/d and S/d, 1795 = 3½d per pound; 1803 = 6½d; 1811 = 8d; 1819 = 7d, 1823 = 6½d; 1833 = 6d; 1839 = 6½d; butter, W/d and S/d, 1795 = 8½d; 1803 = 11d; 1811 = 13d; 1819 = 12d; 1823 = 11d; 1833 = 11d; 1839 = 10½d.

Source: see Table 1 and Hallas, *op cit*, Appendices VI-VII, pp 615-625.

⁴² *Ibid*, pp 189, 424; Barker MSS, 7/3, Account of Grinton Tithes, 1795-6.

⁴³ The national peak in agricultural prices has been identified as occurring in 1812-3, Hueckel, 1981, *op cit*, p 182.

⁴⁴ The depression appears to have been quite harsh in the two dales forcing many people to leave the area, Barker MSS, 5/2/2, Garth Day Book, *passim*.

⁴⁵ For the latter part of the century the study area (which comprises twenty-five townships) is divided into upper and lower Wensleydale and Swaledale. Although some farm units extended across township boundaries, they were normally contained wholly within one of the three sub-divisions.

An average of four years in each decade has been used where possible for the MAFF returns in order to even out fluctuations. The years 1874-7 have been used as the returns from 1866 to the early 1870s are less reliable than the later returns, J T Coppock, 'The Agricultural Returns as a source for Local History', *Amateur Historian*, 4, 1958/9, p 55. The gap in the data between 1839 and the mid-1870s is unfortunate. The few narrative sources which exist point to a period of prosperity and increased output.

The earlier less reliable MAFF returns also indicate that the 1860s was a period of high output as the following Table shows:

Cows and heifers in milk or in calf in upper and lower Wensleydale and Swaledale, 1866 to 1874-7			
	1866	1869-70*	1874-7†
Upper W/d	3114	3795	3567
Lower W/d	678	760	763
Swaledale	1672	1935	1893

* Average of two years.

† Average of four years.

Source: PRO, MAF 68/79-80, 211, 268, 382, 439, 496, 553, MAFF Parish Summaries of June Returns, upper and lower Wensleydale and Swaledale, 1866, 1869-70, 1874-7.

From these figures it would appear that a nineteenth-century peak occurred for dairy cattle in upper Wensleydale and Swaledale in the late 1860s and early 1870s.

with the earlier period, changes in milk output mirror the size of the dairy herd. The reasons for the changes become apparent when the outputs of the different dairy products are examined in detail.

Local milk consumption for the period 1874-7 to 1914-17 has been estimated on the basis of demand in an area of potentially high supply and is shown in Table 6.⁴⁶ In Wensleydale the moderate fall in population

⁴⁶ BPP, 1843, XII, *Reports of Special Assistant Poor Law Commissioners on the Employment of Women and Children in Agriculture*, evidence of W Balderston, Hawes. Balderston notes that the 'poorer class subsist chiefly on oat-bread and milk' which they buy of the neighbouring farms'.

TABLE 5
Total milk output (in gallons) in Wensleydale
and Swaledale, 1874-7 to 1914-7*

	Wensleydale		Swaledale	
	C&H†	Total milk‡	C&H†	Total milk‡
1874-7	4330	1,732,000	1893	757,200
1884-7	4653	1,861,200	1794	717,600
1894-7	4410	1,764,000	1711	684,400
1904-7	4575	1,830,000	1746	698,400
1914-7	5120	2,048,000	1781	712,400

* Average of four years in each decade.

† Cows and heifers in milk or in calf.

‡ Total milk produced. Based on a net average yield of 400 gallons per cow or heifer in milk or in calf (ie after allowance has been made for calf milk and wastage). For a discussion of this yield, see Hallas, *op cit*, Appendix VII, pp 618-20.

Source: PRO MAF 68/382 . . . 2833, MAFF Parish Summaries of June Returns, Wensleydale and Swaledale, 1874-7 to 1914-7.

