Outlook 2018

Economic Prospects for Agriculture

CONTRIBUTORS

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Summary Review of 2017

Global Economy
- Stronger global growth
- Brexit creates problems for EU
- Sterling depreciation
- Uncertainty a concern

Aggregate Agricultural Income
2017e vs 2016
- Up 31%

Margins (relative to 2016)
- Dairy - up significantly due to higher milk prices and volume
- Beef - up due to higher beef output and stable costs
- Sheep - up due to lower costs and higher direct payments
- Tillage - up due to higher yields and straw returns
- Pigs - up due to higher pig prices and lower costs

Average NFS Farm Income
2017e vs 2016
- Up 35%

Support Payments (relative to 2016)
- Total payments relatively unchanged

Input Costs
Quite stable. Reductions in fertiliser and feed partially offset by increases in fuel

Fertiliser Prices
Significant drops relative to 2016 level

Feed Prices
Steady in 2017 due to successive good global harvests

Oil Prices
Moved upwards as OPEC tried to tighten supplies, but prices still at moderate levels

Food Demand
Strong demand for dairy and meats, less so for grains

Eurozone inflation
remains very low

Irish Unemployment
fell below 7%

Weather conditions
a reasonable year for grass growth, but late season grazing and harvest problems in some areas
Summary of Prospects for 2018

Global Economy
- Positive economic outlook
- Weak sterling due to negative view on UK growth prospects
- Euro to strengthen against US dollar
- Continuing growth prospects in emerging economies

Aggregate Agricultural Income
- 2018f vs 2017e
- Down 8%

Average NFS Farm Income
- 2018f vs 2017e
- Down 6%

Margins in 2018 (relative to 2017)
- Dairy: Down due to lower milk prices
- Beef: Up due to higher prices
- Sheep: Down due to lower prices
- Tillage: Little changed
- Pigs: Down due to lower prices

Support Payments (relative to 2017)
- Total Payments relatively unchanged

Input Costs
- Slight upward pressure on some input prices

Fertiliser Prices
- Up on the 2017 level

Feed Prices
- Slightly higher towards end of 2018

Oil Prices
- Slight movement upwards, but still low compared to recent highs

Food Demand
- Mixed picture, with strong demand for dairy and less so for meats

Irish Unemployment
- To fall to 5%

Weather conditions
- Normal weather assumed

Eurozone inflation
- Remains very low
Overall Sector: Summary Review of 2017

<table>
<thead>
<tr>
<th></th>
<th>Output Value</th>
<th>Input Spend</th>
<th>Support Payments</th>
<th>Income</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Up</strong></td>
<td></td>
<td>Up</td>
<td></td>
<td>Up</td>
</tr>
</tbody>
</table>

- Weather conditions in 2017 were generally favourable to production. While grass growing and ground conditions were reasonable, but deteriorated in some areas in late season.
- Total production costs were little changed. Lower input prices were observed in 2017 for feed and fertiliser, while fuel prices increased. Higher volume usage was observed for both fertiliser and feed.
- Milk producers experienced a 30 per cent increase in output prices in 2017, with prices rising to 36 cent per litre. Irish milk production is estimated to have expanded by a further 8 percent in 2017.
- In 2017 higher milk prices, increased production and relatively stable input costs, led to the average dairy net margin rising by almost 120 percent to 15 cent per litre.
- Prices of finished cattle in 2017 increased by 1 percent. Prices of weanlings in Spring 2017 decreased by 4 percent while prices of store cattle in Autumn 2017 increased by 3 percent relative to the 2016 level.
- Taking account of the largely stable output prices and the relative stability of input costs, gross margins on the single suckling enterprise remained unchanged on the 2016 level.
- Gross margins on the cattle finishing enterprise increased by 8 percent in 2017.
- With both output volume and prices increasing per hectare, new payments from the Sheep Welfare Scheme and only moderate growth in costs, sheep farm margins are estimated to have grown by 20% in 2017.
- Irish cereal yields for major crops were up on the 2016 level. Cereal prices at harvest in Ireland were also up slightly on 2016 levels due to a slight decrease in global ending stocks forecast for the 2017/18 marketing year.
- Cereal direct costs fell slightly in 2017, due mainly to a decrease in fertiliser expenditure. As a consequence cereal margins increased in 2017 compared to 2016.
- Pig producers saw a strong improvement in pig prices of 10 percent in 2017.
- A slight decrease in pig feed prices was the basis for a slight decrease in pig production costs in 2017, leading to a significant improvement in margins from pig production.
Overall Sector: Outlook for 2018

- The outlook for 2018 for the Irish agriculture sector as a whole is conditioned by the assumption that normal weather prevails.
- With normal weather there should be little change in feed volumes in 2018 for all grassland enterprises, with the exception of dairy farms that are continuing to expand, where there may be some increase in feed use. Feed prices are forecast to rise slightly.
- Fertiliser prices may rise in 2018. Given that fertiliser sales volume increased considerably in 2017, no further increase is forecast in 2018.
- Pig producers should see a slight upward movement in feed costs in 2018.
- A slight rise in fuel prices is forecast in 2018, as oil price are likely to average higher than in 2017. Electricity prices are forecast to rise by 4 percent.
- Irish milk prices are likely to average about 10 percent lower in 2018 relative to 2017, as global supply growth is expected to outpace demand growth. Production costs should increase slightly.
- Irish beef prices are forecast to increase in 2018, due to strong EU demand and a reduction in supplies across the EU.
- Costs of production for beef are forecast to increase in 2018. But with prices rising, is projected, that margins will increase on both single suckling and cattle finishing enterprises.
- In 2018 with higher input costs and a decline in output prices, margins on sheep farms are forecast to decline from the level estimated for 2017. Payments from the Sheep Welfare scheme support sheep margins in 2018.
- Stock levels on international grain markets remain plentiful following successive strong global harvests, albeit with a slight decrease in stocks in 2017. Cereal prices at harvest in 2018 will be highly dependent on growing conditions globally.

On the assumption that global yields revert to normal, global supply and stock levels in 2018 are not forecast to increase over the 2017 level. Cereal prices are forecast to improve slightly relative to 2017.
- Overall costs on cereal farms look set to increase as farmers deal with increasing fuel and fertiliser prices. With yield forecasts mixed across crops, margins for most crops in 2018 will improve only very slightly on the 2017 levels.
- Pig meat prices are forecast to fall by 6 percent in 2018. Factoring in a slight rise in feed prices in 2018, a drop in margins is forecast.

Figure E3: Dairy and Beef Feed Use 2012 – 2018

Figure E4: Forecast Change in Output Prices 2018 vs 2017
Dairy: Review of 2017

- Irish milk prices rebounded in 2017, with prices rising right through the production season.
- As a result, the annual average national milk price for 2017 is estimated to have increased by 30 percent to an average of 35.9 cent per litre (CSO actual fat and protein).
- It is estimated that aggregate Irish milk production increased by 8 percent in 2017.
- Dairy cow numbers are estimated to have increased by 2.5 percent in 2017.
- On a per cow basis, dairy feed usage is estimated to have increased by 11 percent in 2017.
- Increased feed usage, combined with reduced feed prices, increased cow numbers and higher milk production, resulted in a 9 percent increase in dairy feed expenditure in 2017 on a per hectare basis, and a 4 percent increase on a per litre basis.
- Fertiliser use increased in 2017, in comparison with 2016 on foot of price reductions. This is estimated to have resulted in a 1 percent reduction in pasture and forage costs on a per hectare basis and a 1 percent reduction on a per litre basis.
- Total milk production costs are estimated to have increased in 2017 on a per hectare basis by 4 percent, with a 1 percent reduction recorded on a per litre basis (to 21.5 cent per litre). This was composed of a reduction in direct costs and an increase in overhead costs for the dairy enterprise.
- A relatively benign cost environment, coupled with a strong milk price and a substantial increase in milk production, resulted in an estimated net margin per litre of 15.5 cent per litre in 2017. This is reflective of an increase of over 100% year-on-year.
- With an assumed 5 percent increase in milk production per hectare, it is estimated that the net margin per hectare increased to a national average of €1,800.
Global dairy production is set to outpace consumption growth in 2018, with dairy commodity prices likely to weaken as a result.

It is forecast that the annual average milk price will fall by 10 percent in 2018 relative to the 2017 level, bringing the annual average milk price to 32.3 cent per litre (CSO actual fat and protein).

Assuming normal weather conditions in 2018, feed expenditure per head on dairy farms is expected to remain stable, given that it had already increased substantially in 2017.

Fertiliser prices are expected to rise by 5 percent in 2018. With sales having already increased substantially in 2017, a stable usage volume is forecast for 2018. Therefore overall expenditure of fertiliser will increase in 2018.

Fuel prices are forecast to rise by 2 percent.

Further growth in Irish national milk production is forecast in 2018. Following the estimated 8 percent increase in production in 2017, further growth of 4 percent is forecast in 2018.

With increased national milk production of 8 percent, total costs per hectare are forecast to increase by 6 percent, while costs on a per litre basis in 2018 are forecast to be more or less unchanged.

On a per litre basis, net margins are forecast to fall by 24 percent in 2018 relative to the 2017 levels, to an average of 11.8 cent per litre.

Farmers expanding production are assumed to benefit from some economies of scale. Based on a milk production volume increase of 4 percent, and a 10 percent fall in price, the forecast net margin per hectare in 2018 is €1,400, a decrease of 22 percent on the estimated 2017 level.
Cattle: Review of 2017

- In 2017 finished cattle prices increased by 1 percent relative to 2016. Lower prices for young cattle (calves and weanlings) in the Spring of 2017 were offset by higher prices for store cattle in the Autumn of 2017.
- Higher prices for prime cattle in 2017 have led to higher output value on Cattle Finishing enterprises.
- Stable prices for younger cattle in 2017 have led to no change in output value on Single Suckling enterprises.
- Falling Fertiliser prices have led to lower expenditure on pasture and forage, with other direct costs changing moderately compared to 2016.
- In 2017 the average gross margin per hectare earned on Single Suckling enterprises is estimated to have increased slightly to €438 per hectare.
- Cattle Finishing enterprise output value increased in 2017 and gross margin is estimated to be €592 per hectare in 2017, 8 percent up on the 2016 level.

Figure E11: Finished Cattle and Young Cattle Prices

Source: 2008-2016 DG Agri, CSO, 2017 Authors’ estimate

Figure E12: Costs of Production Single Suckling (SS)

Source: 2013-2016 Teagasc NFS, 2017 Author’s Estimate

Figure E13: Cost of Production Cattle Finishing (CF)

Source: 2013-2016 Teagasc NFS, 2017 Author’s Estimate

Figure E14: Output and Gross Margin

Source: 2013-2016 Teagasc NFS, 2017 Author’s Estimate
Cattle: Outlook for 2018

<table>
<thead>
<tr>
<th>Output Value</th>
<th>Input Spend</th>
<th>Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up</td>
<td>Up Slightly</td>
<td>Up</td>
</tr>
</tbody>
</table>

- EU supplies of beef are forecast to decline in 2018.
- Global beef markets are forecast to strengthen, with EU imports expected to rise in 2018.
- The UK remains Ireland’s most important beef market.
- The Brexit referendum result and depreciation of the pound sterling against the euro has created an immediate competitiveness challenge for the Irish beef industry.
- The forecast for Irish finished cattle prices is a 3 percent increase in prices in 2018 relative to the 2017 level.
- Young cattle prices are forecast to also increase, with prices 3 percent higher than in 2017.
- Input volumes on a per hectare basis in 2018 are forecast to increase moderately on the 2017 levels.
- Fertiliser, feed and other input prices are all forecast to increase.
- Direct costs of production on Single Suckling are forecast to increase by approximately 2 percent.
- Direct costs of production on Cattle Finishing enterprises are forecast to increase by approximately 4 percent.
- With higher output values, as a result of the forecast rise in cattle prices, and relatively minor changes in the direct costs of production, changes in margins on Single Suckling and Cattle Finishing enterprises in 2018 are forecast to be positive.
- In 2018 the gross margin per hectare on Single Suckling enterprises is forecast to increase by 4 percent to €455 per hectare.
- Higher young cattle prices moderate the impact of higher finished cattle prices. In 2018 the gross margin per hectare on Cattle Finishing enterprises is forecast to be 5 percent higher at €619 per hectare.
Sheep: Review of 2017

<table>
<thead>
<tr>
<th>Output Value</th>
<th>Input Spend</th>
<th>Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up strongly</td>
<td>Up modestly</td>
<td>Up strongly</td>
</tr>
</tbody>
</table>

- The growth in demand and supply of sheep meat in the EU in 2017 was largely balanced, lower imports and were reflected in moderate increases in EU lamb prices.
- European lamb market prices in 2017 were marginally higher than in 2016.
- 2017 lamb prices in Ireland are also estimated to have been higher than in 2016.
- Costs of production for Irish mid-season lowland lamb enterprises increased marginally in 2016 due mostly to increases in the volume of input used as most input prices declined.
- Gross margins per hectare for Irish mid-season lowland lamb producers are estimated to have increased strongly in 2017 due increases in output volume and higher prices. The receipt of Sheep Welfare Scheme direct payments also boosted margins.
- In the absence of the coupled payment received from the Sheep Welfare Scheme margins would only have increased by 10% over 2016.
- In 2017 gross margins on mid-season lowland enterprises are estimated to be €779 per hectare.

**Figure E18: Irish Sheep price with estimate for 2017**

Source: DG Agri 2002-2016; Authors’ Estimate for 2017

**Figure E19: Average Sheep production costs 2013-2015 and estimate for 2016**

Source: Teagasc NFS 2014-2016, Author’s Estimate for 2017

**Figure E20: Average Sheep output & margin estimate for 2016**

Source: Teagasc NFS 2014-2016, 2017 Author’s Estimate
Sheep: Outlook for 2018

- The outlook for Irish and EU lamb prices for 2018 is negative.
- Stable global supplies of mutton and lamb are forecast for 2018 with little growth in exports from Australia and New Zealand.
- Growing EU production and higher level of EU imports are forecast to leave EU and Irish lamb prices lower than in 2017.
- Sheep feed expenditure is forecast to increase.
- Fertiliser prices are also forecast to increase relative to 2017. With fertiliser usage unchanged, pasture and forage costs are expected to increase in 2018.
- With slightly higher costs of production in 2018 and lower output value, gross margins for mid-season lowland lamb enterprises in 2018 are expected to decline.
- The coupled Sheep Welfare Scheme payment in 2018 will moderate the decline in margins from mid-season lowland lamb production.
- In 2017 the average gross margin per hectare earned by Irish midseason lowland lamb enterprises is forecast to decrease to €731 per hectare.

Figure E21: 2017 Irish Sheep Meat Exports

Source: Eurostat COMEXT (Volume, year to end September)
Cereals: Review of 2017

- A slight decline in international cereal stock levels across the key growing regions of the world, led to a slight increase in cereal prices at harvest 2017. However, cereal prices remain at historically low levels.
- There was however an increase in yields of the main cereal crops in Ireland in 2017. For example, spring barley yields increased by 0.5 tonnes per hectare, while winter wheat yields increased by .9 tonnes per hectare, compared to 2016.
- Direct costs of production on Irish cereal farms decreased slightly in 2017 compared to 2016. Fertiliser related costs on cereal farms witnessed the largest per cent decrease, at 10 per cent and 5 per cent on winter and spring cereal crops respectively.
- Increases in other cost components, such as crop protection, meant that direct costs of production decreased by on average 3 per cent in 2017. Overall overhead costs increased slightly in 2017.
- The net effect of output value and input cost changes saw an increase in the gross margins on all cereal crops in 2017. The gross margin for winter wheat is estimated to be up by over €300 per hectare, while the margins for the other main crops, winter barley and spring barley, are estimated to be up approximately €200 per hectare.
- There remains a wide variation in terms of the economic performance of individual cereal farms nationally. It is estimated that the average cereal enterprise on specialist tillage farms will return a slight positive market based net margin in 2017. But behind this average figure is a range, with the bottom 1/3 of farms earning a negative market based net margin of - €275 to the top 1/3 of farms earning €600 per hectare.
- Overall, there was an increase in average market based net margin in 2017, relative to 2016, to approximately €50 per hectare. This can be attributed to slight increases in cereal prices, an increase in yields and straw returns, coupled with a slight decline in direct costs.

