



15 May 2013

Total factor productivity of the UK agricultural industry 2012 – 1st estimate

The latest National Statistics on total factor productivity of the UK agricultural industry were released on 15 May 2013 according to the arrangements approved by the UK Statistics Authority.

Total factor productivity of the agricultural industry in the United Kingdom is an indicator of how well inputs are converted into outputs, and of the efficiency and competitiveness of the industry. Year to year variations in total factor productivity may be due to weather conditions, disease outbreaks or other reasons.

This release presents the first estimate of total factor productivity of the UK agricultural industry and volume indices for 2012. Revisions may have also been made to previous years. A second estimate, incorporating data that becomes available later, is to be released on 12 December 2013.

Key points:

- Total factor productivity of the agricultural industry in the United Kingdom is estimated to have fallen between 2011 and 2012 by 3.2 per cent to its lowest level since 2004. This is the largest single year fall in total factor productivity since 1985. The fall in total factor productivity reflects the impact of poor weather on the agricultural production process during 2012.
- Over the longer period, the volume of final output has remained largely unchanged between 1986 and 2012 while the volume of all inputs and entrepreneurial labour fell by 19%, leading to total factor productivity increasing by 20 per cent. Total factor productivity was broadly level between the mid-1980s and mid-1990s, increased by 18 per cent between 1997 and 2005 and has since remained broadly level with year to year variations.

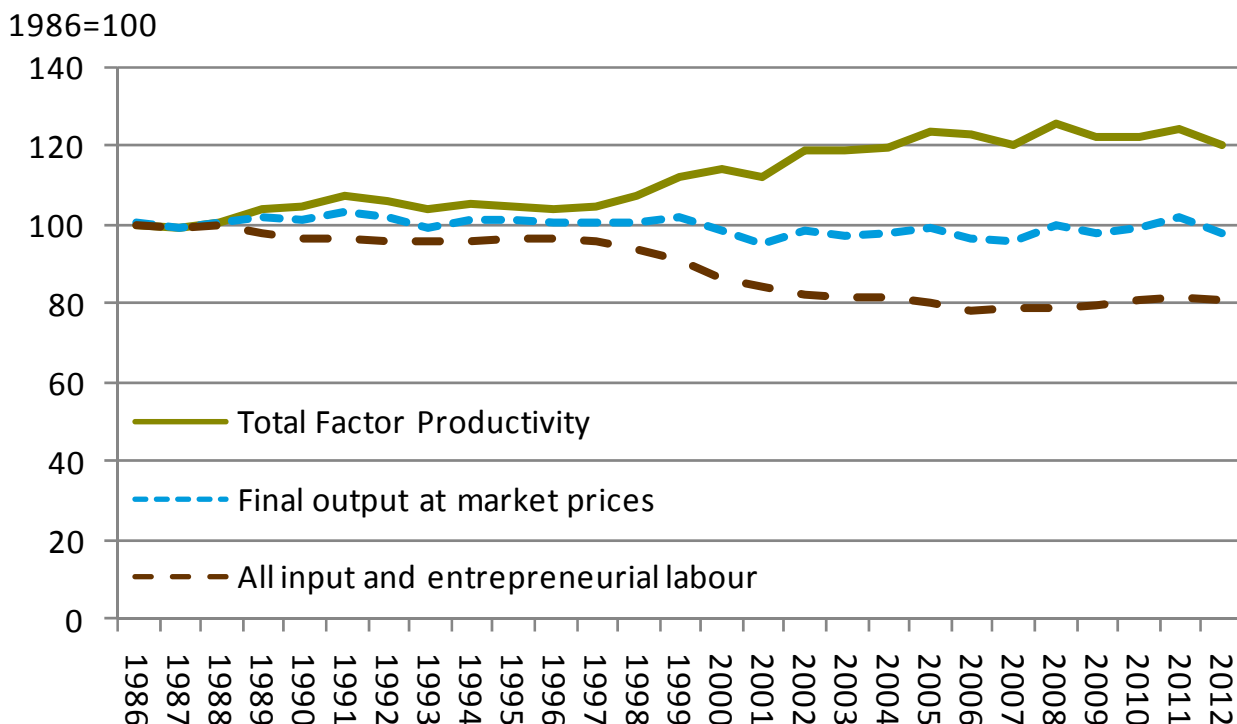
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Latest figures and long term trends

Figure 1 and Table 1 show the trends in total factor productivity, final output at market prices and all inputs and entrepreneurial labour between 1986 and 2012.