TABLE 6
Liquid milk consumption (in gallons) in
Wensleydale and Swaledale, 1874-7 to 1914-7*

	Wensleydale		Swaledale	
	Pop†	Consump‡	Pop†	Consump‡
1874-7	8176	186,515	5370	122,503
1884-7	8204	224,585	4717	129,128
1894-7	7079	209,937	3217	95,404
1904-7	6506	207,785	2520	80,483
1914-7	6320	216,263	2396	81,988

* Average of four years in each decade.

† Population at the decennial censuses, 1871, 1881, 1891, 1901, 1911.

‡ Total annual consumption in Wensleydale and Swaledale. Allowance has been made for changing per capita consumption and for adulteration. For details of calculation see Hallas, *op cit*, Appendix VIII, pp 621-2.

Source: PRO MAF 68/382 . . . 2833, *op cit*; NYCRO, PP19/23,24,30,34,37, *Census Enumeration Abstract for the County of York, 1871-1911*.

was offset by a rise in per capita consumption resulting in an overall increase in liquid milk consumption of 15.9 per cent. In Swaledale the steep fall in population far outweighed increased consumption per person and liquid milk consumption fell by 33.1 per cent.

The Wensleydale railway was opened in 1878 but it appears that little whole milk was exported prior to the 1890s and even

during that decade export was limited.⁴⁷ In the 1870s and early 1880s local farmers were still receiving high receipts for their traditional dairy output and although the liquid milk trade was expanding rapidly elsewhere, the dales' farmers saw no immediate need to take advantage of that trade. The benefit to be gained by releasing workers from onerous tasks and the slightly better price for liquid milk did not, at this time, outweigh the local farmer's natural resistance to change. However, the situation altered radically during the 1890s.

TABLE 7
Wensleydale liquid milk output for home consumption and for export (in gallons), 1890s to 1910s

	1890s	1900s	1910s
Local	209,937	207,785	216,263
Export	25,000*	550,000†	920,000‡
Total	234,937	757,785	1,136,263

* A 'rule of thumb' estimate for the mid-1890s of 22,000 gallons on the North Eastern Railway (NER) and 3000 gallons on the Midland line (see Hallas, 1986, *op cit*, p 29, for details of the railway companies). The first extant record of the export of milk from Wensleydale is for 1894. A report stated that 27,000 gallons of milk were exported from Wensleydale on the NER line in 1899 and that milk exports had been rising rapidly since 1894.

† 502,209 gallons were exported on the NER line in 1906, (information derived from PRO RAIL 527/1273), and 48,000 gallons on the Midland line. The Midland output has been calculated as a proportion of the NER output.

‡ 862,000 gallons exported on the NER line in 1915 and 60,000 gallons on the Midland line. This is calculated from the Leyburn output and projected to the other stations on the Wensleydale line.

Source: see Table 6; PRO RAIL 527/290, NER Minutes and Reports, 1905; PRO RAIL 527/1273, Report on the Wensleydale Pure Milk Society Depot, 1908; Pearson MSS, NER Leyburn Station Annual Traffic Returns, 1915.

The availability of detailed local railway data has enabled milk exports from Wensleydale to be calculated for the period 1894-7 to 1914-7. These exports have been added to local milk consumption in order to calculate total liquid milk output (see Table 7). The growth of liquid milk exports at the end of the nineteenth and the

⁴⁷ PRO RAIL 527/290, *Report of the proposed Wensleydale Pure Milk Society depot, 1905*. For a full discussion see C Hallas, 'The Social and Economic Impact of a Rural Railway: the Wensleydale Line', *Ag Hist Rev*, 34, 1986, 38-41.

beginning of the twentieth centuries resulted in an increasingly large proportion of the total milk production of Wensleydale being kept as liquid milk. By 1914-7 over 55 per cent of milk produced in Wensleydale was marketed in its liquid form.