Figure E25: Gross Margin for Main Cereal Crops (2016 actual and 2017 estimate)

Source: Teagasc, National Farm Survey Data & Authors' estimate for 2017

Figure E26: Cereal Enterprise Net Margin on Specialist Tillage Farms (2016 Actual and 2017 estimate)

Source: Teagasc, National Farm Survey Data & Authors' estimates for 2017
Cereals: Outlook for 2018

<table>
<thead>
<tr>
<th>Output Value</th>
<th>Input Spend</th>
<th>Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up slightly</td>
<td>Up slightly</td>
<td>Up slightly</td>
</tr>
</tbody>
</table>

- World grain stocks decreased slightly in 2017.
- In terms of market supply and demand, there does not appear to be anything evident that would suggest that prices will move dramatically before harvest 2017.
- Current (November 2017) futures markets indicate that 2018 harvest prices will be about 7 per cent higher than 2017 harvest prices. This slight upward movement in prices can be explained by reversion to trend yields in 2018 and slightly lower ending stocks coming out of 2017 compared to the previous year.
- A return to trend yields in Ireland in 2017 would mean a mixed story in terms of yields achieved, with yields for some crops increasing and others decreasing.
- Direct costs of production on cereal farms are expected to increase slightly in 2018, with key inputs such as fertiliser, fuel and seed expected to increase.
- Movements in overhead cost items are also expected to cancel out some of the gains made in output value, with key fixed costs such as those related to fuel expected to increase.
- The net effect of the changes in output value and input expenditure is that 2018 gross margins for most cereals are forecast to increase only very slightly.
- The gross margins for spring barley are forecast to remain exactly the same as in 2017. Winter wheat gross margins are forecast to increase by less than €30 per hectare, and winter barley is forecast to increase by less than €70 per hectare in 2018.
- Cereal enterprise market based net margin on specialist tillage farms in 2018 is forecast to increase only very slightly on the 2017 level. It is forecast that the average specialist tillage will return a market based net margin of approximately €75 per hectare in 2018.
- It is forecast that approximately 50 per cent of specialist tillage farmers will return a negative market based net margin in 2018.

Figure E27: Gross Margin for Main Cereal Crops (2017 estimate & 2018 forecast)

Source: Teagasc, National Farm Survey Data & Authors’ estimate for 2017 & forecast for 2018

Figure E28: Cereal Enterprise Net Margin on Specialist Tillage Farms, 2018 forecast

Source: Teagasc, National Farm Survey Data & Authors’ forecast for 2018
Pigs: Review of 2017

<table>
<thead>
<tr>
<th>Output Value</th>
<th>Input Spend</th>
<th>Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up</td>
<td>Down</td>
<td>Up</td>
</tr>
</tbody>
</table>

- The prices of the main pig feed ingredients were stable in 2017.
- The annual average feed cost in 2017 was 104 c/kg dwt, which was 2 percent lower than 2016 and 10 percent lower than the 5 year average of 114 c/kg dwt.
- The global stocks of the principal composite pig feed ingredients increased during 2017 and the global stock to use ratio for wheat, maize and soyabean stand at 36 percent, 19 percent and 28 percent respectively.
- The 2017 Irish pig price was significantly higher than 2016 (162 vs 149 c/kg). However, during 2017 there were fluctuations, ranging from 153 to 172 c/kg.
- The estimated 2017 average pig price of 162 cent was marginally above the five year average (2013-2017) of 160 cent per kg.
- Higher prices in Q1-Q3 of 2017 were due to the continued strong exports to China. The price decrease in the last quarter was due to reduced export volumes and a higher EU pig supply.
- The 2017 ‘Margin Over Feed’ per kg was 58 cent, which was considerably higher than 2016 (43c/kg). It also exceeded the five and 10 year average of 46c/kg and 45c/kg respectively.
- The volume of Irish (IRL) pigs slaughtered increased to 3.72 million which was an increase of 90,000 on 2016 levels.
- The pig slaughter volumes in the principal European pig producing countries decreased by 1.3 percent when compared to 2016. The countries with the largest decreases were in Denmark (-5.4 percent) and France (-2.5 percent).
The bumper harvests in 2014, 2015 and 2016 have resulted in a significant build-up of global cereal and soybean stocks.

This is forecast to generate stable feed prices until mid-2018, where-upon harvest 2018 will dictate prices for the latter half of 2018.

Forecasts for the 2018 South American soybean harvest suggest it will be lower than 2017, but still the second highest on record at 107 million tonnes.

While this would suggest a fall in soybean prices in 2018, the increased supply may be offset by increased Chinese imports of 93 million tonnes.

The outlook for 2018 is for the annualised composite pig feed cost to either remain steady or increase only very moderately (€288-€298) when compared to 2017.

A stabilisation of the EU sow herd size and increased number of piglets born alive will increase the supply of European pigs. It is estimated that this increase will be in the region of 2 per cent.

The size of the Irish sow herd is expected to remain unchanged, but the volume of Irish pigs being slaughtered is expected to increase by 1.5 percent to 3.34 million.

This forecast increase in the volume of pigs on the European market will lead to higher volumes of pigmeat production in 2018. This will result in a forecast annualised price decrease of 6 per cent (to 152c/kg) in 2018.

The volume of Chinese pigmeat imports from the E.U. will have an important influence on the Irish pig price. It is expected that Chinese imports levels will remain high in 2018 but increased competition from the US and Canada and negative exchange rates could result in the volume being imported from the EU reducing.
Forestry Sector: Review of 2017

- Annual Irish afforestation figures have declined, with 5,008 ha planted by November 2017. The end of year figure is projected to be approximately 5,400 ha, which would be 17 percent below target levels.
- Both Coillte & private timber prices declined in the second half of 2016, with a level of recovery in sawlog and palletwood prices during 2017. There remains a wide variation in timber prices according to factors such as region, forest type, harvest type, timber quality and access.
- UK timber demand has remained buoyant during 2017.
- The area licensed for private thinning and clearfell up to the September, 2017 is 11.2 per cent lower than the equivalent area in 2016.
- The overall net demand for roundwood/wood fibre on the Island of Ireland was forecast to rise from 5.17 million cubic metres (m$^3$) in 2016 to 5.48 million m$^3$ in 2017, an increase of 6 per cent.
- In 2016, overall roundwood intake by sawmills increased by 5 percent over 2015 levels. An estimated 46 percent of the Irish market for sawn timber was supplied by domestic production. House completions increased by over 20 percent between 2016 and 2017.
- The timber sector remains very dependent on the export market, worth €380 million in 2016, a 7 percent increase over the 2015 value. A very high proportion (81 percent) of wood-based panels was exported (628,000 m$^3$) with a value of €206 million. Key export markets include the UK and the Benelux countries.
Forestry Sector: Outlook for of 2018

<table>
<thead>
<tr>
<th>Afforestation levels</th>
<th>Timber demand</th>
<th>Timber prices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up</td>
<td>Overall net demand increase</td>
<td>Dependent on Brexit scenario</td>
</tr>
</tbody>
</table>

- The annual afforestation target is 7,200 ha for 2018, an increase of almost 10 percent on 2017 target levels.
- Brexit-related uncertainties and currency fluctuations are forecast to continue to influence the market for Irish timber in 2018, but there is a level of confidence among timber processors regarding the continued buoyancy of UK timber markets, despite signals of a slowdown in construction growth.
- Other developments, including the proposed Renewable Heat Incentive and flexibilities included in the EU proposals for climate change mitigation may provide opportunities.
- 2,267 general felling licenses (GFLs) have been issued to the end of September 2017 representing an area of 27,966 ha, comprising both Coillte and private sector forestry. Under the 2014 Forestry Act felling licences may be issued for up to 10 year duration, and not all felling will occur in the year that the licences are issued. It is anticipated that a higher proportion of thinning will occur in 2018.
- The overall net demand for roundwood/wood fibre on the Island of Ireland is forecast to rise from 5.17 million cubic metres (m$^3$) in 2017 to 5.80 million m$^3$ by 2018, an increase of 6 per cent.
- Forecasts indicate that the net realisable volume from the private sector will increase slightly from 915,000 m$^3$ in 2017 to 927,000 in 2018 m$^3$. Private sector volume production is predicted to increase steadily, reaching 1.32 million m$^3$ in 2020 and 3.21 million m$^3$ by 2026.
- House completions are forecast at 20,000 in 2018. Based on trends in household formation, there is likely to be an increase in demand for housing from the current level of 23,000 units per annum to just over 30,000 per annum in 2024.
<table>
<thead>
<tr>
<th>Category</th>
<th>2016 Data</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irish Milk Deliveries</td>
<td>6,651 million litres (up 4%)</td>
<td></td>
</tr>
<tr>
<td>Days at Grass</td>
<td>235 days (down 2%)</td>
<td></td>
</tr>
<tr>
<td>Milk Production per cow</td>
<td>average 5,316 litres (down 1%)</td>
<td></td>
</tr>
<tr>
<td>Stocking Rate</td>
<td>average of 2.07 lu/ha</td>
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<tr>
<td>Milk price (Teagasc NFS)</td>
<td>average 28 cent per litre (down 10%)</td>
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</tr>
<tr>
<td>Milk Production per ha</td>
<td>average 11,087 litres (up 3%)</td>
<td></td>
</tr>
<tr>
<td>Irish Dairy Cow Numbers (Dec)</td>
<td>1.295 million (up 5%)</td>
<td></td>
</tr>
<tr>
<td>Milk Fat Content (CSO)</td>
<td>average 4.10% (up 6 basis points)</td>
<td></td>
</tr>
<tr>
<td>Milk Protein Content (CSO)</td>
<td>average 3.45% (down 2 basis points)</td>
<td></td>
</tr>
<tr>
<td>Concentrate Fed/Dairy Cow</td>
<td>average 935 kg (up 3%)</td>
<td></td>
</tr>
<tr>
<td>Milk Solids per Cow</td>
<td>average 414 kg (up 5%)</td>
<td></td>
</tr>
<tr>
<td>Concentrates fed/litre of milk</td>
<td>average 0.18 kg (up 13%)</td>
<td></td>
</tr>
<tr>
<td>Nitrogen per ha of grassland</td>
<td>average 168 kg</td>
<td></td>
</tr>
<tr>
<td>Single Farm Payment per farm</td>
<td>€ 19,735</td>
<td></td>
</tr>
<tr>
<td>Total Production Costs</td>
<td>aug. 21.7 cent per litre (down 3%)</td>
<td></td>
</tr>
<tr>
<td>Somatic Cell Count</td>
<td>average 168,000 cells/ml (down 7%)</td>
<td></td>
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<tr>
<td>aug. €2,409 per hectare (up 1%)</td>
<td></td>
<td></td>
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<tr>
<td>Gross Margin for Dairy Enterprise</td>
<td>aug. 16.01 cent per litre (down 18%)</td>
<td></td>
</tr>
<tr>
<td>aug. €1,775 per hectare (down 16%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net Margin for Dairy Enterprise</td>
<td>aug. 6.7 cent per litre (down 32%)</td>
<td></td>
</tr>
<tr>
<td>aug. €792 per hectare (down 27%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Teagasc National Farm Survey and Central Statistics Office
### Irish Dairy Farming in 2017

- **Dramatic recovery in milk prices and further expansion in Irish milk production**
- **Milk Production** up 8% on the 2016 level
- **Milk price** up 30% on the 2016 level
- **Weather Conditions** generally favourable but challenging conditions in some areas
- **Grass Availability** generally good
- **Fertiliser Prices** down 6%
- **Fertiliser Use** up on 2016 level
- **Feed Prices** down 2%
- **Feed use** up 11% per head
- **Other Direct Costs** down 1% on the 2016 level
- **Fuel prices** up 8% on the 2016 level
- **Total Costs per litre of milk** up 4% on the 2016 level
- **Net Margin for Dairy Enterprise** more than doubled in 2017

### Irish Dairy Farming in 2018

- **Fall in milk prices supply surplus globally conditions with further dairy expansion**
- **Milk Production** up 4% on the 2017 level
- **Milk price** down 10% on the 2017 level
- **Weather Conditions** Normal weather assumed
- **Grass Availability** generally good
- **Fertiliser Prices** up 5%
- **Fertiliser Use** little change
- **Feed Prices** up 2%
- **Feed use** up 1% per head
- **Other Direct Costs** up 1% on the 2017 level
- **Fuel prices** up 3% on the 2017 level
- **Total Costs per litre of milk** unchanged on the 2017 level
- **Net Margin for Dairy Enterprise** down 24% per litre on 2017 high

*Source: Teagasc Estimates for 2017 and Forecasts for 2018*
1. Introduction

2016 was a challenging year on dairy farms with milk prices continuing to fall. Overall, a 10% reduction in price was experienced year-on-year. As a result, Family Farm Income (FFI) on dairy farms declined by 16% to €52,154 according to the Teagasc National Farm Survey (Teagasc NFS). In spite of this, the value of milk sales was down just 7% on average, due to a 4% increase in milk production. Therefore, as was the case in 2015, production growth limited the reduction that took place in dairy farm income on average in 2016.

Despite falling prices, global milk production growth outpaced consumption in early 2016 adding to already accumulated stocks with milk prices reaching a low point mid-year. To help alleviate the market imbalance, the EU introduced a voluntary supply control measure which was beneficial and substantial purchasing of SMP for intervention took place.

In turn 2017 has been a very positive year for the Irish dairy sector with a dramatic recovery in the milk price leading to an increase in national production of 8%. Weather conditions have been generally favourable though the first three quarters of the year although poor ground conditions in some areas may have led to difficult grazing conditions and earlier housing this winter, which may pose some difficulties around the availability of fodder.

This paper looks back on dairy farm performance in 2016, reviews the outcomes for 2017 and looks ahead to the prospects for 2018. Data from the Teagasc NFS are used in our review of 2016. The milk price and key input cost estimates for 2017 are used to produce an overall estimate of dairy enterprise margins for 2017. Finally, in the concluding sections of the paper, the forecast for milk price, production costs and dairy farm margins in 2018 are presented.


National Farm Survey results for 2016 were finalised in July 2017, and the results for dairy farms are summarised here. To examine the economic performance of dairy farms in 2016, we first look at how dairy farm income has changed over the last number of years. Figure 1 presents the average Family Farm Income (FFI) on Specialist Dairy farms over the years 2006 to 2016.

Average FFI on Irish dairy farms fell from 2014 to 2016 due to the depressed milk price, despite increased milk production post-quota abolition. Despite this, it is clear from Figure 1 below that income levels on average in recent years have been substantially higher than in the years prior to the peak in 2011 where there was much volatility.

To further explore the economic performance of dairy farms in 2016, we next look at how margins have changed in the past few years. Table A1 (see appendix) presents the average gross output, gross margin and net margin per litre of milk produced in 2015 and 2016. Farms producing mainly liquid milk are excluded from the sample, as are herds of 10 cows or less.

Figure 1: Average Income on Irish Specialist Dairy Farms 2006 to 2016

Source: Teagasc National Farm Survey (various years)
The gross output measure includes the value of milk and calf sales minus replacement costs. The data indicates that gross output per litre decreased by 12 percent in 2016 relative to 2015, mainly due to the lower milk price. The equivalent figure for 2015 relative to 2014 was -17 percent. Total direct costs also fell in 2016, by 2 percent compared to 2015, due mainly to lower fertiliser and feed costs. In addition fixed costs per litre fell by 4 percent year-on-year. As the cost savings experienced were not large enough to counteract the reduction in output value overall, the average gross margin in 2016 decreased by 18 percent on a cent per litre basis relative to 2015. The average net margin in 2016 was 6.72 cent per litre, representing a 32 percent decrease on the 2015 level.

