

EU Dairy Market Indicators

Background

AHDB has published market indicators for the UK dairy sector for a number of years to provide broad, general estimates of market returns. The value of those market indicators is predominantly as a basis for identifying trends. AHDB regularly reviews the calculations to ensure they remain relevant. The latest review, in 2018, concluded that, although there had been some movement in processing costs and milk quality, the differences were not material and the 2014 formulas should continue to be used.

For the UK, MCVE¹ (Milk for Cheese Value Equivalent) assesses returns from mild Cheddar, whey powder and whey butter. In order to understand how the UK is performing against a number of other main milk-producing nations of the EU, AHDB has developed unique MCVE calculations for each country. These indicators allow us to understand the key drivers behind farmgate price movements in those countries, as well as where the UK has a competitive advantage or disadvantage.

With the help of industry consultants², bespoke calculations of MCVE have been developed for France, Germany, the Netherlands, Ireland and Denmark, based on typical cheese production in those countries. This document explains the logic behind the calculations and where they differ from the UK's MCVE.

Approach

The EU MCVE formulas start with the UK MCVE and then adjust it for the following factors based on the country in question:

- Cheese type
- Cheese-making process (whether the milk is standardised or not)
- Compositional quality of the milk, and its impact on yields
- Market prices
- Overall costs
- Energy costs
- Labour costs

Details of how these factors differ for each country are given below.

¹ UK MCVE <https://dairy.ahdb.org.uk/market-information/milk-prices-contracts/market-indicators/ampe-mcve/>

² This report has been produced from information and calculations carried out by AHDB, along with assistance from Promar International and Cooney & Thake.

1. Cheese type

UK production is dominated by the production of hard cheese, in particular Cheddar, which makes up 70% of UK cheese production. Irish cheese production is similarly dominated by Cheddar.

In the other countries, Cheddar is not the most commonly produced cheese. In selecting the correct cheese type for each country, it was important to ensure that we were picking one that was equivalent to the mild Cheddar used in the UK MCVE calculation. That means a cheese that is commonly produced in the country, has a reliable and robust price reported on a monthly basis and can be produced in a process similar to mild Cheddar. This final point is important because production costs are based on the UK's mild Cheddar production costs, so using a cheese made by a completely different process would not be comparable.

For Germany, Denmark and the Netherlands, the main cheese production is defined as medium-hard cheeses, the most common of which is Gouda. In France there are many different cheeses produced without one particular type dominating production. However, when looking for a cheese equivalent to Cheddar, the closest is Emmental. Emmental accounts for over 75% of French production of cooked pressed cheeses. This category of cheese is the largest in the country, although still only representing 19% of total cheese make.

In summary, the following cheeses were selected:

Cheese	Country
Mild Cheddar	UK, Ireland
Gouda	Denmark, Germany, Netherlands
Emmental	France

The implications for a MCVE calculation are significant, with cheese compositional make-up impacting yields, market value and the actual cheese process itself.

Production of all three types of cheese result in whey and whey cream as by-products. The fat standardisation process (see section below) will also result in sweet cream as a by-product. Although numerous options are available for processors when it comes to use of the whey, we have continued to use whey powder and whey butter as the key by-products. This is partly because prices for other whey derivatives are not readily available. However,

it is also consistent with our main aim of returning a milk price achievable from the most basic of cheese processes, while remaining relevant.

2. Cheese process

The AHDB UK MCVE calculation assumes milk goes straight into the cheese vat without standardising. Although simplified, that is a reasonable assumption for the UK because, in general, UK cheesemakers do not fat-standardise the milk before it enters the cheese vats. The same is not true for the other main milk-producing countries of the EU, where fat standardisation is much more common. This is partly because the constituents of the cheeses produced are different from the mild Cheddar made in the UK. If, for example, UK cheesemakers were producing higher volumes of lower-fat cheeses, standardisation would likely be more common.

As part of the process to develop the equivalent EU MCVE calculations, AHDB looked at the financial implication of standardising in the UK. The conclusion is that the financial benefit from standardising is small. The main benefits are consistency of cheese and increased capacity from the cheese vats by removing some of the excess fat from the milk before it goes into the vat. Those benefits do not show up in our MCVE calculation, so the decision to use a standardised or non-standardised process is largely irrelevant for our MCVE prices. However, in order to remain representative of the countries involved, we are quoting non-standardised for the UK and standardised for all other EU countries.