All milk surplus to local consumption in Swaledale and to local consumption and export in Wensleydale was made into butter and cheese. The estimated quantities of cheese and butter produced from the available milk are shown in Table 8. Predictably, as liquid milk output increased in Wensleydale, cheese and butter production fell. Cheese and butter production reached a peak in Wensleydale in 1884-7 and then declined steadily for the rest of the period as farmers transferred into liquid milk sales.

TABLE 8
Quantities of cheese* and butter† (in pounds)
produced in Wensleydale and Swaledale, 1874-7
to 1914-7

	Wensleydale		Swaledale	
	Cheese	Butter	Cheese	Butter
1874-7	1,081,840	154,548	444,288	63,470
1884-7	1,145,631	163,661	411,930	58,847
1894-7	1,070,344	152,906	412,297	58,900
1904-7	750,551	107,221	432,542	61,792
1914-7	638,216	91,174	441,288	63,041

* One gallon of milk to one pound of cheese.

† Three gallons of milk to one pound of butter.

Source: based on an estimate of the proportion of milk used in butter and cheese output, see Hallas, 1987, *op cit*, pp 623-5.

Nevertheless, even in the 1890s, before the export market for liquid milk had fully developed, the market for 'tip-top Wensleydale' cheese was reported to be flourishing.⁴⁸ In Swaledale there was a

decline in both products to a low point in 1884-7 but thereafter there was a steady recovery until by 1914-7 output had almost returned to its 1874-7 level. This suggests that although national cheese and butter output declined steeply in the last quarter of the nineteenth century the decline was most apparent in those areas where there was another outlet for the milk produced.⁴⁹ Farmers in Swaledale suffered on two counts. They lost their important local market with the decline of the lead industry and they did not have the benefit of a local railway by which to export liquid milk. If they were to keep their dairy herds, most of the milk had to be converted into cheese and butter. The prospect of taking this apparently retrograde step persuaded many Swaledale farmers to move more fully into breeding and rearing cattle in the latter years of the nineteenth century.⁵⁰

The value of receipts from dairy products and the value of the product per cow for the period 1874-7 to 1914-7 has been estimated and the results presented in Table 9. Based on the earlier assumptions, it is argued that these estimates provide a reasonably close indication of the magnitude of the returns obtained by dales' farmers from dairy produce. The Table shows a considerable fall in income in both dales in the depression of the 1890s. This was due to the fact that, despite increased liquid milk output in Wensleydale, there was an overall fall in dairy production in both dales. Also, although the price of liquid milk was slightly higher in the mid-1890s than in the mid-1880s, the price of butter and cheese had fallen substantially. Whereas in Swaledale receipts from dairy produce recovered only slightly after the 1890s, in Wensleydale, due to the rapid growth in liquid milk sales, receipts recovered completely and by 1914-7

⁴⁸ In 1895 it was also reported that a first class cow whose milk was converted into the best Wensleydale cheese 'should be worth £30 to £36 from cheese alone', BPP, 1895, XVI, *RC on the Agricultural Depression, Report of R H Pringle on South Durham and Selected Districts of the North and East Ridings*, p 546.

⁴⁹ *Ibid*, p 547; Ó Gráda, *op cit*, p 181.

⁵⁰ Hallas, 1987, *op cit*, pp 202-5.

TABLE 9
Value of liquid milk, cheese and butter in
Wensleydale and Swaledale, 1874-7 to 1914-7*

	1874-7	1884-7	1894-7	1904-7	1914-7
<i>Wensleydale</i>					
Milk†	6,217	7,018	7,831	22,102	35,508
Cheese	39,442	38,188	28,988	21,891	17,285
Butter	10,625	9,547	6,371	4,914	4,559
Value‡	56,284	54,753	43,190	48,907	57,352
Product§	13.0	11.8	9.8	10.7	11.2
<i>Swaledale</i>					
Milk†	4,083	4,035	3,180	2,347	2,562
Cheese	16,198	13,731	11,166	12,616	11,952
Butter	4,364	3,433	2,454	2,832	3,152
Value‡	24,645	21,199	16,800	17,795	17,666
Product§	13.0	11.8	9.8	10.2	9.9

* Average of four years in each decade, value to nearest £.