Figure 1: Total factor productivity of the UK agricultural industry



Total factor productivity of the agricultural industry in the United Kingdom is estimated to have fallen between 2011 and 2012 by 3.2 per cent to its lowest level since 2004. This is largely driven by a fall of 3.6 per cent in the volume of final output at market prices, partly offset by a 0.4 per cent fall in the volume of all inputs and entrepreneurial labour used in the production process. This fall in total factor productivity reflects the impact of poor weather during 2012 on agricultural activity.

This is the largest annual decrease in productivity since 1985 when there was a 3.7 per cent decrease in productivity. The decrease in 1985 was also due to poor weather conditions but 1985 followed a particularly productive year in 1984 when growing conditions were favourable. The decrease in productivity in 2012 was larger than that seen in 2001 when there was an outbreak of Foot and Mouth Disease in the UK. In 2001 there was a larger fall in outputs of 3.7 per cent but also a larger decrease in inputs of 1.8 per cent.

While weather conditions or other factors such as disease outbreaks may have short term impact on agricultural productivity, it is developments in productivity over a longer period that constitute one of the main drivers of agricultural income. Productivity growth means that more value is added in production and more income is available to be distributed.

Over the longer period, the volume of final output has remained largely unchanged between 1986 and 2012 while the volume of all inputs and entrepreneurial labour used in the production process fell by 19% leading to total factor productivity for the agricultural industry in the United Kingdom increasing by 20%. Total factor productivity was broadly level between the mid-1980s and mid-1990s, increased by 18 per cent between 1997 and 2005 and, has since remained broadly level with year to year variations

Table 1: Total factor productivity of the agricultural industry: 1986 to 2012

United Kingdom

1986 = 100	Final output at market prices	All inputs and entrepreneurial income	Total Factor Productivity
1986	100	100	100
1987	99	100	99
1988	100	100	100
1989	102	98	104
1990	101	97	104
1991	103	96	107
1992	102	96	106
1993	99	96	104
1994	101	96	105
1995	101	97	105
1996	100	97	104
1997	101	96	105
1998	100	94	107
1999	102	91	112
2000	99	86	114
2001	95	85	112
2002	98	83	119
2003	97	82	119
2004	98	82	120
2005	99	80	124
2006	96	78	123
2007	95	79	121
2008	99	79	126
2009	97	79	123
2010	99	81	122
2011	102	82	124
2012	98	81	120

Aggregate agricultural accounts: output and input indices

Table 4 shows output and input volume indices derived from the aggregate agricultural accounts. Values are expressed with a reference year of 2005 = 100.

The table shows that the volume of output at market prices is 4.8 per cent higher than five years previously in 2007, albeit with year to year variations. The volume of total crop output is 5.0 per cent higher than in 2007 while the volume of total livestock output is 2.4% higher.

Crop output was however particularly affected by poor weather during 2012, with the volume of wheat output falling by 11 per cent compared to 2011 to its lowest level since 2001. The volume of oilseed rape output fell by 7.3 per cent between 2011 and 2012 following very poor weather during spring and summer 2012, partly offset by an increase in area following favourable planting conditions in autumn 2011, but remained 28 per cent higher than in 2007. The volume of output of potatoes was down 28 per cent compared to 2011 as poor weather interrupted planting in the spring and led to low yielding potato crops and increased wastage. Output of sugar beet, down 14 per cent, and fruit, down 8.9 per cent, were also affected by cold and wet weather.