Table A2 (in the appendix) presents gross output, total costs and net margin per hectare of forage area allocated to the dairy enterprise for 2015 and 2016. Production per hectare increased by 3 percent in 2016, but overall net margin per hectare decreased by 27 percent, largely due to the fall in milk price.

The cost and margin data in Table A3 allow us to examine the variability in economic performance across dairy farms in 2016. Farms are classified on the basis of gross margin per hectare: the best performing one-third of farms (Top), the middle one-third (Middle) and the least well performing one-third (Bottom). On a per litre basis, production costs for the Bottom group (23.99 cent) are 19 percent higher than for the Top group (20.17 cent) and the net margin for the Bottom group (3.37 cent) is only one-third of that of the Top group (9.93 cent). This indicates a widening in the profitability differential between the Top and Bottom groups compared to 2015 when the Bottom group were achieving a net margin half that of the Top group.

Figure 2 indicates that total milk production costs declined in both 2015 and 2016. The main drivers of this decline were reduced expenditure on pasture and forage, the fixed cost dilution effect associated with producing more milk and also an accounting adjustment which reduced the allocation of the overall fixed costs of the dairy farm to the dairy enterprise in 2016. Total production costs per litre fell below 22 cent in 2016 the lowest since 2007, almost 6 cents lower than at the peak reached in 2013.

### 3. Review of 2017 Estimated Performance

This section of the paper presents a review of dairying in 2017. Teagasc NFS results for 2017 will not be available until the middle of 2018. Therefore, it is necessary to estimate the price and volume of inputs and outputs in 2017, in order to assess the outcome for margins. The following section of the paper first discusses cost estimates for 2017, looking at both input prices and input usage volumes. Finally, the development of dairy product markets in 2017, in terms of both price and volume changes, is discussed.

The discussion of production costs in 2017 is complicated by the fact that milk production at the overall national level has continued to increase significantly in 2017. In spite of the growth in milk production in previous years, it is only in 2017 that we have finally begun to observe a noticeable increase in input utilisation on dairy farms. The situation on individual farms may not mirror this overall national picture. This analysis cannot attempt to cover the experience on every farm in 2017.

#### 3.1 Estimated Input Usage and Price 2017

It is not possible to offer a comprehensive assessment of likely changes in costs at the farm level in 2017, given that the post milk quota expansion strategy of the farm will itself influence the change in production costs, whether expressed on a per hectare or on a per litre basis. In this analysis of likely changes in production costs in
2017, it is assumed that the average farm increases its milk production by 8 percent in 2017.

3.1.1 Feedstuff – usage and price 2017

Purchased feed (concentrates) is an important element of dairy production costs in Ireland, typically accounting for about 20 percent of total production costs, although this varies by farm and by year.

While official aggregate feed sales data for the full year are not yet available, provisional data suggest that dairy feed sales increased strongly in 2017. Given that the Irish dairy cow population is estimated to have increased by 2.5 percent in 2017, this suggests that there has been a substantial increase in feed use per dairy cow in 2017 of over 11 percent. Weather conditions have been generally favourable through the first three quarters of 2017, but poor ground conditions in some areas may have led to difficult grazing conditions and earlier housing this winter. The average milk yield per cow is estimated to have increased by 5 percent in 2017 relative to 2016.

Figure 3 shows the average volume of compound feed use per cow, including an estimate for 2017. These data are derived from Department of Agriculture, Food and Marine (DAFM) figures on feed sales, from Central Statistics Office (CSO) data on animal numbers and estimates by the authors.

Figure 3: Compound Feed Purchases per Dairy Cow in Ireland: National Average for 2010 to 2017

Source: Author estimates derived from DAFM and CSO data
Note: e = estimate

For the average dairy farm, expanding production by 8 percent in 2017, feed use per cow, is estimated to be 983kg, 11 percent higher in volume terms than in 2016. It should be kept in mind that the feed usage on individual farms may differ from this average story.

Weather conditions globally for cereal and other grain producers have been quite good in each of the last five years. Good harvests in these years have led to a rebuilding of global cereal stocks and generally lower international cereal prices. Internationally, conditions were again quite good in 2017, further contributing to the recovery in stock levels. Accordingly, price on the Irish feed market dipped slightly in 2017.

Figure 4 shows an index of monthly Irish cattle feed prices from 2009 to 2017. The annual average feed price for 2017 is estimated to be €270 per tonne, representing a 2% drop in the 2016 level. The slight drop in feed prices in 2017, combined with a significant increase in volume for dairy aggregate dairy feed use, suggests that total expenditure on dairy feed in 2017 rose in aggregate terms. However, in assessing feed use per litre, allowance must be made for the rise in feed use per head. On a per litre basis the expenditure on feed is estimated to have increased by 4 percent in 2017. Alternatively, feed costs on a per hectare basis are estimated to have increased by 8 percent on the average farm producing 8 percent more milk in 2017, assuming an increase in forage area of about 3 percent.

Figure 4: Monthly Price Index of Cattle Meal in Ireland 2009 to 2017

Source: Central Statistics Office (Various Years)

3.1.2 Fertiliser – usage and price 2017

Pasture and forage costs typically comprise about 20 percent of total production costs on dairy farms. Fertiliser purchases comprise about half of the pasture and forage cost element, with contractor costs accounting for most of the remainder. Figure 5 charts the Irish monthly index of farm level fertiliser prices from 2007 through to 2017.
There was a significant decline in fertiliser prices in 2017. This reflected the decline in production costs internationally associated with lower energy prices and excess production capacity. Gas is by far the largest cost component of nitrogen based fertilisers. Irish fertiliser prices for 2017 as a whole were about 6 percent lower than in 2016.

In 2017 nitrogen fertiliser sales nationally jumped by almost 10 percent. DAFM sales figures for 2017 as reported in Figure 6 indicate a 10 percent increase in nitrogen (N) and a 12 percent increase in both phosphorus (P) and potassium (K) sales in 2017 relative to the 2016 level.

Contractor costs comprise the remaining 50 percent of the pasture and forage cost element. While no official figures are available, it is assumed that there has been no change in contractor charges in 2017.

With fertiliser expenditure estimated to have increased in 2017 relative to 2016 and expenditure on contracting estimated to be unchanged, pasture and forage expenditure is estimated to have increased on a per hectare basis in 2017 by about 2 percent. Expenditure on pasture and forage has fallen on a per litre basis by 1 percent on farms where milk production has increased by the national average of 8 percent.

Overall, taking account of the increase in the level of fertiliser sales and the decline in price, fertiliser expenditure per hectare on the average dairy farm in 2017 is estimated to have increased by 6 percent compared with the 2016 level. Given the increase in milk production, it is estimated that expenditure on fertiliser per litre of milk actually fell slightly by 2 percent.

Crude Oil and Motor Fuel Prices: Global oil supplies continue to be plentiful but production has been more closely aligned with consumption in 2017 than in 2016. OPEC, Russia and some other non-OPEC producers have continued their efforts to curb production. OPEC currently has a supply control agreement in place which will last until March 2018 and at the time of writing it was unclear whether this could possibly be extended out further. Following a dip in prices mid-year to US$45 per barrel (pb), Brent oil prices have recovered to the $60 mark by the end of 2017.

Crude oil prices are presented in Figure 7. The average annual price for 2017 will be about US $54 pb, which represents an increase of 22 percent on the average oil price in 2016 (US $44 pb).

For 2017 as a whole there was a slight increase in the value of the euro against the US$, which moderated the increase in oil prices very slightly in euro terms.
On an annual average basis, the euro was worth US $1.13 in 2017, up about 2 cent on its average level for 2016. Hence, the estimated average crude oil price for 2017 was over €48 pb, an increase in euro terms of about 20 percent on the 2016 value of €40 pb. Overall, farm level fuel costs in Ireland experienced an increase in 2017, with fuel prices approximately 8 percent higher in 2017 relative to the 2016 level.

Electricity Prices: Electricity costs change infrequently in Ireland due to price regulation. Monthly prices have been unchanged through 2017, but this represents a 2 percent decrease for 2017 as a whole in comparison with 2016.

Fuel and Electricity Volumes: Demand by farmers for fuel and electricity tends to be relatively inelastic with respect to price. It is difficult to determine to what extent increased milk production has had an impact on energy and fuel requirements.

Given that milk production is estimated to have increased nationally by 8 percent, this suggests that energy and fuel expenditure per litre of milk produced will not have increased by as much as the farm level increase. For the average dairy farm, the overall expenditure on both electricity and fuel is estimated to be unchanged on a per litre basis and up by 5 percent on a per hectare basis in 2017.

3.1.6 Other Direct and Fixed Costs—usage and price 2017

It is estimated that there was a 1 percent increase in agricultural wages in Ireland in 2017. It is assumed that the quantity of hired labour used on farms is likely to have increased slightly to cater for increased milk production. Additional hours may have been required on farms that have expanded milk production, but this is dependent on decisions made at farm level about the mix of own labour and hired labour to be used.

In contrast to recent years, there was actually a 1 percent fall in other input cost items in 2017. It is assumed that usage volume of these input items is unchanged.

The assessment of fixed costs in the Teagasc National Farm Survey is quite complex and definitive information on how fixed costs have changed in 2017 will not be available until the National Farm Survey results for 2017 become available in the middle of 2018. At the overall farm level, it is estimated that fixed costs on dairy farms have not changed in 2017. However, due to the strong recovery in milk price in 2017 and the further increase in milk production, the share of fixed costs allocated to the dairy enterprise on dairy farms is estimated to have increased by 5 percent on a per hectare basis.

3.1.7 Estimate of Total Input expenditure for 2017

Many dairy farms in Ireland have continued to expand milk production in 2017. The possibility to produce more milk has allowed dairy farmers to exploit productivity improvements and spread fixed costs across a larger output volume. This will have an impact on the cost of production on both a per litre and per hectare basis. Increasingly, the assessment of costs on a per hectare basis will become the most relevant measure, but costs are also assessed here on a per litre basis, since it provides a useful comparator with previous years.

A comprehensive assessment of the impact of increased milk production on production costs is not possible given the heterogeneity of farms and their differing expansion strategies. Here it is assumed that the average farm has expanded its milk production by 8 percent in 2017.

Figure 8 charts the average total cost of production and its subcomponents for selected years from 2010 to 2016 and the associated estimate for 2017.
3.2 Review of Dairy Market in 2017

Following a poor year for farm milk prices in 2016, there was a strong rebound in milk prices in 2017, led by an unprecedented rally in butter prices. Growth in global dairy production slowed in 2016, but there has been a recovery in the pace of production growth in 2017.

In the 2016 calendar year New Zealand milk production fell by 1.7 percent. Production began to recover towards the end of the 2016/2017 season as milk prices began to improve. Production growth in the current 2017/18 season has been patchy, with August and September blighted by unfavourable weather. However, the October 2017 production estimates showed a 2.7 percent rise in deliveries on the same month in 2016. For calendar year 2017 NZ milk production is likely to be up by close to 1.5 percent or 0.3 Mt. Overall, this means that production in 2017 is almost back on a par with the 2015 level.

EU milk production almost stagnated in 2016, with growth of just 0.4 percent recorded. The improvement in prices has facilitated stronger production growth in 2017, which is likely to show an increase of about 1 percent or 1.7 Mt on the 2016 level.

The overall EU production story masks quite a degree of variability at the MS level. Among the main milk producers production has continued to increase, but there are some exceptions. Figures to the end of September 2017 show production up in Ireland (8.2 percent), Poland (4.6 percent), Italy (2.8 percent) and Denmark (2.7 percent). However, production in the year to September 2017 has fallen in France (-1.9 percent) and Germany (-1.8 percent). Notably production in 2017 in the Netherlands has also fallen (-0.7 percent) as the sector there grapples with new environmental constraints on phosphate levels. Production in 2017 in the UK is more or less in line with the 2016 level.

Milk production growth in the US has continued to grow steadily in 2017 and for the full year should be in the region of about 1.6 percent or 1.5 Mt up on the 2016 level.

In 2016 global milk production grew by just 0.9 percent, (IDF, 2017).—but higher commodity and farm milk prices have led to stronger production growth for 2017. Global milk production may have increased to 850 million tonnes (mt) in 2017, compared with 838 mt in 2016. This annual rate of increase of 1.4 percent is still below the trend of the last fifteen years, which averaged close to 2.3 percent per annum.

On the demand side the Russian market remained closed to EU exports in 2017. Milk powder demand from China in 2017 has been stronger than in 2016. For the period January to September 2016 Chinese imports of SMP from the EU were over 70 percent above the same period in 2016. Chinese imports of WMP from the EU have also increased by close to 30 percent in January to September 2017 relative to the same period in 2016.

Figure 9 shows price movements in the influential New Zealand Global Dairy Trade (GDT) Auction Index. The auction price stabilised in Q3 2017 suggesting that the market was approaching a more balanced position. In Q4 the auction has begun to return a fairly consistent pattern of negative results, and the cumulative effect seems to mark the beginnings of a downward trend in prices.

Figure 8: Total Costs of Milk Production in Ireland for selected years and estimate for 2017

Source: Teagasc National Farm Survey Data and Authors’ estimate
Note: e = estimate

It is estimated that the average total cost of milk production in Ireland in 2017 was 21.5 cent per litre compared to an average of 21.7 cent per litre in 2016. The total cost figure for 2017 reflects a combination of lower direct input prices, but also an increase in the share of farm level fixed costs borne by the dairy enterprise.
The amazing rise in European butter prices has been the standout feature of the global dairy market in 2017. Butter prices reached an unprecedented €6,500 per tonne in September, representing a doubling in price over a 12 month period.

By contrast SMP prices have fallen to below intervention levels and the market is reported to be extremely weak in Q4 2017. The 360,000t of EU SMP intervention stocks continue to overhang the market, with considerable uncertainty as to how and when the Commission might manage to begin its release or disposal.

European wholesale dairy product prices are shown in Figure 10. The weak market situation for SMP is evident in the low level of prices through much of 2017. The strength of butter prices is particularly noticeable.

In 2017 milk production continued to increase in Ireland, aided by much improved milk prices and moderate production costs. The dairy cow herd continued to grow and yields had jumped considerably on the back of higher feed usage.

Figure 11 shows monthly Irish milk deliveries in 2017. In H1 of 2017 production showed a further increase relative to the same period in 2016 and this strong trend has continued in H2.

For 2017 as a whole milk production is likely to be about 8 percent up on the 2016 level. Irish dairy cow numbers, as recorded in June 2017 increased to 1.432 million, compared with 1.397 million in 2016, an increase of 2.5 percent (CSO 2017). This means that the increase in Irish dairy cow numbers since 2010 is almost 33 percent.

Figure 12 presents monthly Irish milk prices recorded by the CSO from January 2008 through to September of 2017. In Ireland the 2017 manufacturing milk price is estimated to have increased by about 30 percent relative to the 2016 level on an actual constituents basis.

**3.3 Estimated Output Values 2017**

In 2017 milk production continued to increase in Ireland, aided by much improved milk prices and moderate production costs. The dairy cow herd continued to grow and yields had jumped considerably on the back of higher feed usage.

Figure 11 shows monthly Irish milk deliveries in 2017. In H1 of 2017 production showed a further increase relative to the same period in 2016 and this strong trend has continued in H2.

For 2017 as a whole milk production is likely to be about 8 percent up on the 2016 level. Irish dairy cow numbers, as recorded in June 2017 increased to 1.432 million, compared with 1.397 million in 2016, an increase of 2.5 percent (CSO 2017). This means that the increase in Irish dairy cow numbers since 2010 is almost 33 percent.

Figure 12 presents monthly Irish milk prices recorded by the CSO from January 2008 through to September of 2017. In Ireland the 2017 manufacturing milk price is estimated to have increased by about 30 percent relative to the 2016 level on an actual constituents basis.