† Liquid milk.

‡ Total value.

§ Product per cow and heifer in milk or in calf.

Note: the value is calculated on the wholesale price from farmers as follows: liquid milk, 1874-7 = 8d per gallon, 1884-7 = 7½d, 1894-7 = 8d, 1904-7 = 7d, 1914-7 = 7½d; cheese, 1874-7 = 8¾d per pound, 1884-7 = 8d, 1894-7 = 6½d, 1904-7 = 7d, 1914-7 = 6½d; butter, 1874-7 = 16½d per pound, 1884-7 = 14d, 1894-7 = 10d, 1904-7 = 11d, 1914-7 = 12d.

Source: For prices see Hallas, 1987, *op cit*, pp 615-7.

exceeded their 1874-7 level. The trend in the total value of the product per cow is comparable to the trend in the value of dairy products. A positive response to changing circumstances in Wensleydale led to an expansion of the dairy herd by 15.6 per cent in the upper dale and 30.5 per cent in the lower dale between 1874-7 and 1914-7. The converse was true in Swaledale where the dairy herd declined by 5.9 per cent over the same period.⁵¹ The data available for the early and later parts of the period allow some conclusions to be drawn about dairy output in the mid-nineteenth century. Figure 2 suggests that milk production in Wensleydale rose steeply, although not always smoothly, throughout the period. In Swaledale, however, it would appear that a

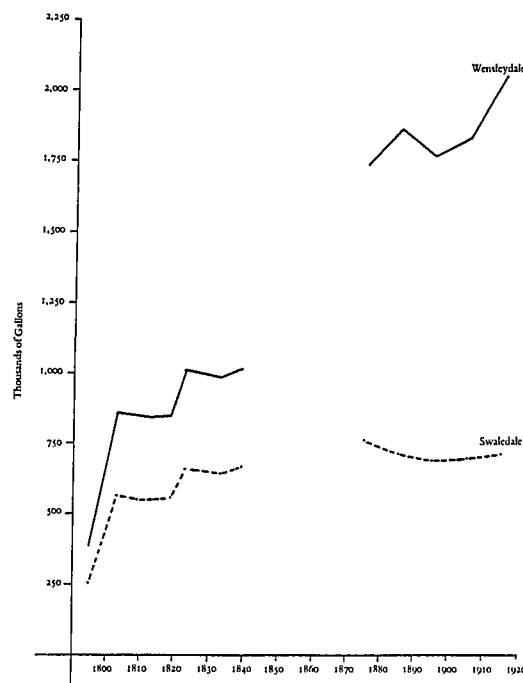


FIGURE 2

Total milk produced in Wensleydale and Swaledale, 1795-1917

Source: see text

peak in milk production occurred between 1839 and 1874-7.

Narrative sources and the earlier, less reliable, MAFF returns point to a probable nineteenth-century peak occurring for both Wensleydale and Swaledale in the late 1860s or early 1870s.⁵² After a fall in output Wensleydale recovered to reach a peak for the whole period in the early twentieth century while Swaledale never fully recovered from the late nineteenth-century fall.

⁵¹ PRO, MAF 68/382 . . . 2833, *op cit*, and Hallas, 1987, *op cit*, p 194, Table 9.5.

⁵² See note 45 concerning evidence from the earlier MAFF returns which suggests that milk output may have been high in the 1860s.

The production of liquid milk (see Figure 3) in Wensleydale and Swaledale was almost identical in the early part of the century. In Swaledale production may have reached a peak during the mid-nineteenth century. However, it is equally possible that the peak occurred in the 1880s, coincident with a rise in living standards and immediately prior to the final demise of the local lead industry and the deepening depression in the 1890s. The impact which the export of milk from Wensleydale had on the output of liquid milk in that dale is abundantly demonstrated by the way in which liquid milk production soared at the end of the century.