Total livestock output has increased by 2.4 per cent over the last five years. Livestock output was generally less impacted by the poor weather in 2012 other than sheep output, down 4.5 per cent, where poor weather in the second half of the year hampered the marketing of lambs resulting in a large carryover of the 2012 lamb crop into 2013.

The volume of inputs used in the production process has generally increased over the past five years. Total intermediate consumption is estimated to be 6.2 per cent higher than in 2007. Energy use has increased by 10 per cent in that period but the volume of fertiliser used has fallen by 12 per cent. Plant protection products have shown the largest increase of 44 per cent since 2007. In contrast to most of the other inputs, entrepreneurial labour has fallen by 2.5 per cent over the same period.

Description of total factor productivity

Total factor productivity is a key measure of the economic performance of agriculture and an important driver of farm incomes. It represents how efficiently the agricultural industry uses the resources that are available to turn inputs into outputs. Outputs and inputs are adjusted for quality by weighting the volumes by price.

Results are measured in terms of the trend in volume of output leaving the industry per unit of all inputs including labour. Changes from year to year are often shaped by factors outside the control of farmers, such as weather, animal disease, policy interventions, general economic conditions, and other factors, and are rarely the main driving factor behind short-term changes in farm income. However, over a longer period, developments in productivity constitute one of the major factors that impact on income.

These results are produced as part of the preparation of aggregate agricultural accounts required by EU legislation and by UK policy making. The accounts also produce other measures of the performance of the agricultural industry, including Total Income from Farming.

Definitions and explanations

Final output at market prices:	Output excluding subsidies linked to products
All inputs and entrepreneurial labour:	Goods and services consumed in the productive process and the labour of those with an entrepreneurial interest in the farm business, e.g. farmers, partners.
Gross output:	The total value of output by producing enterprises.
Total factor productivity:	An indicator of how well inputs are converted into outputs, and of the efficiency and competitiveness of the industry

Basic quality information

Estimates for 2012 are based on incomplete data. The amounts of data available are presented below. Over time, more data becomes available, estimates are revised and forecasts are replaced.

Table 2: Approx. amount of data available for 2012 values at April 2013.

	April 2013
Output	90%
Intermediate consumption	30%
Subsidies	95%
Other costs	55%

Revisions

All estimates, by definition, have an element of uncertainty that is inherent in any process or calculation that uses sampling, estimation or modelling. There is no simple way of measuring the accuracy of the estimates – that is, the extent to which estimates measures the underlying ‘true’ value for a particular period. One dimension of measuring accuracy is reliability, which is measured using evidence from analyses of revisions to assess the closeness of early estimates to subsequently estimated values.

The table in the section below presents a revision analysis of key values for 2011 that were published in May 2012, November 2012 and May 2013. Revisions have been made owing to further information becoming available.

Table 3: Revisions made to the 2011 estimate of total factor productivity between May 2012 and May 2013

1986 = 100	May-12	Dec-12	May-13	Revision May-12/ Dec-12	Revision Dec-12/ May-13
Final output at market prices	101.8	101.8	101.5	0.0%	-0.2%
All input and entrepreneurial labour	80.8	81.7	81.6	1.1%	0.0%
Total Factor Productivity	126.1	124.6	124.4	-1.1%	-0.2%

Development areas

Defra statisticians carry out a continuous review of methods employed in making estimates for elements of the production and income accounts. This may lead to revisions to data series owing to improvements in methods in addition to the use of later information.

Summary quality report

A summary quality report for this statistical release can be found on the GOV.UK website at <https://www.gov.uk/government/organisations/department-for-environment-food-rural-affairs/series/aggregate-agricultural-accounts>.

This is an overview note which is not release specific but will be reviewed and updated at regular intervals. It pulls together key qualitative information on the various dimensions of quality as well as providing a summary of methods used to compile the output. It relates to estimates of Total Income from Farming and aim to provide users with information on usability and fitness for purpose of these estimates.