**Figure 12: Irish Farm Gate Milk Prices Actual fat (vat incl.) Jan 2008 – Sept 2017**

Note: Actual fat (VAT inclusive)
Some farmers will have milk in fixed price contracts and therefore may not obtain the spot prices quoted in this paper.

The annual average national milk price (CSO definition) is estimated to be close to 36 cent per litre (vat inclusive) in 2017 on an actual fat and protein basis (estimated to be 4.08 percent fat and 3.49 percent protein).

The flip side of the buoyant state of the butter market, is a considerable build-up of both EU public and private SMP stocks. EU intervention stocks are shown in Figure 13. By September 2017 EU intervention SMP stocks stood at almost 360,000 t or 3.5 million tonnes in milk equivalent terms.

**Figure 13: EU SMP Intervention Stocks 2016&2017**

Source: Milk Market Observatory

In addition to the growth in milk production volumes, there has been an impressive increase in both fat and protein levels in Irish milk deliveries in the last four years as illustrated in Figure 14. The average fat content of Irish milk deliveries in 2017 is close to 4.1 percent. Following a drop in 2016 protein levels have improved in 2017 to 3.49 percent.

**Figure 14: Butterfat in Irish Milk Deliveries 2013 and 2017**

Source: CSO

### 3.4 Review of Dairy Enterprise Net Margins in 2017

The review of milk prices showed that the average milk price for 2017 was up 30 percent on the 2016 level. The review of input costs concluded that for the average farm, having expanded its milk production by 8 percent, total production costs on a per litre basis are estimated to have increased by 3 percent in 2017 relative to 2016.

It is not possible to provide a farm specific indication of the change in margin per litre (or per hectare) in 2017, given that individual farms will have expanded production to differing extents and will have faced differing marginal costs for the additional milk produced. These uncertainties feed into the calculation of the average margin per litre (hectare) that was achieved in 2017.

Margin per hectare is described before examining the margin on a per litre basis. Figure 15 presents the estimated average gross output, production costs and net margin per hectare for 2017 in comparison to recent years on the basis of an 8 percent increase in milk production in 2017.

In estimating the margin per hectare, changes in the price of milk and in the price of input items tells only part of the story. The increase in milk production continues to have an impact on the output, costs and margin per hectare that was achieved. Here we assume that the increase in production has taken place alongside a 3 percent increase in the land base of the average farm’s dairy enterprise.

**Figure 15: Average Gross Output, Costs & Margins per hectare for Irish Milk Production in 2013-2016 & estimate for 2017**

Source: Teagasc National Farm Survey Data and Author estimates

Note: e = estimate
For 2017 the net margin for milk production averaged €1,800 per hectare. This makes 2017 the highest net margin year on record. Relative to 2016, the increase in margin per hectare in 2017 is estimated to have been 142 percent. A smaller increase in margin per hectare will have been recorded on farms with a more modest increase in milk deliveries.

Estimated average net margin per litre in 2017 is shown in Figure 16 on the basis of an 8 percent increase in milk production. Gross output per litre is estimated to have increased in 2017 to 37 cent per litre, representing an 8.6 cent increase on 2016.

The estimated net margin in 2017, of 15.5 cent per litre, represents a 130 percent increase on that recorded in 2016. See Table A5 for estimates of output, costs and margins on a per litre basis for a farm that has achieved an 8 percent expansion in milk production in 2017.

Figure 16: Average Gross Output, Costs & Margins per litre for Irish milk production in 2013-2016 and estimates for 2017

Source: Teagasc National Farm Survey Data and Author estimates
Note: e = estimate

4. Outlook for 2018

The discussion of production costs in 2018 is complicated by the fact that milk production is likely to increase further on many farms. For the purposes of this analysis, a 4 percent increase in total Irish milk production in 2018 is forecast, with a slight increase of 1 percent in the dairy enterprise’s land base.

A further increase in production in 2018 can be expected to lead to increased input usage on farms where expansion takes place. The extent of this increase will be highly farm specific.

4.1 Outlook for Input Expenditure 2018

In this analysis of likely changes in production costs in 2018, for simplicity it is assumed that the average farm increases its milk production by 4 percent in 2018, equivalent to the percentage increase in national production forecast in this paper.

4.1.1 Feed usage and price 2018

Animal feed prices are driven by a combination of Irish cereal harvest prices (for the previous year and current year) and the prices of imported feed. Cereal prices at harvest 2017 were up 5 percent on the 2016 level. International harvests across much of the main production regions of the world, have been high for the fifth year in succession.

The volume of dairy feed used per head appears to have increased significantly in Ireland in 2017 by about 10 percent, which has been reflected by an estimated 5 percent increase in milk yields. With the assumption of normal weather in Ireland in 2018, and with a declining milk price, feed volume requirements per head for grassland enterprises are expected to be broadly similar to 2017 on farms continuing to increase milk production.

Farmers should see a bit of an increase in feed prices in H1 of 2018 and perhaps again at harvest 2018, with international weather conditions likely to determine exactly how grain and feed prices move at that point. An increase in feed prices of 2 percent is forecast for 2018.

An increase in feed volume of 1 percent per head is factored in for 2018. Allowing for a 2 percent increase in dairy hectarage, this would then give rise to a 9 percent increase in feed expenditure on a per hectare basis. Given the assumed 4 percent increase in milk output, this would mean that expenditure on feed is estimated to increase by 7 percent on a per litre basis in 2018.

4.1.2 Fertiliser & Contracting Costs—usage and price 2018

Monthly fertiliser prices are forecast to move upwards through 2018, this means that fertiliser prices in early 2018 will be above the price that prevailed in early 2017. Overall, the annual average fertiliser price in 2018 is forecast to be up 5 percent in 2018 compared with the 2017 level.
As of November 2017, market expectations suggest a slight further weakening of the US$ against the euro in 2018 of the order of 1 or 2 cent from US$ 1.17 to US$1.19 per euro.

It is forecast that fertiliser use in 2018 will be on a par with 2017. With fertiliser prices rising and usage levels unchanged, this would mean that the total expenditure on fertiliser in 2018 would increase by 5 percent on a per hectare basis.

No change in agricultural contracting charges is forecast, with the volume of contracting undertaken and the associated expenditure assumed to remain unchanged in 2018. This would leave total pasture and forage costs per hectare up about 5 percent in 2018 relative to 2017. However, with a forecast increase in milk production of 4 percent, fertiliser and contracting charges in aggregate would increase by 2 percent on a per litre basis in 2018.

4.1.3 Electricity and Fuel – usage and price 2018

An analysis of futures prices indicates that the balance of market opinion sees Brent crude oil prices remaining close to $60 over the course of 2018. This equates to close to €51 pb at a euro exchange rate of $1.19, which would represent an increase of 6 percent in oil prices in euro terms in 2018 relative to 2017. This suggests that there would be a 2 percent increase in farm level fuel prices in 2018. Electricity prices are assumed to increase by 4 percent in 2018, reflecting some upward movement in the wider basket of fuels used to produce electricity. Factoring in a slight increase in usage volume, associated with increased milk production, this would leave expenditure per hectare on energy and fuel up about 5 percent in 2018.

4.1.4 Other Direct and Fixed Costs – usage and price 2018

While the UK’s Brexit decision creates uncertainty, macroeconomic indicators for Ireland remain reasonably positive. Real GDP growth in 2018 is forecast to be 4.0 percent, which is lower than the estimated 5.0 percent for 2017 (ESRI, 2017). Irish unemployment is forecast to fall to 5.4 percent by the end of 2018, taking unemployment to the lowest level since 2008. It can be expected that wage inflation will pick up slightly in 2018 as the labour market tightens further. Therefore an increase in wage rates in 2018 of 2 percent is forecast. The increase in general inflation affecting other farm costs in 2018 is forecast to be 2 percent on a per hectare basis. Allowing for an increase in milk production of 4 percent this would correspond with a 3 percent increase in other direct costs relative to 2017 on a per hectare basis. However, on a per litre basis, these other direct costs would be up just 1 percent.

At an overall farm level fixed costs have been pretty static on dairy farms in 2015 and 2016. Therefore total fixed costs for the overall farm are assumed to remain unchanged in 2018. With a forecast drop in milk prices in 2018, the output value of the dairy enterprise should fall and the dairy enterprise fixed cost allocation should therefore fall slightly in 2018.

4.1.5 Estimate of Total Input expenditure for 2018

Overall, direct costs per hectare are forecast to increase in 2018, mainly due to higher fertiliser, feed and fuel expenditure. However, the 1 percent increase in direct costs on a per litre basis will be negated by a reduction in fixed costs for the dairy enterprise, leaving total production cost per litre in 2018 unchanged on the 2017 level.

4.2 The Outlook for Dairy Markets in 2018

Dairy market prospects for 2018 look slightly negative and it may be that we have already reached the top of the market in this dairy commodity price cycle. The transmission of lower dairy commodity prices to lower farm milk prices will occur with a lag but entering 2018 it is unlikely that any further farm milk price improvements will occur and farm milk prices are more likely to slip as we move towards the peak production season in 2018.

A particular area of concern is the extremely weak SMP market. It seems that it will be difficult to shift the accumulated stock of ageing intervention SMP and some of this may end up going for non-food uses. Prices for SMP seem destined to remain at or below intervention levels and this leads to the question as to whether the EU would make further intervention purchases and at what price? Whether there is a need for intervention at all has been a subject of debate given that farm gate milk prices are not low.

Butter prices should continue to ease back in 2018, but will still remain high relative to what would be...
considered as normal. Returns from cheddar exports to the UK may come under pressure if sterling weakens further.

EU milk production is likely to continue to increase in 2018, perhaps by as much as 2 percent or 3 Mt. In 2017 EU dairy cow numbers are likely to fall by a further 0.1 to 0.2 M head. However, the contraction in cow numbers should be more than offset by stronger growth in milk yields given the reasonably strong milk prices and low feed costs that should prevail.

For 2018 latest forecasts suggest an almost 2 percent (1.8 Mt) increase in US milk production. This increase reflects a combination of increased milk yields and a growth in cow numbers (USDA, 2017).

Production growth in NZ is likely to improve in 2018. Monthly production to date in the 2017/18 season has been adversely affected by poor weather, but the most recent monthly figure suggests that stronger growth potential exists. An increase in NZ milk production of 3 percent (0.7 Mt) in 2018 is forecast.

On the demand side internal EU consumption should continue to increase, with stronger consumption growth for cheese and SMP than in the case of butter, where recent high prices are likely to constrain demand. There is also growing concern that demand for drinking milk is on the wane in some EU Member States. The continuation of low crude oil prices may dampen dairy product import demand (particularly for powders) in countries where oil revenues represent a major share of GDP. However, Chinese dairy import demand may pick up further.

Taking these factors into consideration, it is likely that milk supply growth may slightly exceed demand growth globally in 2018, leading to an easing back in prices for butter and delaying a recovery in SMP prices. Cheddar prices are likely to be influenced by exchange rate developments. Given the seasonal milk production profile in Ireland, an easing of farm milk prices over the coming six months would see a drop in overall average farm milk prices for 2018.

Current (November 2017) Irish farm milk prices are probably at their peak for this cycle. The annual average Irish milk price in 2018 is likely to be down on the 2017 level. A further improvement in milk fat and protein content may also help to lift milk prices on actual constituent basis. Overall, it is estimated that the annual average farm milk price in 2018 will be 10 percent lower than that of 2017, giving rise to an annual average milk price (CSO definition) of about 32.5 to 33 cent per litre, on an actual fat, vat inclusive, basis.

4.3 The Outlook for Milk Production in 2018

The improvement in farm milk prices in 2017, saw a further increase in Irish milk production of an estimated 8 percent. This was achieved mainly through an increase in milk yield of about 5 percent with the residual increase due to higher cow numbers. It is reasonable to expect that, with the high net margin in milk production, further expansion in milk production will occur in 2018. This expansion will be based on increased cow numbers and yield improvement, with a national average increase of 4 percent forecast relative to the 2017 level.

4.4 The Outlook for Dairy Enterprise Net Margins in 2018

This section considers the impact of changes in milk prices and production costs on gross and net margins on dairy farms in 2018. With the exception of fuel and fertiliser, the main sub-components within the dairy production cost basket are forecast to exhibit little change in price in 2018 relative to 2017. It is assumed that further milk expansion in 2018 takes place on a 3 percent larger land area than in 2017. It is also assumed that milk production per hectare will increase by 2 percent in 2018 relative to 2017.

In 2018, profitability per hectare, as measured by the net margin on the average dairy farm, producing 4 percent more milk, is forecast to decrease. Average net margin per hectare is estimated to be €1,800 for 2017, but is forecast to decrease to €1,400 or 22 percent in 2018, as illustrated in Figure 17.

The additional milk production is assumed to be produced at a low marginal cost, which contributes to the margin achieved per hectare. Production costs for the marginal litres are lower since some cost items do not increase in a linear fashion when production increases, e.g. fertiliser expenditure, other direct costs, energy and hired labour and, in particular, fixed costs.
5. Concluding Comments

Dairy margins and farm incomes reached record levels in 2017, with substantially higher milk prices and minimal cost inflation. However, Irish farm milk prices will fall back gradually in 2018. Overall, little change in milk production costs per litre in 2018 relative to 2017 can be expected.

Based on these forecast production levels, output price and input cost movements, dairy margins per litre and per hectare are likely to fall in 2018 compared with the extremely high 2017 level. Average net margins are forecast to be about 11.8 cent per litre or €1,400 per hectare in 2018.

References

AHDB (2016) AHDB Dairy www.dairy.ahdb.org.uk


Acknowledgements

The author would like to acknowledge Brian Moran and John Lennon and the Farm Recorders of the Teagasc National Farm Survey for the provision of data. The authors also appreciate the contributions made by many colleagues and a number of anonymous industry representatives. Any errors or omissions remain the sole responsibility of the authors.
Table A1: Average Gross and Net Margin of Milk Produced

<table>
<thead>
<tr>
<th></th>
<th>2015</th>
<th>2016</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>cent/litre</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Gross Output</td>
<td>32.21</td>
<td>28.47</td>
<td>-12</td>
</tr>
<tr>
<td>Concentrate Costs</td>
<td>4.60</td>
<td>4.65</td>
<td>+1</td>
</tr>
<tr>
<td>Pasture and Forage Costs</td>
<td>4.35</td>
<td>4.15</td>
<td>-5</td>
</tr>
<tr>
<td>Other Direct Costs</td>
<td>3.73</td>
<td>3.65</td>
<td>-2</td>
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<tr>
<td>Total Direct Costs</td>
<td>12.68</td>
<td>12.45</td>
<td>-2</td>
</tr>
<tr>
<td>Gross Margin</td>
<td>19.53</td>
<td>16.02</td>
<td>-18</td>
</tr>
<tr>
<td>Energy and Fuel</td>
<td>1.94</td>
<td>1.96</td>
<td>+1</td>
</tr>
<tr>
<td>Labour</td>
<td>0.44</td>
<td>0.43</td>
<td>-2</td>
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<tr>
<td>Other Fixed Costs</td>
<td>7.33</td>
<td>6.91</td>
<td>-6</td>
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<tr>
<td>Total Fixed Costs</td>
<td>9.71</td>
<td>9.30</td>
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<tr>
<td>Net Margin</td>
<td>9.82</td>
<td>6.72</td>
<td>-32</td>
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Source: Teagasc National Farm Survey Data

Table A2: Average Net Margin per hectare*

<table>
<thead>
<tr>
<th></th>
<th>2015</th>
<th>2016</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk Produced</td>
<td>litres/ha</td>
<td>10,755</td>
<td>11,087</td>
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<tr>
<td>Total Gross Output</td>
<td>€/ha</td>
<td>3,475</td>
<td>3,170</td>
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<tr>
<td>Total Costs</td>
<td>€/ha</td>
<td>2,392</td>
<td>2,378</td>
</tr>
<tr>
<td>Net Margin</td>
<td>€/ha</td>
<td>1,083</td>
<td>792</td>
</tr>
</tbody>
</table>