After standardising, a cheesemaker will end up with a quantity of sweet cream as well as whey cream as a by-product. The former tends to have a higher value if sold as cream, or churned into butter, and this higher return is accounted for in the EU MCVE calculations. AHDB uses a £300 per tonne reduction for whey butter returns compared with quoted sweet butter prices.

Anyone interested in understanding the comparison of returns in the UK for standardised versus non-standardised can contact us at Dairy.MI@ahdb.org.uk.

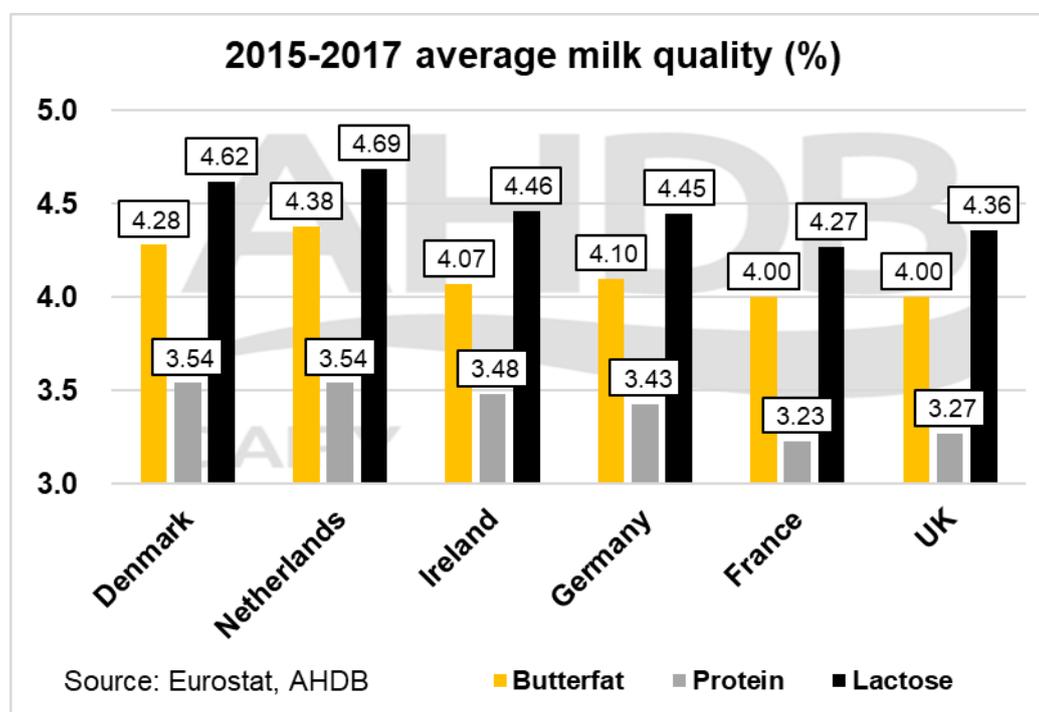
3. Compositional quality and yields

Yields are determined by a mass balance of fat, protein and other solids based on the average milk quality in the country and the typical composition of the cheese produced.

As previously reported³, compositional quality in the UK tends to be lower than the other main milk-producing nations of the EU, and this is reflected in the yields.

³ Previous report into UK v EU compositional quality: <https://dairy.ahdb.org.uk/news/news-articles/may-2018/uk-milk-solids-lag-behind-eu-competition/>

AHDB used a three-year average of butterfat and protein for each country, as reported by the EU commission, based on the years 2015 to 2017. We then estimated the average lactose level on the assumption that lactose would remain in similar proportions to the fat and protein for the country. The actual fat and protein figures are given in the chart below:



Based on these compositional quality results, yields were calculated for each country for the cheese produced and are given in the table below:

Yield (litres/t)	Denmark	Netherlands	Ireland	Germany	France	UK
Cheddar			8,900			9,300
Gouda	8,600	8,600		8,900		
Emmental					10,600	
Whey butter	214,000	208,000	373,000	223,000	226,000	218,000
Sweet butter	102,500	92,000		111,000	80,000	
Whey powder	16,000	16,000	16,500	16,500	17,000	17,000

One of the key drivers for the overall value of MCVE is the yield, and in particular how much cheese can be produced from the milk. The high level of protein in the milk in Ireland, for example, means 400 litres less milk is required to produce a tonne of mild Cheddar compared with the UK. At a cheese price of £3,000 per tonne, that is equivalent to more than 1.4ppl difference in cost.