The production of butter and cheese in the two dales in the period 1795 to 1914-7

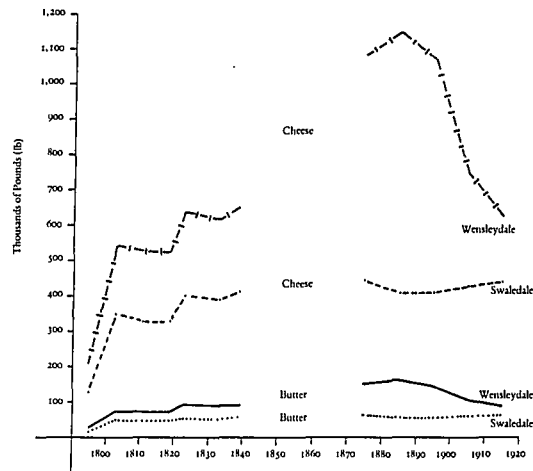


FIGURE 4
Butter and cheese production in Wensleydale and Swaledale, 1795-1917

Source: see text

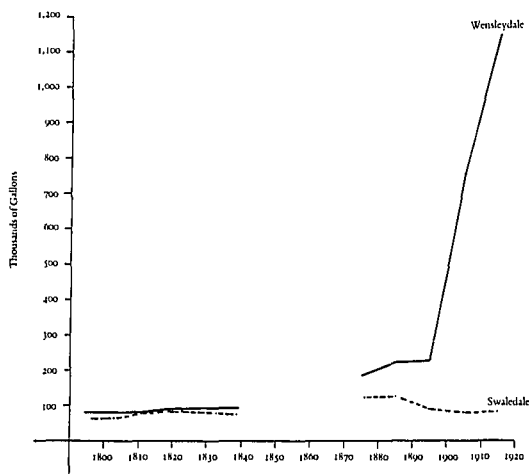


FIGURE 3
Liquid milk production in Wensleydale and Swaledale, 1795-1917

Source: see text

is shown in Figure 4. Cheese and butter output in Wensleydale rose over the mid-century period reaching a peak in the 1880s. Then, as the railway enabled them to increase liquid milk exports Wensleydale farmers moved out of cheese and butter production.⁵³ As with milk production, the output of cheese and butter in Swaledale probably reached a peak in the mid-nineteenth century, declining to a lower but relatively stable level in the latter part of the period. In the absence of a railway west of Richmond, Swaledale was less able to take advantage of the liquid milk trade. Nevertheless, dairy farmers in both dales were relatively more prosperous at this time and as Assistant Commissioner Hunter Pringle noted in 1895: 'Dairy farmers, expert and progressive cheese makers, . . . have

⁵³ For a discussion on the provision by Railway Companies for the transport of milk, see Hallas, 1986, *op cit*, pp 38-41.

done best, and among them depression, if it exists at all, is of a very mild type⁵⁴. The fortunes of the dairy industry in Wensleydale and Swaledale support the revisionist view that the late nineteenth-century depression was not uniformly severe. It affected both different regions and different sectors of livestock farming to different degrees.⁵⁵

Dairy produce receipts for Wensleydale and Swaledale in the nineteenth century are