Quality Assurance

Defra has in place quality assurance processes to check the accuracy and reliability of the aggregate agricultural accounts that includes:

- Ongoing review of methods employed in the calculation of the accounts.
- Assessment of the quality of the estimates of components of the accounts with internal experts.
- Discussion of components of the accounts with external experts.
- Quality assessments made by Eurostat, the statistical office of the European Union.

Main uses of total factor productivity

Total factor productivity is used in conjunction with other economic information to:

- Inform policy decisions and to help monitor and evaluate current policies relating to agriculture in the UK by Government and in the European Union by the European Commission.
- Inform stakeholders of the performance of the agricultural industry.
- Inform research into the economic performance of the agricultural industry.
- As an impact indicator of Government policy.

User engagement

As part of our ongoing commitment to compliance with the Code of Practice for Official Statistics <http://www.statisticsauthority.gov.uk/assessment/code-of-practice/index.html>, we wish to strengthen our engagement with users of these statistics and better understand the use made of them and the types of decisions that they inform. Consequently, we invite users to make themselves known, to advise us of the use they do, or might, make of these statistics, and what their wishes are in terms of engagement. Feedback on this notice and enquiries about these statistics are also welcome.

Publication policy

First estimates of Total Income from Farming and the production and income accounts for the UK agricultural industry are published at the end of April followed by more detailed information in the publication 'Agriculture in the United Kingdom'. The production and income accounts are then updated and published at the end of the following November when Farm Business Survey data is available to inform estimates of elements of intermediate consumption. The production and income accounts may be revised later as further data becomes available.

DEFRA publishes all of its statistics and releases on the GOV.UK internet site at <https://www.gov.uk/government/organisations/department-for-environment-food-rural-affairs/about/statistics>. Pre-announced publication dates can be found on the National Statistics Publication Hub at <http://www.statistics.gov.uk/hub/index.html>.

Table 2: Aggregate Agricultural Accounts : output and input volume indices

United Kingdom

2005=100

	2007	2008	2009	2010	2011	2012
1 Output of cereals	91.1	114.6	103.8	101.0	98.4	93.8
of which: wheat	88.7	114.7	95.1	99.5	97.4	86.7
barley	93.2	111.0	124.2	101.2	102.0	107.8
2 Output of industrial crops	84.6	98.0	99.7	101.2	118.4	122.4
of which: oilseed rape	111.1	109.7	106.3	124.0	153.3	142.1
sugar beet	77.5	88.0	97.3	75.1	97.9	83.9
3 Output of forage plants	76.3	81.9	104.9	94.5	82.0	65.0
4 Output of vegetables and horticultural products	93.4	95.2	93.0	96.5	94.2	93.8
of which: fresh vegetables	93.7	96.0	100.2	103.9	101.8	97.2
plants and flowers	93.4	94.4	84.9	88.1	85.6	89.5
5 Output of potatoes (including seeds)	91.6	98.9	100.4	83.7	90.1	64.6
6 Output of fruit	114.7	118.3	124.9	125.1	125.7	114.5
7 Output of other crop products including seeds	82.4	85.4	89.7	82.9	74.8	75.8
Total crop output	91.7	103.7	101.2	99.5	101.0	96.3
8 Output of livestock primarily for meat	99.3	99.8	96.4	98.7	102.6	102.6
of which: cattle	97.8	97.2	94.4	97.8	100.7	100.4
pigs	98.1	96.4	93.8	98.3	101.6	99.4
sheep	105.0	103.9	100.4	104.9	112.4	114.3
poultry	99.3	96.6	93.5	86.5	91.6	87.5
gross fixed capital formation	92.5	94.3	91.6	99.8	98.8	102.0
of which: cattle	108.9	116.5	109.8	105.8	115.8	117.8
pigs	103.6	123.0	105.0	96.6	103.8	112.0
sheep	110.9	125.1	110.8	122.9	133.7	148.2
poultry	131.7	92.6	115.4	120.0	140.4	131.1
9 Output of livestock products	105.5	108.0	123.3	127.6	132.9	124.9
of which: milk	96.5	95.2	94.4	98.1	99.3	97.1
eggs	97.2	95.0	93.9	96.3	97.8	96.3
Total livestock output	94.2	100.2	101.2	113.5	113.1	109.5
10 Other agricultural activities	98.2	98.0	95.6	98.4	101.3	100.5
11 Inseparable non-agricultural activities	102.4	116.6	125.3	131.2	129.8	128.1
12 Output (at market prices)	101.7	102.6	115.3	119.3	117.2	112.8
13 Total subsidies (less taxes) on product	96.1	101.2	99.7	101.1	103.2	100.7