4. Market prices

For UK MCVE we used the AHDB-quoted mild Cheddar price, which is based on spot-traded deals. Finding suitable equivalent prices for the other countries was not always possible. However, where available and regularly reported, we have used market prices for the country in question. Where such prices are not available, we have used the overall EU average as reported by the MMO.

The table below shows the source of the prices for each product:

Country	Cheese type	Cheese return price	Whey powder price	Butter price
UK	Cheddar	AHDB	EU MMO	AHDB.
Germany	Gouda	German MMO	German MMO	German MMO
Denmark	Gouda	EU MMO	EU MMO	EU MMO
Netherlands	Gouda	EU MMO	Dutch MMO	Dutch MMO
Ireland	Cheddar	EU MMO	Irish MMO	Irish MMO
France	Emmental	Polish MMO	EU MMO	EU MMO

Emmental is the interesting exception. For France we have chosen to use the Polish average price for Emmental. This is because there is a significant difference between the price for bulk Emmental and the price for rounds of Emmental. We believe the EU price includes a significant proportion of rounds that will be inflating the price. Given our costs are based on bulk product only, we have chosen to go with the Polish prices for lack of a suitable alternative. If a more relevant data series becomes available, we will look to switch across. If any readers know of a better price series, we would ask them to get in touch at Dairy.MI@ahdb.org.uk.

5. Overall costs

The EU MCVE values are calculated in euros and then converted into pence per litre (ppl) for the month in question (see exchange rate section below).

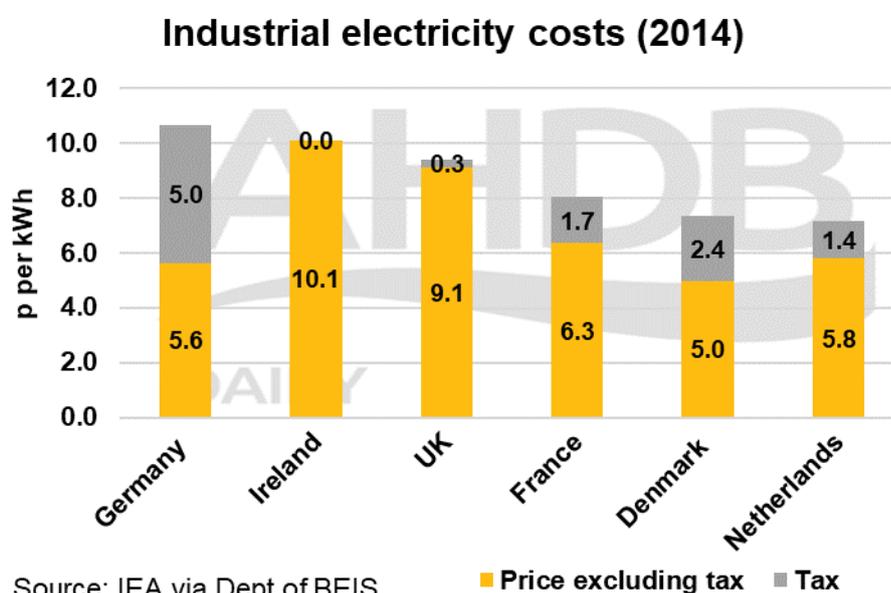
In order to set the processing cost base, we have taken the UK MCVE costs and converted them into euros using the average exchange rate in 2014. This is because the costs in the UK MCVE were set based on costs in 2014, so it is appropriate to assume those costs would have also held in Europe at whatever the exchange rate was at the time.

Once converted into euros, we then looked at how the EU countries compared with the UK for the key costs drivers of labour and energy costs. Details are given below:

6. Energy costs

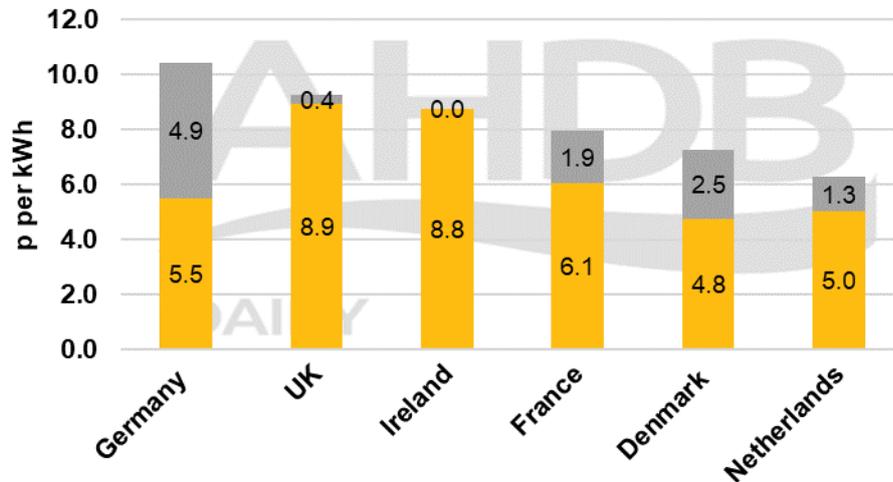
The basic assumption on energy costs is that, irrespective of where the factory is, it will still use the same amount of energy. The only difference in costs will therefore be the unit costs. We have assumed the main energy requirements will come from gas and electricity and have used a 50:50 split of costs between the two sources for cheese and butter production. For whey powder, a more appropriate split is 70:30 in favour of gas because of the need to dry the whey.