* - Hectare of forage area allocated to the dairy enterprise
Source: Teagasc National Farm Survey Data

Table A3: Costs and profit (cent per litre) for Top, Middle and Bottom one-third of farms in 2016

<table>
<thead>
<tr>
<th></th>
<th>Top</th>
<th>Middle</th>
<th>Bottom</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>cent/litre</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concentrate Feeds</td>
<td>3.96</td>
<td>4.65</td>
<td>5.33</td>
</tr>
<tr>
<td>Pasture &amp; Forage</td>
<td>3.67</td>
<td>3.89</td>
<td>4.90</td>
</tr>
<tr>
<td>Other Direct Costs</td>
<td>3.50</td>
<td>3.50</td>
<td>3.93</td>
</tr>
<tr>
<td>Energy &amp; Fuel</td>
<td>1.72</td>
<td>1.79</td>
<td>2.37</td>
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<tr>
<td>Labour</td>
<td>0.79</td>
<td>0.30</td>
<td>0.19</td>
</tr>
<tr>
<td>Other Fixed Costs</td>
<td>6.53</td>
<td>6.94</td>
<td>7.27</td>
</tr>
<tr>
<td>Total Costs</td>
<td>20.17</td>
<td>21.06</td>
<td>23.99</td>
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<tr>
<td>Net Margin</td>
<td>9.93</td>
<td>6.89</td>
<td>3.37</td>
</tr>
</tbody>
</table>

Source: Teagasc National Farm Survey Data
### Table A4: Output and profit per hectare for Top, Middle and Bottom one third of farms in 2016

<table>
<thead>
<tr>
<th></th>
<th>Top</th>
<th>Middle</th>
<th>Bottom</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stocking rate cows/ha</td>
<td>2.54</td>
<td>2.04</td>
<td>1.63</td>
</tr>
<tr>
<td>Milk sold litres per ha</td>
<td>14,675</td>
<td>10,968</td>
<td>7,644</td>
</tr>
<tr>
<td>Concentrates fed per cow kg</td>
<td>896</td>
<td>967</td>
<td>941</td>
</tr>
<tr>
<td>Concentrates fed per litre of milk produced kg</td>
<td>0.15</td>
<td>0.18</td>
<td>0.20</td>
</tr>
<tr>
<td>Gross output € per ha</td>
<td>4,391</td>
<td>3,048</td>
<td>2,081</td>
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<tr>
<td>Direct Costs € per ha</td>
<td>1,657</td>
<td>1,335</td>
<td>1,091</td>
</tr>
<tr>
<td>Gross Margin € per ha</td>
<td>2,734</td>
<td>1,713</td>
<td>990</td>
</tr>
</tbody>
</table>

Source: Teagasc National Farm Survey Data

### Table A5: Average Gross and Net Margin per litre of Milk Produced 2015-2018

<table>
<thead>
<tr>
<th></th>
<th>2015</th>
<th>2016</th>
<th>2017e</th>
<th>2018f</th>
</tr>
</thead>
<tbody>
<tr>
<td>cent/litre</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Gross Output</td>
<td>32.21</td>
<td>28.47</td>
<td>37.0</td>
<td>33.28</td>
</tr>
<tr>
<td>Concentrate Costs</td>
<td>4.60</td>
<td>4.65</td>
<td>4.81</td>
<td>5.05</td>
</tr>
<tr>
<td>Pasture and Forage Costs</td>
<td>4.35</td>
<td>4.15</td>
<td>3.92</td>
<td>4.01</td>
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<tr>
<td>Other Direct Costs</td>
<td>3.73</td>
<td>3.65</td>
<td>3.51</td>
<td>3.54</td>
</tr>
<tr>
<td>Total Direct Costs</td>
<td>12.68</td>
<td>12.45</td>
<td>12.23</td>
<td>12.6</td>
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<tr>
<td>Gross Margin</td>
<td>19.53</td>
<td>16.02</td>
<td>24.77</td>
<td>20.68</td>
</tr>
<tr>
<td>Energy and Fuel</td>
<td>1.94</td>
<td>1.96</td>
<td>1.96</td>
<td>2.01</td>
</tr>
<tr>
<td>Labour</td>
<td>0.44</td>
<td>0.43</td>
<td>0.43</td>
<td>0.44</td>
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<tr>
<td>Other Fixed Costs</td>
<td>7.33</td>
<td>6.91</td>
<td>6.91</td>
<td>6.43</td>
</tr>
<tr>
<td>Total Fixed Costs</td>
<td>9.71</td>
<td>9.30</td>
<td>9.29</td>
<td>21.49</td>
</tr>
<tr>
<td>Net Margin</td>
<td>9.82</td>
<td>6.72</td>
<td>15.48</td>
<td>11.79</td>
</tr>
</tbody>
</table>

Source: Teagasc National Farm Survey Data. Figures for 2017 are estimates.
Irish Cattle Farming in 2016

- **Irish Cattle Slaughter**: 1.744 million head (up 5%)
- **Stocking Rate (Calf to Weanling)**: average of 1.25 LU/ha (up 6%)
- **Live Exports**: 0.145 million head (down 18%)
- **Stocking Rate (Calf to Store)**: average of 1.46 LU/ha (up 7%)
- **Irish Suckler Cow Numbers**: 1.042 million (down 1.1%)
- **Stocking Rate (Calf to Finishing)**: average of 1.6 LU/ha (up 7%)
- **Weanling price**: average €817/head (down 2%)
- **Stocking Rate (Cattle Finishing)**: average of 1.49 LU/ha (up 1%)
- **Male Store price**: average €966/head (down 4%)
- **Concentrate Fed/LU (Cattle Finishers)**: average 719 kg (down 6%)
- **Female Store sale price**: average €905/head (down 6%)
- **Slaughter Weight/Head**: average 340 kg (up 1.8%)
- **Male Finished Animals Price**: average €1,460/head (down 5%)
- **Total Production Costs (Single Suckling)**: average €920 per hectare (up 2%)
- **Female Finished Animals Price**: average €1,271 head (down 9%)
- **Total Production Costs (Cattle Finishing)**: average €1,1133 per hectare (up 3%)
- **Gross Margin (Single Suckling)**: average €433 per hectare (down 7%)
- **Gross Margin (Cattle Finishing)**: average €545 per hectare (up 18%)

*Source: Teagasc National Farm Survey, Central Statistics Office and Bord Bia*
**Irish Cattle Farming in 2017**

- **Lower output prices** for calves
- **R3 Steer price** up 2% on the 2016 level
- **Weanling and Store prices** down 4% and up 3% respectively
- **Weather Conditions** Generally good, except in late season
- **Grass Availability** Not as good as 2016
- **Fertiliser Prices** down 6% on 2016 level
- **Fertiliser Use** up 5% on 2016 level
- **Feed Prices** down 2%
- **Feed use** up 2%
- **Other Direct Costs** down 2% on the 2016 level
- **Fuel prices** down 8% on the 2016 level
- **Total Input Costs** Overall, input costs slightly higher than in 2016
- **Gross Margin (Suckler)** unchanged on the 2016 level
- **Gross Margin (Finisher)** up 8% on the 2016 level

**Source:** Teagasc Estimates for 2017 and Forecasts for 2018

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**Irish Cattle Farming in 2018**

- **Higher output prices** for young and adult animals
- **R3 Steer prices** up 3% on the 2017 level
- **Weanling and Store prices** up 3% on the 2017 level
- **Weather Conditions** Normal weather assumed
- **Grass Availability** not as good as 2017
- **Fertiliser Prices** up 5% on 2017 level
- **Fertiliser Use** little changed on 2017 level
- **Feed Prices** up 2%
- **Feed use** up 2%
- **Other Direct Costs** up 3% on the 2017 level
- **Fuel prices** up 3% on the 2017 level
- **Total Input Costs** Overall, input costs slightly higher than in 2017
- **Gross Margin (Suckler)** up 4% on the 2017 level
- **Gross Margin (Finisher)** up 5% on the 2017 level
Review of Cattle Farming in 2017 and Outlook for 2018

Jason Loughrey and Kevin Hanrahan
Agricultural Economics and Farm Surveys Department, Teagasc

1. Introduction

This paper presents a review of the economic performance of Irish cattle production in 2016 based on data provided by the Teagasc National Farm Survey (Dillon, Moran and Donnellan 2017). Estimated returns from cattle production in 2017 and the forecast for 2018 are also presented.

Notwithstanding the volatility in Irish cattle prices during the course of 2017, the average annual price for most categories of finished cattle changed only moderately from the average levels reported for 2016. In the case of R3 steer prices and young bull prices, an increase of approximately 2 percent is reported between 2016 and 2017, while heifer prices declined by approximately one percent, due to relatively weak prices in the first quarter of 2017.

As a result of these developments, prime finished cattle prices are only 1 percent higher in 2017 relative to 2016. The relatively small annual increase in prices means that finished cattle prices remain significantly lower than the levels reported in 2015.

Calf prices have on average declined in 2017, with prices for beef calves declining by 2 percent compared with 2016. Weanling and store cattle prices, in line with prime cattle prices, have varied during 2017. Prices of young cattle were lower than in 2016 during the spring, but over the course of the year, with improving finished cattle prices, young cattle prices have improved. By autumn 2017 store cattle prices are higher than in 2016.

These price dynamics have meant that the market value of farm output on Irish cattle rearing and finishing farms has diverged somewhat in 2017. This value of farm output on Irish cattle rearing and finishing farms has increased on average the Cattle Finishing enterprises, while we estimate that it has been on stable on Single Suckling enterprises due to higher store cattle prices this autumn offsetting lower weanling and calf prices received in Spring 2017. On Cattle Finishing farms the prices paid for cattle purchased in affect the value of output. Overall our assessment is that prices of young cattle have not moved appreciably in 2017 compared to 2016, and in our estimates for 2017 output value per hectare and margins on the Cattle Finishing enterprises the moderate improvement in finished cattle prices and increased volume of output per hectare are the key drivers of estimated increases in in output value.

With some of the increase in output value on Cattle Finishing enterprises driven by rising cattle numbers we estimate that there has been a 3 percent rise in the quantity of concentrates used. This rise in concentrate usage means that the rise in Gross Output value does not fully translate into an equivalent absolute increase in margins. Higher overall input expenditure partially offsets the positive impact of higher output value on margins.

On average gross margins on Single Suckling farms are estimated to have marginally improved in 2017 with lower direct costs of production the key driver given the estimated stable output value. The receipt of payments under the Beef Data Genomics Programme (BDGP) supports Gross Margins on Cattle Rearing farms. On average Single Suckling farms are estimated to have earned marginally negative net margins in 2017.

On Cattle Finishing enterprises the increase in finished cattle prices in 2017 and higher levels of output volume per hectare, were reflected in higher output value. Overall, cattle finishers are expected to see output value increases in the region of 4 percent during the course of 2017.

This increase in Gross Output per hectare is partially offset by increases in input costs primarily driven by higher feed costs. The average Gross margin per hectare on the Cattle Finishing enterprise increased in absolute terms by €46 to reach €592 in 2017. A relatively small increase in overhead costs due to a rise in fuel costs has made a small negative impact of net margins. Despite this increase in overhead costs, the Cattle Finishing enterprises net margins have almost doubled to €56 per hectare in 2017.
The outlook for Irish cattle markets in 2018 is mixed and surrounded by acute uncertainty. Supply and use developments for beef in Ireland and the EU during 2018 are likely to mean that cattle prices in Ireland will increase relative to the average levels received by Irish farmers in 2017. However, developments in currency exchange rates during 2018, arising from the Brexit negotiations, could generate price reductions with other implications including some lower (imported) input costs.

On the assumption that the euro/pound sterling exchange rate stays at or close to the value currently observed, our forecast is that prices for cattle in 2018 will be slightly higher than in 2017. Growth in per capita demand for beef in the EU is forecast to be marginally negative due to an increase in beef prices (European Commission 2017). UK demand is subdued as a result of relatively weak economic growth (HM Treasury 2017). Rising poultry and pig meat prices in 2018 should support the consumption of beef. The relatively high price of poultry in particular, will limit the extent of substitution away from beef.

EU beef supplies increased between 2012 and 2016 but this trend has come to an end. The dynamics behind those increases are attributed largely to developments in dairy markets. In 2016, low milk prices led to a large increase in the volume of cows slaughtered in the EU, which boosted EU beef production. This increase in cow slaughter was reflected in the cessation of the post-quota expansion of the EU dairy cow herd. The increases in cow inventories resulted in higher numbers of other cattle on feed.

Overall, the decline in aggregate EU production and supply of beef and in the context of stronger world market prices (USDA, 2018) is expected to lead to some increases in EU cattle prices. Global production and exports of beef are both expected to grow in 2018 (USDA, 2018). The forecast increase in meat production is largely driven by developments in the US and Brazil, with these two countries alone accounting for approximately half of the production growth in 2018. In the US, the recent breeding herd rebuilding phase is reflected in increased meat production. The US faces renewed competition in Asian markets from Australia as the Australian herd rebuilding begins to be reflected in increased production. Robust growth in China’s beef demand is expected to underpin global beef prices in 2018.

On balance our forecast for 2018 is that Irish cattle prices will increase moderately. Despite Increases in the volume of cattle available for slaughter in Ireland, higher EU cattle and beef prices and an unchanged average euro pound sterling exchange rate in 2018 are forecast to result in Irish cattle prices that are 3 percent higher than observed in 2017.

As in previous years, developments in the euro/pound sterling exchange rate will affect Irish cattle prices given the continuing dependence of the Irish beef industry on the UK market. In 2016 and 2017, the weakening of sterling undermined Irish cattle prices. In this outlook we have assumed no further depreciation of the pound relative to the euro from its current level (November 2017). Continued uncertainty over the evolution of the exchange rates constitutes a very major element of the uncertainty in these forecasts.

The BDGP will during 2017 and 2018 provide exchequer support to participating farmers to enable them to improve the genetic merit of their beef animals and thereby lower the greenhouse gas intensity of their beef production. The BDGP involves a payment of approximately €80 per cow for farmers participating. However, not all suckler cows will be farmed by participating farmers and the budget for the programme is limited to approximately €52 m per annum. This means that the average value of the BDGP per cow to suckler cow farmers will be lower than the headline rate. In this analysis as in Hanrahan (2016) we have assumed that the average suckler farmer will receive a payment of €44 per hectare from the BDGP in 2017 and 2018.

Unless stated otherwise, all figures referred to in this paper are in nominal terms and all enterprise output and profit estimates exclude the value of decoupled income support payments and are expressed per hectare.


The trends in average family farm income (FFI) for the two types of cattle farms identified in the Teagasc NFS over the period 2012 to 2016 are shown in Figure 1. In 2016, the average FFI on Teagasc NFS Cattle Other farms increased somewhat compared with 2015 levels while the average FFI on Teagasc NFS Cattle Rearing farms declined slightly. The 2016 FFI on Cattle Rearing farms declined by one percent while the average
FFI on Cattle Other farms increased by 3 percent when compared with the 2015 level. For Cattle Rearing farms, a 10 percent rise in the value of direct payments helped offset some of the reduction in market income. Figure 1 also illustrates that the gap in average FFI earned by farms in the Cattle Rearing system and Cattle Other system grew in 2016.

In this year’s analysis, we continue to present results based on the two way categorisation of Irish cattle enterprises: Single Suckling and Cattle Finishing enterprises first used in Breen and Hanrahan (2012) and the Teagasc NFS cattle enterprise fact sheets (Teagasc, 2017a and 2017b).

Single Suckling enterprises in the analysis that follows are enterprises with more than 10 cows, while the Cattle Finishing enterprises analysed are those with more than 10 livestock units and where more than 70 percent of the animals sold off of the farm were sold for slaughter. In total, these two enterprises were present on more than 40,000 farms nationally.