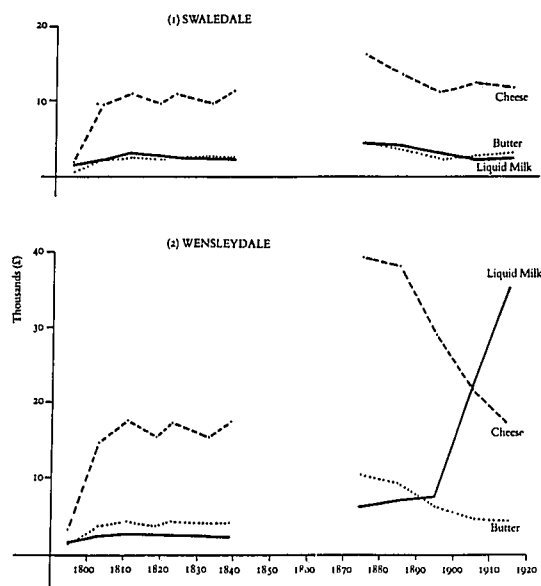


FIGURE 5

Dairy produce receipts at current prices, Wensleydale and Swaledale, 1795-1917

Source: see text

presented in Figure 5. The fact that dairy produce receipts are a function of two factors, output and price, is clearly shown in the way receipts for the different products follow markedly different paths. The pattern is similar in both dales in the early part of the century and there are indications that

total receipts from all dairy produce in the two dales, with the exception of liquid milk in Wensleydale, may have reached a peak during the mid-nineteenth century.⁵⁶ In the latter part of the period the positive move into liquid milk output in Wensleydale caused the pattern of receipts in Wensleydale and Swaledale to diverge sharply.

As noted earlier, between the 1860s and 1914 national production of cheese and butter declined by 40 per cent while liquid milk production quadrupled over the same period.⁵⁷ Wensleydale output followed the national pattern and the production of cheese and butter each suffered a decline of about 41 per cent between 1874-7 and 1914-7 while liquid milk output increased sixfold over the same period. In Swaledale, which did not have access to an urban market, liquid milk output declined by a third while cheese and butter output fell by less than 1 per cent over the same period.

The full significance of the buoyant returns for dairying can be appreciated when the total product per cow for Wensleydale and Swaledale is examined for the whole period 1795 to 1914-7 (see Figure 6). The peak of produce per cow achieved in both dales in 1811 during the French wars was not sustained, at least prior to 1839, and output slumped to a low point in the mid-1830s. It is possible, however, that produce per cow reached a peak in the unrecorded years of the 1860s when, in line with the rest of the country, prices were high.⁵⁸ The impact of the depression is graphically demonstrated with a decline in the value of produce per cow to a late nineteenth-century low point in the 1890s. It is only from this period that Wensleydale farmers suffered a substantial fall in the return from cheese and butter. After being relatively unresponsive to the growing demand for liquid milk prior to the 1890s they were belatedly pushed into utilizing the fifteen-year-old railway to

⁵⁶ See note 45.

⁵⁷ Ó Gráda, *op cit*, p 181.

⁵⁸ Taylor, 1976, *op cit*, p 593.

⁵⁴ BPP, 1895, *op cit*, p 567.

⁵⁵ *Ibid.*

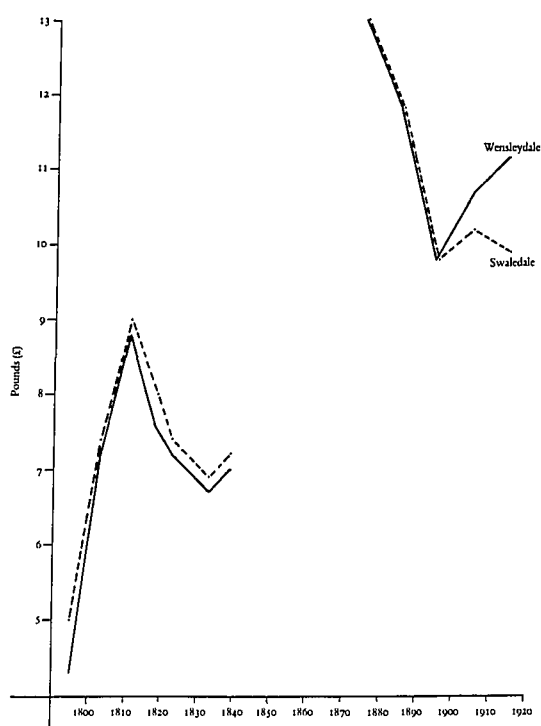


FIGURE 6
Value of produce per cow, Wensleydale and
Swaledale, 1795-1917

Source: see text

export milk from the dale. In addition, once they had started to export milk from the farms, the dairy farmers quickly recognized the advantages of communal marketing and organized themselves into co-operatives for the sale and distribution of dairy produce. The wisdom of this response is demonstrated in the results shown in Figure 6.