The charts below show the electricity and gas unit costs per kWh for 2014, splitting out the cost of tax for information purposes only.



The unit cost of electricity in the UK (before tax) is significantly higher than most other EU countries, other than Ireland. However, the relatively low tax rate in both of those countries brings the overall cost down below Germany. We have looked at more up-to-date costs to ensure that the relative position of each country has not moved significantly. The 2016 results are given below.

Industrial electricity costs (2016)

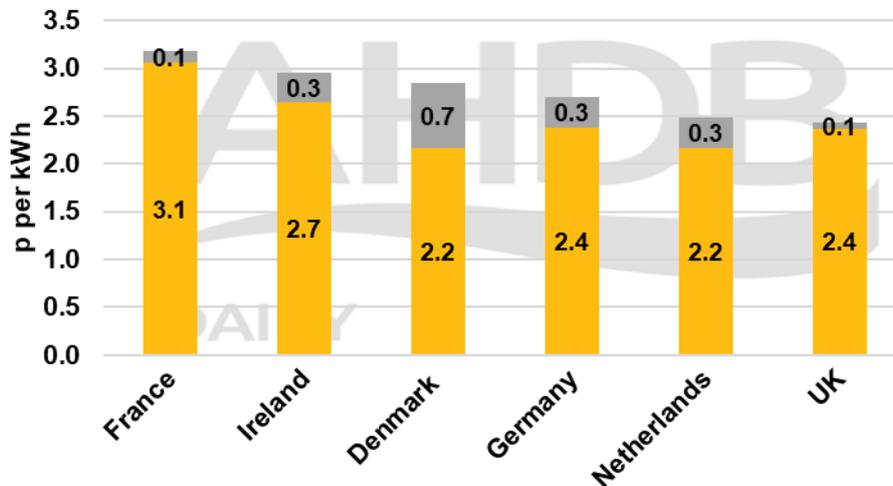


Source: IEA via Dept of BEIS

■ Price excluding tax ■ Tax

For gas, the UK fares much better, with the lowest overall cost of the six EU countries analysed in 2014. The costs are given below:

Industrial gas prices (2014)

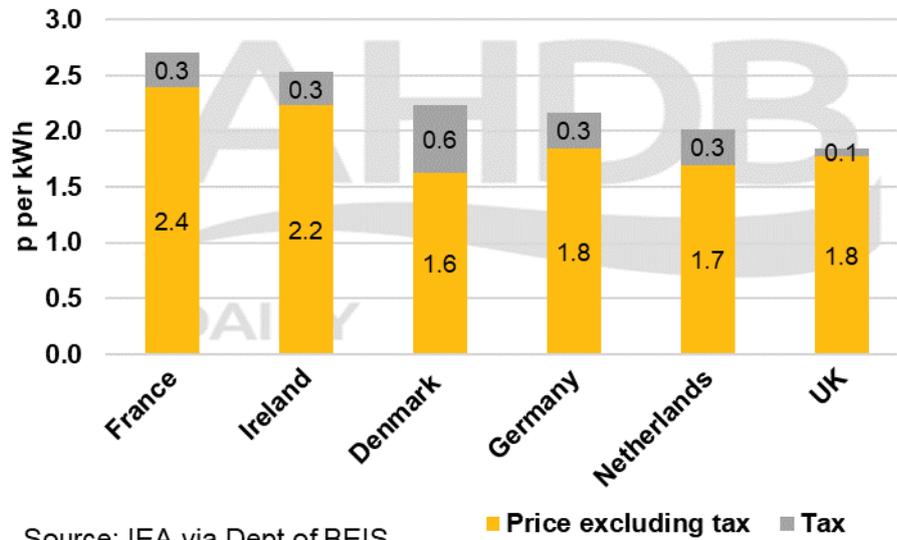


Source: IEA via Dept of BEIS

■ Price excluding tax ■ Tax

Similarly for 2016, the UK remains the lowest cost of the countries analysed.