Figure 1: Family Farm Income on Cattle Rearing and Cattle Other Farm Systems: 2012 to 2016

Source: 2016 Teagasc National Farm Survey (2017)

There was considerably more variability in the average gross output per hectare between the least profitable and most profitable farms. The most profitable third of Single Suckling enterprises earned an average gross output of €1,312 per hectare, compared with an average gross output of €562 per hectare on the least profitable one third of Single Suckling enterprises. This variability in average gross output is largely due to higher average stocking on the more profitable farms. In 2016, the most profitable Single Suckling enterprises had an average stocking rate of 1.76 livestock units (LU) per hectare compared with 1.1 LU per hectare for those enterprises with the lowest levels of profitability. The capacity of farms to operate at high stocking rates is limited by the quality of the land farmed. In 2016, three quarters of the most profitable Single Suckling enterprises farmed very good soils, whereas the proportion of the least profitable Single Suckling farms on very good soils was considerably lower at less than 23 percent.

2.1 Irish Beef Enterprise Performance in 2016

This section discusses the cost structure of Single Suckling and Cattle Finishing enterprises in Ireland. Farms with these enterprises have been ranked on the basis of gross margin earned per hectare and each farm enterprise group has been broken into three equally sized sub-groups, which we have termed farms that are least profitable, those that have average profitability and those that are most profitable.

Single Suckling: In 2016, the average direct cost of production per hectare for Single Suckling enterprises ranged from €433 per hectare, on those farms with the lowest average gross margin, to €553 per hectare on the most profitable farms (see Figure 2). The cost of concentrate feed, along with the cost of pasture and winter forage typically accounts for approximately 80 percent of the direct costs of production on Single Suckling farms. The average expenditure on concentrate feed varied from €115 per hectare on the average profitability farms to €140 per hectare on the high profitability farms.

Figure 2: Variation in Total Production Costs and Gross Output on Single Suckling enterprises in 2016

Source: 2016 Teagasc National Farm Survey (2017)
The most profitable one third of Single Suckling enterprises in 2016 had an average gross output per hectare that was 133 percent higher than the average output per hectare on the least profitable one third of enterprises, while average direct costs per hectare were only 28 percent higher.

**Cattle Finishing:** The second cattle enterprise category analysed is the Cattle Finishing enterprise. The enterprises analysed were again ranked on the basis of gross margin per ha and assigned to three equally sized groups termed **least, average and most profitable**.

Average direct costs of production per hectare were highest on the most profitable farms and lowest on those farms with lower levels of profitability (see Figure 3). Total expenditure on concentrate feed is substantially higher on Cattle Finishing enterprises than on Single Suckling enterprises. The most profitable one third of Cattle Finishing enterprises had a gross output of €1,875 per hectare compared with €536 per hectare on the least profitable Cattle Finishing enterprises.

**Figure 3: Variation in Total Production Costs and Gross Output on Cattle Finishing Enterprises in 2016**

As with Single Suckling enterprises there is a large degree of heterogeneity in gross output per hectare across the Cattle Finishing enterprises analysed. This diversity reflects the differing levels of production intensity on these farms. The average stocking rate on the least profitable Cattle Finishing enterprises was 1.11 LU per hectare, while the average stocking rate on the most profitable one third of Cattle Finishing enterprises was 1.99 LU per hectare. In general, more profitable Cattle Finishing enterprises were on farms with better soil, 75 percent of the most profitable Cattle Finishing enterprises farmed very good soils, while only 45 percent of the least profitable farms farmed very good soils.

The results presented in Figure 2 and Figure 3 highlight the differences in costs per hectare on Single Suckling and Cattle Finishing enterprises. However, it is important to recall that there is even greater variation in gross output across different farm enterprises. While higher levels of gross output per hectare are in general associated with high levels of direct costs of production and farming on better than average soils, the difference in technical performance and productivity between the top one third and bottom one third of Cattle Finishing enterprises remains striking.

**Figure 4: Cattle Enterprise Net Margins per hectare in 2016**

Average overhead costs per hectare on the Cattle Finishing and Single Suckling enterprises were €514 and €440 per hectare respectively (see Appendix Table A1 and Table A2 at the end of this paper). The higher level of overhead expenditure on Cattle Finishing farms reflects both the higher average intensity of production on these farms when compared with Single Suckling enterprises and their higher average stock of non-livestock capital (buildings and machinery) per hectare.

A comparison of the net margins earned by the Single Suckling and Cattle Finishing enterprises in 2016 shows that, on average, the Cattle Finishing enterprises performed better than the Single Suckling enterprises. The average net margin was positive for Cattle Finishing farms in 2016 although this is entirely due to the performance of the most profitable one third of Cattle Finishing enterprises.

On Single Suckling farms, the net margins became more negative, representing a slight decline in
performance in 2016. The improved performance of the Cattle Finishing enterprises can be attributed to a rise in gross output and a decline in concentrate costs. Figure 4 shows the net margins earned on the two cattle enterprises analysed and illustrates that in 2016 only the most profitable one thirds of Cattle Finishing and Single Suckling enterprises earned positive net margins.

3. Estimated Performance of Irish Cattle Farms in 2017

This section of the paper presents a review of the economic performance of Irish cattle enterprises in 2017. A discussion of the estimated changes in input usage and input costs in 2017 is first presented and this is followed by a discussion of estimated changes in output value. Estimates of margins earned by Single Suckling and Cattle Finishing enterprises in 2017 are then presented.

Estimates for 2017 and forecasts for margins in 2018 (which are presented in Section 4) are based on small increases in the intensity of production per hectare on cattle finishing farms. The impact of an increase in the intensity of production on individual enterprises would be expected to vary from enterprise to enterprise. In some cases it could increase profitability, in others it could give rise to lower margins. In 2017 and 2018 aggregate production of beef in Ireland is forecast to increase, while suckler cow inventories in 2017 are estimated to have declined relative to 2016.

3.1 Estimated Input Usage and Price 2017

3.1.1 Feedstuffs

Purchased feed (concentrates) is an important element of the direct cost of beef production in Ireland. Typically this cost item accounts for approximately 30 percent of total direct costs on Single Suckling enterprises and 40 percent of direct costs on Cattle Finishing enterprises.

2017 was a normal year in terms of grass growing conditions and as a consequence the availability of grass was not a major driver of changes in the volumes of feed stuffs purchased by Irish beef farmers. The aggregate volume of purchased feed used by Irish cattle farms in 2017 is marginally higher than in 2016. Overall, it is estimated that feed use per head is likely to be stable, but that based on increases in Irish non-dairy cattle inventories that aggregate feed use and feed use per hectare (particularly on cattle finishing farms) in 2016.

Figure 5 presents the CSO monthly price index for cattle feed stuffs for the period January 2010 to September 2017. Cattle feed prices have remained largely stable through the first three quarters of 2017 and over the course of the full year cattle feed prices are estimated to have declined relative to 2016.

**Figure 5:** Monthly Price Index of Cattle Meal in Ireland 2010 to 2017

With some increase livestock numbers on a per hectare basis and a moderate decline in feed prices, we estimate that expenditure on concentrates by Irish cattle farmers in 2017 will be marginally higher compared to 2016.

3.1.2 Fertiliser in 2017

Figure 6 presents data on fertiliser prices over the past seven years. Fertiliser prices declined strongly over the course of 2017, a continuation of the 2016 trend.

**Figure 6:** Monthly Price Index of Fertiliser in Ireland from 2011 to 2017

Source: CSO (2017)
The declining levels of Irish fertiliser prices have contributed to reduction in direct costs of production on Irish cattle farms. It is estimated that while fertiliser usage may have increased in 2017 the increase in volume has not been sufficient to bring about a rise in overall direct costs.

3.1.3 Energy and Fuel in 2017

In 2017 the average price for crude oil increased to close to $54 per barrel (pb) and reached $60 mark by the end of 2017. On average the US dollar price of oil was 17 percent higher in 2017 than in 2016. The movement in dollar prices in 2017 has also been reflected in the change in euro prices. The weakening of the dollar and the rise in the euro/US dollar exchange rate has contributed to an increase in euro terms of about 20 percent on the 2016 value of €40 pb.

As a result of the change in oil prices and the inelastic nature of farmer demand for fuel, fuel expenditure on Irish cattle farms is estimated to have increased by 7 percent in 2017 relative to the 2016 level. The smaller increase in farm level fuel costs as compared to crude oil prices reflects the impact of taxes and other activity along the energy supply chain.

While no official data on contractor charges exists, based on industry provided information, we estimate that for 2017 farmer contracting charges will have remained largely unchanged as compared to 2016. When combined with reduced expenditure on fertiliser, this means that overall expenditure on pasture and forage by cattle farmers in 2017 is estimated to have declined slightly when compared to 2016.

Electricity costs change infrequently in Ireland due to the regulation of energy prices. On an annual average basis, prices in 2017 are estimated to have decline by 2 percent compared to 2016.

3.1.4 All Other Direct and Overhead Costs—usage and price 2017

Wages in Ireland are estimated to have increased 1 percent in 2017 due to the on-going recovery in the Irish labour market; however, given the low usage of hired labour on Irish cattle farms, this development does not have a major impact on costs of production. The price level of other direct costs is estimated to have declined by 1 percent in 2017. No change in expenditure on other fixed costs is estimated for 2017.

3.1.5 Estimate of Total Direct Costs for 2017

Figure 7 compares the average direct costs of production for the Single Suckling and Cattle Finishing enterprises in 2016 with the estimated direct costs for 2017. On average total direct costs on Single Suckling enterprises are estimated to have declined by 1 percent and direct costs on Cattle Finishing enterprises are estimated to have increased by 1 percent. The increase on Cattle Finishing enterprises is due to the rise in concentrate usage attributable to the rise in production per hectare. With moderate changes in the price of overheads, overall costs of production in 2017 are estimated to have remained stable on Single Suckling farms and increased by 2 percent on Cattle Finishing farms.

3.2 Estimated Output Values 2017

The value of gross output on Single Suckling enterprises is estimated to remained largely stable in 2017, with lower prices for young cattle (calves and weanlings) in the Spring of 2017 offset by higher prices for store cattle in the Autumn of 2017. The estimated average R3 steer price for 2017 of around €382/100kg represents a 2 percent increase on the price level in 2016. The average increase in young bull prices in 2017 largely mirrored that observed for steers, with prices in 2017 estimated to be approximately 2 percent higher than in 2016. Figure 8 presents average R3
steer and weanling prices for the period 2005 to 2016 and an estimate for 2017.

Stable prices for cattle purchased in by Cattle Finishing farms mean that developments in estimated output per hectare are driven by finished cattle prices at factories and the volume of output produced per hectare. Our estimate is that market output value on Cattle Finishing farms in 2017 has increased by more than the headline increase in finished cattle prices due to higher volumes of output per hectare. In 2017 the value of output per hectare on Cattle Finishing farms is estimated to be €1,212.

Figure 8: Irish Cattle Prices 2005 to 2017

Source: DG Agri. and CSO; * Author’s estimate 2017.

Gross output per hectare on Single Suckling farms in 2017 is estimated to have remained stable at €913 per hectare. The most profitable one third of Single Suckling enterprises, due to higher stocking rates and other factors, continue to achieve significantly higher output per hectare (€1,312 per hectare) as compared to the average (€877 per hectare) and least profitable (€562 per hectare) enterprise groups.

Gross output per hectare in 2017 was on average higher on Cattle Finishing enterprises than on Single Suckling enterprises. This largely reflects the higher stocking density per hectare on these farms. The average level of gross output per hectare for Cattle Finishing enterprise in 2017 is estimated to be €1,212 (an increase of 4 percent on the level in 2016).

In our estimates and forecasts for 2017 and 2018 we have incorporated the payments made to cattle farmers under the Government’s BGDP. The payments under the BGDP are contingent on farmers undertaking specified measures, some of which will involve additional costs. Nevertheless, payments under the BGDP are still likely to add to participant’s output value. However, not all farmers with suckler cows will be able or want to participate in the programme. Current information indicates that approximately 24,000 farms with 550,000 cows are participating in the programme. The BDGP has an annual budget of €52m. In our analysis the return per hectare in 2016 and 2017 is assumed to be €44 per hectare. For suckler farmers who actually participate in the programme the value per hectare of BDGP participation will be higher than the level assumed.

Figure 9: 2016 Gross Output for Single Suckling (SS) and Cattle Finishing (CF) Enterprises and Estimate for 2017

Source: 2016 National Farm Survey (2016) and Author’s Estimates 2017

Again, as with Single Suckling enterprises, there is a large degree of variation in the value of gross output per hectare between the least profitable, average profitability and most profitable groups of Cattle Finishing enterprises. The most profitable Cattle finishing enterprises are estimated to have produced an average level of gross output per hectare (€1,951 per hectare) that was 250 percent higher than the average value of output per hectare on the least profitable group of Cattle Finishing enterprises (€558 per hectare).

3.3 Beef Enterprise Margin Estimates for 2017

As shown in Figure 7, the estimated expenditure on concentrate feed by finished cattle enterprises increased in 2017. Increased feed volumes more than offset the decline in feed prices in terms of their impact on overall expenditure. In the case of the Single Suckling enterprise, the price decline is the dominant factor. Feed expenditure on Single Suckling enterprises is estimated to have declined in 2017.
On both the Single Suckling and Cattle Finishing enterprises the expenditure on pasture and forage costs remained fairly stable in 2017. Total direct costs on both cattle rearing and cattle finishing enterprises are estimated to have changed only marginally in 2017.

On single suckling enterprises the receipt of payments associated with participation in the BDGP and stable direct have combined with stable output prices to leave margins slightly higher than in 2016. For the cattle finishing enterprise gross margins are estimated to have increased in 2017 due a combination of higher output prices, stable direct costs of production and increased volumes of output per hectare.

Single Suckling enterprises in 2017, are on average estimated to have experienced a small negative net margin of €10 per hectare and farmers that are not participating in the BDGP are likely to incur further negative net margins. Cattle Finishing enterprises are estimated to have earned, on average, a positive net margin of €56 per hectare.

Table A1 and Table A2 decompose the Single Suckling and Cattle Finishing population into 3 groups of equal number on the basis of profitability (gross margin per hectare) and presents estimates of gross output, direct costs, gross margin and net margin for 2017.

For the Cattle Finishing enterprise, the top and middle one third of farmers are estimated to have earned positive net margins. On Single Suckling enterprises only the top one third of enterprises are estimated to have earned positive net margins in 2017, while the average profitability group are estimated to have broken even on a per hectare basis. The low net margins earned on the average Cattle Finishing enterprise and the negative profit on average single suckling farms, highlights the persistent profitability challenges in Irish beef production.

4. Outlook for 2018

In this section we forecast the expenditure for various input items, the beef price that is expected to prevail in 2018 and the incomes from the production of cattle in 2018.

4.1 The Outlook for Input Expenditure

4.1.1 Feedstuffs in 2018

Global cereal and oilseed futures market prices point to moderate increases in feed prices in 2018. Cereal and other feed ingredient input prices have increased somewhat in 2017 as compared to 2016. The 2018 harvest price for cereals and oilseeds will affect the price of feed in the back end of 2017. At this stage our forecast for world cereal and oilseed prices is for some increase relative to 2017.

For 2018 our feed use forecasts are based on an assumption of normal grass growing conditions. This is likely to lead to little or no change in feed use per livestock unit in 2018. However, a moderate increase in the cattle population on finished cattle enterprises will contribute to some increases in overall feed usage. With cattle feed prices forecast to rise moderately in 2018 and volumes used increase, our forecast is for a 5 percent increase in overall feed expenditure on Cattle Finishing enterprises. It is projected that no change in livestock numbers will occur on the Single Suckling enterprises. It is therefore estimate that a 2 percent increase in overall feed expenditure will occur on Single Suckling enterprises during 2018.

4.1.2 Fertiliser in 2018

Given the developments in global supply and global demand, the outlook for international fertiliser prices in 2018 is for prices for most fertilisers to increase relative to 2017 levels. This however will mean that as compared to the average level of fertiliser prices in 2017, prices in 2018 are forecast to be on average 5 percent higher than in 2017.