14 Gross output (at basic prices)	96.1	101.1	99.6	101.0	103.1	100.6

continued

Table 2: Aggregate Agricultural Accounts : Volume indices

United Kingdom (continued)

2005=100

	2007	2008	2009	2010	2011	2012
Intermediate consumption						
15 Seeds	124.0	118.1	115.2	109.9	115.2	120.6
16 Energy	98.2	94.4	112.9	109.6	106.4	108.0
of which: electricity & fuels for heating	87.6	95.1	120.2	120.4	114.7	112.8
motor & machinery fuels	103.3	94.3	110.1	105.4	103.1	105.8
17 Fertilisers	95.4	84.8	76.8	86.9	90.4	84.4
18 Plant protection products	101.6	120.4	122.4	134.0	142.7	146.1
19 Veterinary expenses	99.7	117.1	124.1	121.6	121.7	124.1
20 Animal feed	97.7	99.0	99.9	106.2	98.3	98.5
of which: compounds	108.1	107.4	105.9	113.2	110.5	113.7
straights	86.3	91.5	91.0	101.9	87.7	84.3
feed produced & used on farm or purchased from other farms	85.5	85.2	98.3	90.1	77.1	74.3
21 Total maintenance	98.2	104.1	108.2	109.5	108.2	108.2
of which: materials	96.8	98.1	101.2	103.9	103.7	103.8
buildings	101.0	115.1	121.1	119.6	116.3	116.3
22 Agricultural services	103.8	118.2	127.0	133.0	131.6	129.9
23 FISIM	94.7	97.9	97.1	102.2	97.5	83.6
24 Other goods and services	93.7	97.1	99.9	97.4	100.2	101.4
25 Total intermediate consumption	98.6	100.8	103.2	106.2	104.9	104.7
26 Gross value added at market prices	91.5	101.8	93.7	92.2	99.9	93.8
27 Gross value added at basic prices	91.4	101.5	93.5	92.0	99.7	93.5
28 Total Consumption of Fixed Capital	96.8	99.7	94.8	96.7	102.5	104.2
of which: equipment	97.8	100.0	102.8	106.0	113.0	116.2
buildings	103.9	103.0	101.4	100.6	101.4	101.1
livestock	87.8	95.1	80.0	82.4	89.7	91.2
cattle	81.4	90.9	69.9	74.9	84.1	84.4
pigs	101.5	110.3	96.4	102.8	117.2	125.3
sheep	98.7	102.7	97.0	88.4	89.8	92.3
poultry	100.3	101.0	108.6	116.4	125.6	132.5
29 Net value added at market prices	85.1	102.3	91.3	86.7	95.9	84.0
30 Net value added at basic prices	85.0	101.8	91.0	86.5	95.5	83.7

continued

Table 2: Aggregate Agricultural Accounts : Volume indices

United Kingdom (continued)

	2005=100					
	2007	2008	2009	2010	2011	2012
Compensation of employees	95.6	96.3	95.3	95.1	97.6	98.4
Entrepreneurial workers (farm and specialist contractors)	96.0	94.1	92.4	92.1	93.2	93.6

Note:

. . means no data available or not applicable