Industrial gas prices (2016)

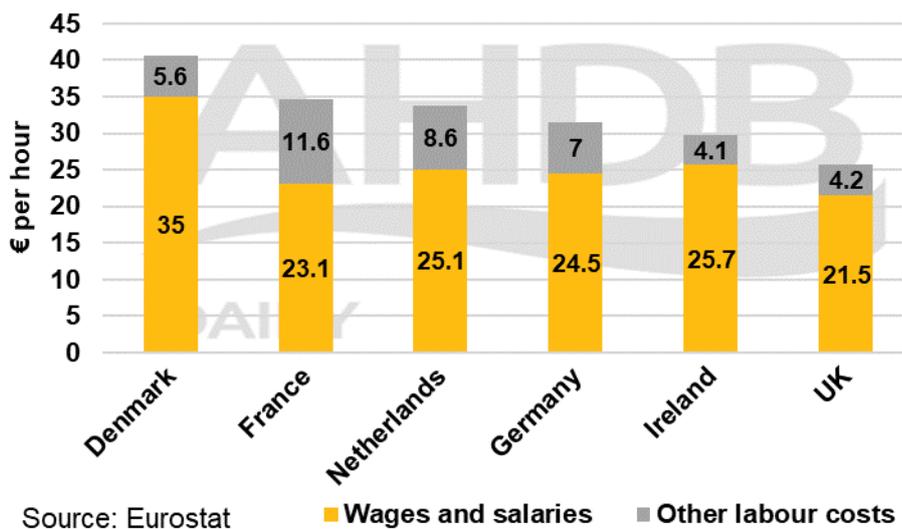


The gas and electricity unit costs have been compared with the UK and an adjustment made to the relevant costs in the MCVE calculation for each country.

7. Labour costs

As shown in the following chart, the UK had the lowest average labour cost of the countries under review in 2014. The cost for Denmark, for example, was 65% higher than the cost in the UK.

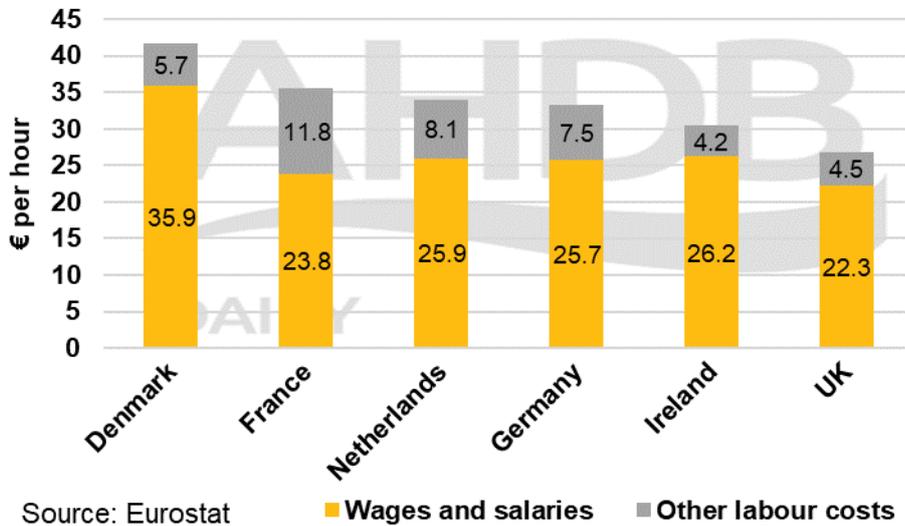
Labour costs (2014)



There is quite a wide variation in the overall structure for labour costs between the UK and the other countries. Ireland is the closest to the UK, whereas the likes of Denmark, France,