Fertiliser use on grassland farms was slightly higher in 2017. In our 2018 forecast we assume that on average fertiliser use will be unchanged relative to the 2017 level.

With slightly higher prices and unchanged usage our forecast for total expenditure on fertiliser is for a small increase in 2018 relative to 2017. With contracting charges not expected to change in 2018, total expenditure on pasture and forage by Irish cattle farmers in 2018 is forecast to increase by 2 percent relative to the 2017 level.

4.1.3 Energy and Fuel in 2018

An analysis of futures prices indicates that the balance of market opinion sees Brent crude oil
prices averaging close to US $52 pb for 2017 or €48 pb. This futures contract price, if reflected in spot prices through 2017, would represent an increase of 22 percent on the average 2016 level. We forecast that prices at the pumps as paid by farmers are likely to increase as a result by 2 percent in 2018 over and above the levels paid on average in 2017.

Electricity prices are forecast to increase by 4 percent in 2018. With a forecast of slightly higher electricity prices this should mean that overall expenditure on energy and fuel on cattle enterprises up by approximately 3 percent in 2018 relative to the 2017 level.

4.1.4 Other Direct and Fixed Costs in 2018

Increases in the cost of labour are forecast for 2018 due to continuing growth in the Irish economy, however, on the average Irish cattle enterprises hired labour costs are very small and inflation in labour costs is not expected to have a major impact on costs of production. General inflation is likely to continue to be low and lead to an increase in other direct costs of 2 percent. Other overhead (fixed) costs are also forecast to increase by 1 percent in 2018 relative to their level in 2017.

4.2 The Outlook for Cattle and Beef Markets 2018

Ireland exports close to 90 percent of its beef production and is the fifth largest net-exporter of beef in the world (CSO 2017c, USDA 2017). Conditions in markets to which Irish beef and cattle are exported largely determine Irish cattle prices; though supply developments in Ireland can cause Irish cattle prices to deviate from export market prices over the short run.

Figure 10 illustrates the destinations of Irish beef exports in 2017 (year to end of September). The continuing dominance of the UK in Ireland’s beef exports is clear as is the relatively minor role of extra-EU markets in the current Irish beef export mix. The dominance of the UK largely reflects the relative profitability of the UK as an export destination.

Developments in the sterling exchange rate since the calling of the UK Brexit referendum have dramatically reduced the euro value of Irish beef exports to the UK market (relative to what they would have been if the referendum had not been called). Over the medium to longer term the introduction of any barriers to trade between the UK and Ireland (and other EU member states) will also be reflected in lower Irish cattle prices. In the short run, the depreciation of the pound sterling against the euro, which occurred as a result of Brexit, will mean that the Irish beef exports to the UK are going to be less valuable in euro terms. This development has been reflected in lower cattle prices to Irish farmers.

In the short run the outlook for finished cattle supplies and for beef supply in Ireland are determined by the current inventories of animals aged 1-2 years. Data from the Department of Agriculture, Food and the Marine AIMS database provide insights into developments in these inventories. Inventories for animals aged 18-24 months of age are higher than in 2016, indicating that in 2018 supplies of finished cattle will increase moderately relative to current (2017) levels.

In the rest of the EU supplies of cattle for slaughter in 2018 are likely to be lower than in 2017. Overall EU production of beef in 2018 will be lower than in 2017. Supplies of finished cattle in Ireland and beef production are over the full year likely to be higher than in 2017.

In the medium term (beyond 2017) inventories of breeding animals are the key determinant of beef supply. Figure 11 illustrates the recent trends in dairy and beef cow inventories in the EU (readers should note that the different scales on right and left axes). In anticipation of the abolition of milk quotas in April 2015 the numbers of dairy cows in the EU increased, however low levels of
profitability in 2015 and 2016 have effectively halted and reversed this recent trend.

Dairy cows now account for more than two thirds of the stock of cows in the EU. Under the CAP many Member States have introduced coupled direct payments related to both numbers of dairy and suckler cows and these policy measures will mitigate the impact of on-going low levels of profitability on cow numbers. Over the medium term, however, the greater profitability of dairy production in the EU, when compared to suckler cow production, is likely to lead to an increase in the share of dairy cows in the total EU breeding cow stock. Developments in dairy production and dairy cow numbers will increasingly dictate the volume of EU beef production and specialised beef producers will increasingly see, in the post-quota world, their economic fortunes buffeted by developments in cattle supplies that originate in the dairy sector.

Figure 11: EU28 Cow Numbers (June) 2003 - 2017

Source: Own elaboration based on Eurostat (2017)

Given the decline in EU beef production forecast for 2018, the outlook for EU (and Irish) finished cattle prices depends importantly on the prospects for beef demand in the UK and the Eurozone, and on developments in the euro exchange rate with the pound sterling.

The macroeconomic outlook for the Eurozone is increasingly positive. The forecast macroeconomic outlook for the UK, the Irish beef sector’s largest export market is less promising however (HM Treasury, 2017). While the UK economy continues to grow, Brexit is expected to lead to lower rates of growth in 2018. Despite increasing beef production forecast in Ireland and the UK (AHDB, 2018), the outlook for EU cattle prices is for moderate increases.

Our forecast is that EU and Irish cattle price will be higher in 2017 than in 2017. The increase in Ireland of 3 percent is lower than that forecast for the EU due to growth in Irish beef production expected in 2018. In our forecasts we have assumed that the current (early November 2017) exchange rate between the euro and sterling will prevail through all of 2018.

The forecast higher price of finished cattle is expected to be reflected in higher calf, weanlings and store cattle prices in Ireland. Our forecast is that younger cattle prices in 2018 will increase by 3 percent relative to 2017 levels.

4.2.1 Outlook for Beef Enterprise Net Margins in 2018

Figure 12 compares the estimated and forecast average direct costs per hectare in 2017 and 2018 for the Single Suckling and Cattle Finishing enterprises. With prices for cattle of all ages forecast to increase in 2018, gross output on both Single Suckling and Cattle Finishing enterprises are forecast to improve on the estimated 2017 levels. Despite expenditure on feed forecast to be higher in 2018 and pasture and forage expenditure costs expected to increase slightly, margins earned on both Single Suckling and Cattle Finishing enterprises are forecast to improve on the levels estimated for 2017.

Gross margins for Single Suckling enterprises are forecast to increase by 4 per cent to €455 per hectare. Net margins for the Single Suckling enterprise are also forecast to improve in 2018, with a zero margin per hectare forecast. The forecast increase in prices and output value outweighs the negative impact of forecast higher direct costs of production.

The forecast increase in gross margin per hectare on Cattle Finishing farms in 2018 is 5 percent. For Cattle Finishing enterprises the forecast increase in finished cattle prices in 2018 is partly offset by the impact of higher young cattle prices that cattle finishers pay for cattle purchased in.

The average net margin per hectare for Single Suckling enterprises in 2018 is forecast to be zero, a minor improvement on the negative net margin in 2017. Net margins on average on Cattle Finishing farms are forecast to improve in 2018, with the forecast average positive net margin of €74 per hectare. The forecast average margins earned on
the least, average and most profitable of the Single Suckling and Cattle Finishing enterprises in 2018 are presented in Table A3 and Table A4.

**Figure 12: Estimated Direct Costs for 2017 and Forecast Direct Costs for 2018**

![Diagram showing estimated direct costs for 2017 and forecast direct costs for 2018.](image)

Source: Author’s Estimates 2017 and Forecasts 2018

### 5. Concluding Comments

In 2017 contrasting developments in the economic performance of Cattle Finishing and Single Suckling enterprises were evident. Higher production and higher output prices boosted the value of output and margins on Cattle Finishing farms. On the Single Suckling enterprises, lower direct costs and stable output value led to a small improvement in the margins earned.

In 2017 Irish finished cattle prices increased as a result of stronger cattle prices in the EU. Prices for younger cattle in general were stable. During 2017 lower feed prices and fertiliser prices were offset by increased input usage so that overall costs of production increased marginally relative to 2016. The only marginal rise in costs of production meant that higher output prices on cattle finishing enterprise had a large effect on gross margins.

The estimated gross margins earned in 2017 on Cattle Finishing enterprises have increased relative to 2016. In 2017 we estimate that the net margin earned on the average Single Suckling enterprise is negative and marginally worse than that earned on average in 2016. The estimated average net margin earned on the average Cattle Finishing enterprise in 2017 is positive.

The increase in Irish prices in 2017 was driven by higher EU prices. Our forecast for 2018 is for a further moderate improvement in Irish cattle prices. This outlook is driven by reducing supplies of beef on the EU market and moderate demand growth. Forecast increases in pig and poultry meat prices in the EU will also reduce the tendency for consumers to substitute away from beef and will support the beef share of meat consumption.

Exchange rate developments in 2018 will have a major bearing on the extent to which the Irish price developments diverge from average EU price developments. Given Ireland’s continued dependence on the UK market, a further weakening of sterling in 2018 could lead to an even more pessimistic outcome for Irish cattle prices. However, it should be noted that such a development while negative from an output value perspective would also likely lead to some offsetting decreases in some input prices.

The levels of profit forecast for the Cattle Finishing enterprises are significantly higher than the average over the period 2012-2016. In the case of the Single Suckling enterprises, the levels of profit forecast are also higher than the average of the period 2012-2016. The profitability of the average Single Suckling and Cattle Finishing enterprise, when decoupled direct payments are excluded, has for most of the recent past been negative. On Single suckling enterprises, the farmers’ output value for most years (2015 may have been exceptional) has been less than total costs of production. While the top one third of both Single Suckling and Cattle Finishing enterprise often earn positive net margins, most enterprises are generally failing to cover costs of production with the value of output sold. This on-going lack of profitability reflects the structure of the industry.

The price outlook for beef over the short term is positive but remains acutely uncertain over the medium term. The largest market for Irish beef, the UK, has dramatically reduced in value as a result of changes in exchange rates. There seems little prospect of a return to 70p per euro level that prevailed for much of 2015. The prospect of changes to market access arrangements for Irish beef following a UK exit from the EU will mean that medium term returns from the UK market will decline. The challenge for the Irish beef industry will be to develop new markets for Irish beef that can begin to reduce the dependence on the UK market that has traditionally been Ireland’s second “home” market.
References


DAFM (2017a) Quarterly Summary Report for Feed Usage (Various Issues).


Acknowledgements

The authors would like to thank the staff and recorders of the National Farm Survey, in particular Mr Brian Moran and Mr John Lennon, for their assistance in conducting the analysis contained in this paper, industry contacts that provided valuable feedback on input and output market developments and Agricultural Economics and Farm Surveys Department colleagues who provided valued criticism. Any errors or omissions remain the sole responsibility of the authors.
Table A1: 2016 and Estimated 2017 Financial Performance per hectare: Single Suckling Enterprise

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Source: Teagasc National Farm Survey Single Suckling Enterprise Fact Sheet 2016 (Teagasc NFS, 2017a) and Authors’ Estimates 2017

Table A2: 2016 and Estimated 2017 Financial Performance per hectare: Cattle Finishing Enterprise

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Source: Teagasc National Farm Survey Cattle Finishing Enterprise Fact Sheet 2016 (Teagasc NFS, 2017b) and Authors’ Estimates 2017
Table A3: Forecast 2018 Single Suckling Enterprise Financial Performance per hectare

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Source: Authors’ forecast 2018

Table A4: Forecast 2018 Cattle Finishing Enterprise Financial Performance per hectare

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<th>Average</th>
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<tbody>
<tr>
<td>Gross Output 2018</td>
<td>2,029</td>
<td>1,101</td>
<td>580</td>
<td>1,261</td>
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<tr>
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<td>926</td>
<td>606</td>
<td>425</td>
<td>642</td>
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<tr>
<td>Concentrate Costs</td>
<td>463</td>
<td>287</td>
<td>170</td>
<td>301</td>
</tr>
<tr>
<td>Pasture and Forage Costs</td>
<td>333</td>
<td>242</td>
<td>197</td>
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<td>Other Direct Costs</td>
<td>130</td>
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<td>58</td>
<td>84</td>
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<tr>
<td>Gross Margin 2018</td>
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<td>495</td>
<td>155</td>
<td>619</td>
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<tr>
<td>Overhead Costs 2018</td>
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<td>439</td>
<td>545</td>
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<tr>
<td>Net Margin 2018</td>
<td>363</td>
<td>11</td>
<td>-284</td>
<td>74</td>
</tr>
</tbody>
</table>

Source: Authors’ forecast 2018
Irish Sheep Farming in 2016

Irish Sheep Slaughter
2.892 million head (up 2%)

Irish Lamb Slaughter
2.491 million head (down 1%)

Live Exports
0.048 million head (up 50%)

Irish Ewe Numbers
2.505 million (up 1%)

Stocking Rate
(Mid Season Lowland)
average 7.7 ewes/ha (up 4%)

Weaning Rate
(Mid Season Lowland)
average 1.42 lambs/ewe (up 6%)

Lamb Mortality
(Mid Season Lowland)
average 6%

Lambs Weaned/ ha
(Mid Season Lowland)
average 11 lambs/ha (up 8%)

Lamb price
average €461/100kg (down 2%)

Lamb Carcass per head
average 20.5 kg (up 2%)

Total Production Costs
(Mid Season Lowland)
average €131 per ewe (up 3%)

Total Production Costs
(Mid Season Lowland)
average €998 per hectare (up 10%)

Gross Margin
(Mid Season Lowland)
average €84 per ewe (up 16%)

Net Margin
(Mid Season Lowland)
average €18 per ewe (up 198%)

Source: Teagasc National Farm Survey and Central Statistics Office
ANNUAL REVIEW AND OUTLOOK 2018

Irish Sheep Farming in 2017

- Small increase in prices (up 2%)
- Sheep welfare payment introduced
- Lamb Slaughter up 11%
- Lamb Prices up 2%
- Weather Conditions Average
- Grass Availability Normal
- Fertiliser Prices down 6% on 2016 level
- Fertiliser Use up 2% on the 2016 level
- Feed Prices down 2%
- Feed use up 5%
- Other Direct Costs up 5% on the 2016 level
- Fuel prices up 8% on the 2016 level
- Total Input Costs up 2% on the 2016 level
- Gross Margin per ha (Mid Season Lowland Lamb) €817 (up 27% on the 2016 level)

Source: Teagasc  Estimates for 2017 and Forecasts for 2018

Irish Sheep Farming in 2018

- Lower output prices competition from other meats slows demand growth
- Lamb Slaughter unchanged
- Lamb prices down 3% on 2017 level
- Weather Conditions normal weather assumed
- Grass Availability Similar to 2017
- Fertiliser Prices up 5% on 2017 level
- Fertiliser Use little changed on 2017 level
- Feed Prices up 2%
- Feed use unchanged
- Other Direct Costs up 1% on the 2017 level
- Fuel prices up 3% on the 2017 level
- Total Input Costs up 2% on the 2017 level
- Gross Margin per ha* (Mid Season Lowland Lamb) €767 (down 6% on the 2017 level)

* Margins in 2017 & 2018 benefit from the Sheep Welfare Scheme
Review of Sheep Farming in 2017 and Outlook for 2018
Kevin Hanrahan
Agricultural Economics and Farm Surveys Department, Teagasc

1. Introduction
For this paper, data from farms in the Teagasc National Farm Survey (NFS), which have a mid-season lowland lamb enterprise, are used together with data from the Central Statistics Office (CSO), European Commission DG Agri and Eurostat to analyse the financial performance of Irish sheep farms. Estimates of enterprise margins for 2017 are based on 2016 Teagasc NFS data and CSO price indices for the year to date (CSO, 2017b) and preliminary estimates for 2017 (CSO, 2017c). Forecasts for sheep enterprise margins for 2018 are based on our estimates of margins for 2017, and our forecasts of input and output price and volume changes in 2018.