V

Liquid milk production was clearly an important element of the dairy economies of Wensleydale and Swaledale at different periods from the late eighteenth to the

twentieth centuries. Analysis of dairying in Swaledale demonstrates that there could be a substantial liquid milk market even in rural areas in the early nineteenth century and that, as was the case later in the century, liquid milk was the most profitable form of dairy output. In Wensleydale, milk which was not converted into farm cheese or butter was marketed in several ways. In the early part of the nineteenth century the requirements of the small, non-farming local population for liquid milk constituted the only market for milk. In the later years of the century, however, milk could also be sold as whole milk to local cheese and butter dairies and as liquid milk for rail-borne export from the dale.

The long-term view which is presented in this study has enabled the type and level of response throughout the nineteenth century to be identified and has demonstrated the complexity of the situation in terms of both cause and effect. The conclusion of this paper, albeit tentative due to the paucity of data and the use of estimates, is that throughout the nineteenth century a degree of supply responsiveness was to be found among Wensleydale and Swaledale dairy producers. This generally accords with the comments of Hueckel, Ó Gráda and Taylor. However, it is clear that the decisions of farmers in both dales were influenced by factors in addition to a straightforward response to demand and prices; there is evidence that resistance to change was not always based on sound business reasons. Where change did take place it was in response to two different types of stimuli. It is probable that the responsiveness of Swaledale farmers in the early part of the century was encouraged, or 'pulled', by the ease with which the switch from making dairy products to supplying liquid milk locally could be undertaken. When, from 1878, Wensleydale farmers were also presented with a market for liquid milk, although one that involved exporting, they were not so immediately

responsive.⁵⁹ The indications are that they could have moved into the more profitable liquid milk market relatively easily and with minimal cost any time after the opening of the railway but it required the rapidly falling prices of cheese and butter in the 1890s to 'push' them into changing their practice. Swaledale's ability to respond to the growth in per capita liquid milk consumption later in the century was severely constrained by the sharp reduction in its non-farming population. Moreover, exogenous factors, particularly the absence of a railway, meant that the Swaledale farmer, however progressive, was unable to respond to demand in regional and national markets.⁶⁰ Faced with this disadvantage many Swaledale

farmers responded by moving from dairying to breeding and rearing.⁶¹

It is apparent that caution needs to be exercised in making broad generalizations about the dairy industry and about the level of farmer responsiveness to changes in demand. This paper demonstrates clearly how the experience of dairy farmers and their response to change could be markedly different even within a relatively small geographical area. There is no question that farmers who survived in agriculture in the nineteenth century did respond to market forces but there is no simple answer as to when, how quickly, and why at that chosen time? Research into other regions is likely to confirm that the complexity of the situation which existed in Wensleydale and Swaledale is repeated in other localities throughout the country.

⁵⁹ This presupposes that the dales' farmers were not constrained by lack of markets and organization for the urban distribution of rail-borne milk. It appears that this was the case: an infrastructure existed in several large cities from the 1840s and, therefore, Wensleydale farmers could have sent liquid milk to the urban markets any time after the local railway had opened. Taylor, 1971, *op cit*, pp 34-37.

⁶⁰ People in Swaledale had promoted schemes for building a railway in the dale but none was successful. For a detailed discussion see C S Hallas, *The Wensleydale Railway*, Clapham, 1984, pp 4-18.

⁶¹ Between 1895 and 1915 the proportion of calves and young cattle in Swaledale rose from 30.5 to 33.3 per cent and 20.1 to 22.8 per cent respectively. Conversely in upper Wensleydale there was a decline in both categories, PRO, MAF, 68/1123, 2263, *op cit*, 1895, 1915.

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(continued on page 29)