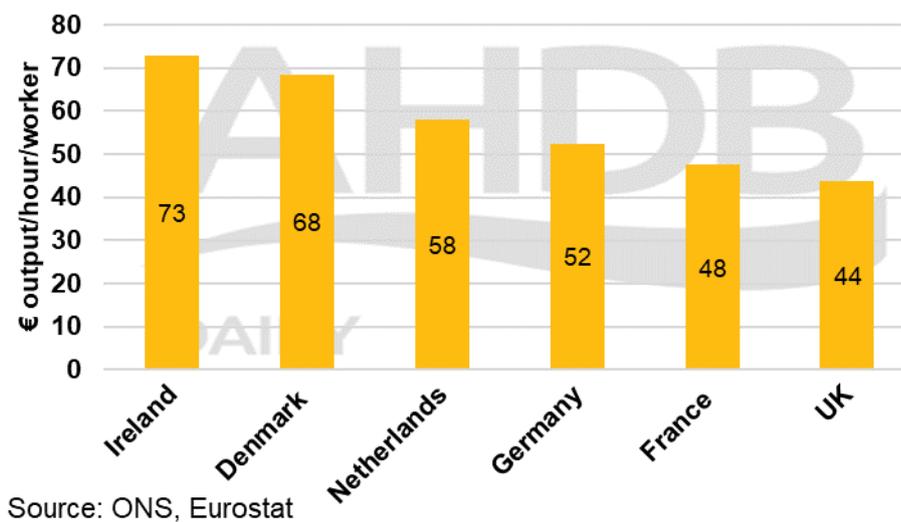
Germany and the Netherlands are all considerably higher. The relative labour costs in 2016 remained in line with the numbers seen for 2014.

Labour costs (2016)



While labour costs per hour are lower in the UK, it is also worth looking at labour productivity. Here the UK does not compare as well and sits at the bottom of the chart. In other words, while the UK pays less for its staff, it is achieving a lower level of productivity from them.

Labour productivity (2016)

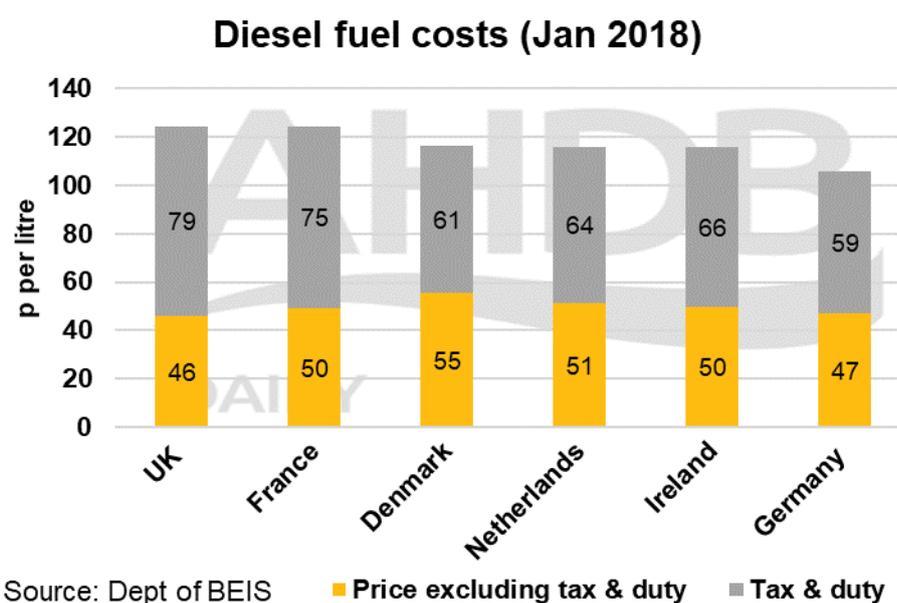


It is difficult to account for productivity in the MCVE calculation, mainly because the number of staff required is relatively low and taking a proportion of one member of staff would deliver nonsensical results. As a result, we have adjusted the labour costs in the MCVE

calculation to take into account unit costs but not productivity levels. This is something we may look into at a later date.

8. Other costs

The other costs used in the MCVE calculations have been assumed to be the same, irrespective of country. We did investigate the difference in diesel costs as part of the exercise and the results are given below for information only. The MCVE calculation is a factory-gate price and does not include the cost of milk collection or product delivery, and as such diesel costs are irrelevant.



These costs are, however, important when looking at farmgate prices, given their impact on milk haulage costs. The chart shows that the UK had the highest diesel costs in January 2018, mainly as a result of the high level of tax applied. The higher costs in the UK could lead to a bigger differential between factory-gate prices and the milk price paid to farmers, although that is beyond the scope of this document.

Summary

The EU MCVE values provide an indication on how the UK is performing against other EU countries when it comes to deriving value from milk. The costs and prices have been developed to allow for a comparison to be made between the countries and as an indication of why milk prices may be different between those countries. Any feedback on the indicators is welcome, especially suggestions on how wholesale cheese prices could be improved.