We begin the paper with a brief review of the outturn for family farm income (FFI) for the Teagasc NFS mainly sheep farms in 2016. A detailed assessment of the 2016 mid-season lowland lamb enterprise margins is then presented in section 3. This is followed by an overview of the current short term outlook for European and Irish sheep markets in section 4. Estimates and forecasts of margins for the lowland mid-season lamb enterprise for 2017 and 2018 are then presented in sections 5 and 6. The mid-season lowland lamb enterprise is the predominant lowland sheep system in Ireland. In our analysis we have limited the sample analysed to those enterprises with more than 20 breeding ewes.

Implementation of the June 2013 CAP reform agreement in Ireland in 2015 led to the incorporation of the Sheep Grassland Scheme’s payment within the decoupled direct payment (the Basic Payment) received by farmers with a sheep enterprise. As a consequence the payment to enterprise output was very low in 2015 and effectively disappeared in 2016. In Budget 2017 €25 m was allocated to a new Sheep Welfare Scheme (DAFM, 2016a). In our analysis we have assumed that this payment, that will paid be on a per ewe basis, will be worth €10 a ewe, which at an average stocking rate of approximately 7 ewes per hectare is equivalent to circa €70 per hectare. This payment is incorporated in estimates of enterprise output for 2017 and forecasts for 2018.

FFI on those farms classified by the Teagasc NFS as mainly sheep farms declined in 2016, with FFI on sheep farms down almost 3 percent on the level earned in 2015. The average FFI earned on these farms for the period 2012 through 2016 are shown in Figure 1.

The decline in FFI on sheep farms in 2016 was not due to a decline in sheep output. The value of sheep and wool output on Irish sheep farms increased marginally in 2016. The mixed nature of most Irish sheep farms means that developments in non-sheep enterprise profitability can significantly affects the income performance of what are classed as sheep system farms. In 2016 the value of cattle and crop output on farm classified by the Teagasc NFS as sheep farms fell. This output value development, rather than developments in the value of lamb output value, was responsible for the deterioration in average farm income on sheep farms.

Figure 1: Average Income on Mainly Sheep Farms in Ireland: 2012 to 2016

Source: 2016 Teagasc National Farm Survey (2017)

In the remainder of this paper we focus exclusively on the mid-season lamb enterprise as the unit of analysis. This allows us to isolate the impact of developments in sheep output prices and related costs of production on profitability of Irish sheep
production. All enterprise margins are exclusive of payments that are decoupled from production. Enterprise margins for mid-season lowland lamb do include coupled payments. In 2017 and 2018 payments to farmers participating in the Irish Government’s Sheep Welfare Scheme will boost the value of gross output and margins per hectare.

**Sheep Margins in 2016**

Changes in the value of output, costs and gross margin per hectare for the mid-season lowland lamb enterprise in 2016 are shown in Table A1 of the Appendix to this paper. The value of gross output for mid-season lamb enterprises in 2016 increased despite lower lamb prices. This improvement in output value (+18%) was due to growth in the volume of lamb produced per hectare. In 2016 both the stocking rate of ewes per hectare and the weaning rate (lambs per ewe) increased, with overall lamb carcass per ha increasing by over 12%.

In 2016 total direct costs per hectare on the average mid-season lamb enterprise increased by 12 percent. This increase was due to increased expenditure on concentrate feed and “other” direct costs. In 2016 fertiliser prices declined and pasture and forage costs in 2016 were unchanged relative to 2015.

Gross margins in 2016 increased relative to 2015, due to growth in output value that outpaced growth in direct costs of production.

The large differences in the profitability of sheep farms operating the mid-season lamb system that have been historically observed continue to persist. In part these differences are reflective of differing agronomic conditions such as differences in soil quality that affect the capacity of some farms to improve their intensity of production, but some of the difference is also likely to be reflective of continuing differences in farm management performance.

For comparison purposes, in Table A2 mid-season lowland lamb enterprises are ranked on the basis of gross margin per hectare, and assigned to three equally sized groups which we have termed least, average and most profitable. The average levels of output, direct costs and gross and net margin per hectare and indicators of technical performance across these three groups can then be compared.

The most profitable one third of mid-season lamb enterprises earned an average gross margin of over €1,000 euro per hectare in 2016, while farms in the bottom group earned an average gross margin of only €269 per hectare. Top producers earned, on average, 4 times more per hectare than their counterparts in the bottom group.

The large differences between the values of output per hectare between the three groups of farms are due to differences in weaning and stocking rates. Higher levels of technical performance are reflected in the average carcass output per hectare of 291 kg on the most profitable mid-season lamb enterprises, versus 163 kg on the least profitable enterprises.

These very large differences in gross margin earned per hectare reflect large differences in intensity of production, but also differences in direct costs per hectare (see Table A2). Total direct costs per hectare are highest on the group with the highest level of profitability reflecting higher stocking rate on these farms, however, the direct costs per hectare on the least profitable third of farms are on average equal to 93% of the direct costs of the most profitable sheep farms.

When direct costs of production per kilo of lamb carcass produced are compared, the impact of different levels of production intensity per hectare can be taken into account. Direct costs of production per kilo of lamb carcass produced on the least profitable farms are 68 percent higher than the costs per kilo incurred on the most profitable of the mid-season lamb enterprises.

With strong growth in gross margin earned in 2016 and only moderate growth in sheep enterprise overhead costs, the average net margins for midseason lamb enterprises increased dramatically in 2016. The average net margin earned on the mid-season lamb enterprises analysed in 2016 was €155 per hectare. This represents a 159% increase on the net margin earned in 2015 of €60 per hectare. As the data in Table A2 show, the large variation in gross margin earned per hectare is also reflected in variation in the net margins earned. The most profitable mid-season lowland lamb enterprises on average earned a net margin of over €491 per hectare while the least profitable lowland lamb enterprises had negative net margins (i.e. losses) of over €150 per hectare.
3. Sheep Meat Markets: Short run outlook

The bulk of Irish sheep meat production is destined for foreign markets. In 2016 over 83 percent of Irish sheep meat production was exported (CSO, 2017d). This means that understanding likely lamb price developments on Ireland’s export markets is critical in assessing the prices that Irish sheep farmers are likely to receive for their output in 2018. The relative prices of competing meats (beef, pig and poultry meat) will also have an impact on demand for Irish lamb, both in Ireland and on export markets, and hence also affect the prices for lamb that Irish sheep farmers receive.

Though continental EU markets account for the majority of Irish lamb exports, the UK market remains important for Irish exports. UK lamb, together with non-EU imports (mostly sourced from New Zealand and Australia), also competes with Irish lamb on Continental EU and UK markets. The UK market in 2017 (year to end of September) accounted for an estimated 26 percent of Irish sheep meat exports as illustrated in Figure 2. As a consequence the depreciation of the pound sterling also had a negative impact on Irish lamb prices.

Aggregate EU demand for lamb contracted in 2016 and is forecast to contract further in 2017 due to lower per capita consumption (EC, 2017). The outlook for the Eurozone macroeconomy in 2018 is positive and economic growth and higher disposable incomes will mean that per capita demand for lamb in 2017 is likely to increase modestly in 2018. This improvement in European demand outlook, combined with developments in EU sheep supply and expected price developments for competing meats will determine the short-run outlook for European (and Irish) lamb prices.

The outlook for the supply of sheep meat within the EU is forecast to be positive in 2017. Growth in heavy lamb output in Ireland and the UK observed in 2017 is forecast to continue into 2018. This growth in output is expected to be sufficient to offset some contraction in production from some continental markets in 2018. Irish ewe numbers, on the basis of the June 2017 CSO livestock survey (CSO, 2017a), are stable, with numbers in 2017 up less than 1% on 2016. Somewhat higher levels of ewe slaughter in 2017, in the context of a stable ewe flock to June 2017 are indicative of a stable or possibly modestly contracting Irish beginning breeding inventory in 2018.

![Figure 2: Irish Sheep and Lamb Meat Exports (Volume) by Destination in 2017](image)

Source: Eurostat COMTRADE database, year to September.

The indigenous production of lamb in the EU in 2018 will largely be a function of the 2017 ending inventory of breeding ewes. Total EU ending inventories of ewes in 2017 are forecast to be slightly higher in 2018. The UK sheep breeding flock in June 2017 was provisionally estimated by DEFRA (2017) to be 2% higher than the equivalent level in 2016. Continental EU inventories of breeding sheep and lambs available for slaughter in 2018 are also likely to be stable with contraction in production in some member states offset by increases in supply from others.

**Beef and Lamb New Zealand** (B&L NZ, 2018) expect New Zealand lamb shipments in 2017/18 to be largely (+0.5 percent on the level in 2016/17) ABARES is forecasting that Australian lamb exports in 2017/18 will increase modestly (+1%). Ongoing flock rebuilding is forecast to limit the magnitude of likely expansion of production in Australia next in 2018.

The EU supply of sheep meat in 2018 is expected to increase. Growth in indigenous EU production will be augmented by growth in EU sheep meat imports. Growth in incomes in the Eurozone is likely to support EU demand for lamb. The outlook for European and Irish lamb prices in 2017 depends on whether the expected expansion EU domestic use of sheep meat is sufficient to absorb the growth in supply likely to arise.

The growth in domestic EU supplies of sheep meat combined with an increase in imports will prices will mean that the price of lamb on Irish and EU markets is likely to decline in 2018. In 2018 the UK
will remain the largest lamb producer in the EU. The UK is Ireland’s principal competitor on the French market. In the event that Brexit developments lead to a further weakening of the pound sterling, further downward pressure on the price Irish exports earn on the French and other EU continental markets could arise in 2018. Our forecast is that lamb prices in 2018 will decline by 3 percent relative to their 2016 level.

4. Estimated Sheep Gross Margins 2017

To obtain an estimate of farm profitability for 2017, it is necessary to estimate the volume and price of inputs likely to have been used in producing lambs, as well the volume and value of the lamb produced. In our estimates for 2017 (and forecasts for 2018) we have assumed that the increase in the volume of spring lamb produced nationally (DAFM 2017b; CSO 2017e) is reflected in improved weaning rates and an increase in stocking rate in 2017. The assumed increase in the intensity of lamb production is reflected in both higher costs of production per hectare and increased levels of gross output per hectare. It is also assumed that in 2017 (and 2018) the Irish Government’s Sheep Welfare Scheme will add approximately €70 per hectare to the value of gross output on the average mid-season lamb enterprise.

Figure 3: Irish Lamb Price, 2002 – 2017

Source: European Commission DG AGRI and author estimate 2017

The EU sheep and lamb market in 2017 was characterised by a strong contraction in the volume of imports (-12%) and growth in indigenous supplies of EU sheep meat (+2.6%). Overall, total supply remained stable in comparison with 2016. Despite the increased competitiveness of UK lamb exports when priced in euro, Irish and EU average prices for the year to date are likely to be circa 2% higher than in 2016.

The overall value of market based gross output per hectare for the mid-season lamb system in 2017 is estimated to have increased strongly (+6%) because of increases in the volume of output per hectare and higher output prices. At a national level the volume of lamb produced in 2017 is over 11% higher than in 2016 (CSO 2017e, DAFM 2017b). While some of this increase in production reflects higher levels of ewe slaughter and the slaughter of hoggets carried over from 2016, there has also been an increase of 5% in spring lamb slaughter (DAFM, 2017b). Our assessment is that output per hectare has increased in 2017 and in our estimates for 2017 we have assumed that the volume of output per hectare has increased by close to 4%.

The main direct costs of production for Irish sheep farms are purchased feed, pasture and forage costs. Overall input costs are estimated to have increased in 2017. While the prices of fertilisers and concentrate feeds have declined in 2017 as compared with 2016. The increase in the volume of output estimated to have occurred in 2017 is associated with increased volumes of both concentrate feeds used and expenditure on pasture and forage production. Overall direct costs per hectare are estimated to have increased by 2 percent in 2017.

Purchased feeds typically account for 40 percent of total direct input expenditure on the average mid-season lowland lamb system. Over the course of 2017 purchased sheep feed prices are estimated to have declined. In 2017 feed use is estimated to have increased relative to 2016 on the basis of the increase in the volume of lambs delivered to factories for slaughter and the higher ewe inventories recorded in the June Survey (CSO, 2017).

Department of Agriculture, Food and the Marine (DAFM) data for the first three quarters of 2017 (DAFM, 2017a) indicate that total sales of sheep feed (excluding exports) were 5% lower in volume terms than in the same period in 2016. It is difficult given the increase in the volume of lambs (and other sheep) delivered for slaughter as well as the increase in total inventories of sheep to account for this reported fall in the volume of sheep feed sales. Rather than assume that reduced sales of sheep feed are reflected in equivalent reductions
in feed use per hectare, we have assumed that feed use per hectare has increased by 2 percent in 2017. Given the lower price of sheep feed in 2017 expenditure on concentrates is estimated to have increased marginally in 2017.

Pasture and forage costs typically account for approximately 30 percent of total direct costs on the mid-season lowland lamb system. Fertiliser prices have declined in 2017, with prices estimated to have fallen by 6 percent in 2017 (CSO, 2017a, 2017b). Fertiliser sales data DAFM indicate that the volume of fertiliser sales in 2017 has increased strongly. However, our assessment is that most of these increased sales have not been to sheep farms. In our estimates for 2017 we have assumed a small increase in the volumes of fertiliser used by mid-season lowland enterprises has occurred in 2017. Contracting charges in 2017 are not thought to have changed, and overall we estimate that expenditure on pasture and forage in 2017 decreased by over 3 percent compared to 2016.

In 2017 total direct costs of production on the mid-season lowland land enterprise are estimated to have remained unchanged in comparison with 2016 with lower spending on pasture and forage offsetting increased spending on other direct inputs. Input prices have, with the exception of farm diesel, been lower in 2017 than in 2016, the increase in output per hectare has led to some increases in input usage. Overhead cost of production have not increased dramatically so that total costs of production on the mid-season lamb enterprise are estimated to have increased by just over 1% compared with 2016.

With marketed output value higher in 2017 due to increased carcass output per hectare and higher lamb prices, and farmers receipt of the circa €70 per hectare from the Sheep Welfare Scheme, the gross margin earned on the average lowland mid-season lamb enterprise in 2017 is estimated to have increased by 21 percent to €779 per hectare (see Table A3). The Sheep Welfare Scheme payment is estimated to have boosted the gross margin increase in 2017. In the absence of this coupled payment the estimated increase in gross margins would have been 10% rather than 21%. Stable overhead costs in 2017 mean that the enterprise net margin on the mid-season lowland lamb enterprise is also estimated to have increased strongly. Average estimated net margin for 2017 is €280 per hectare.

5. Outlook for the Sheep Enterprise Gross Margin in 2018

With increasing indigenous lamb supplies in the EU and increased sheep meat imports from the rest of the world in 2018, Irish and EU prices in 2018 are forecast to decline by 3%. EU demand for lamb is forecast to increase next year, and while some of this growth is due to growing per capita incomes in the Eurozone, the primary driver for increased domestic use in 2018 will be lower lamb prices.

The outlook for input prices in 2018, from the perspective of Irish sheep farmers, is not as positive as in 2017. The Prices of the key inputs to sheep production are forecast to increase though the magnitude of the increases is likely to be relatively modest.

Concentrate costs are the largest direct cost item for mid-season lowland lamb enterprises and prices of concentrates are forecast to increase by 2% in 2018. The volume of feed use is forecast to be unchanged in 2018 relative to 2017. Total expenditure on concentrates is expected to increase by 2%.

The price of fertiliser is also forecast to increase in 2018. Despite energy price inflation forecast for 2018, contractor charges are not expected to increase in 2017. Overall, pasture and forage costs on Irish lowland mid-season lamb enterprises are forecast to increase by close 5 percent in 2018.

Table A3 summarises our forecasts of output, costs and margins for the mid-season lamb enterprise for 2018. Given the negative outlook for lamb prices in 2018, and the forecast increase in direct costs of production, the average gross margin earned from sheep farming is expected to decline in 2018. The gross margin per hectare for the mid-season lamb system in 2018 is forecast to be €731, a 6 percent decrease on our 2017 estimate. In both 2017 and 2018 margins earned on the midseason lowland enterprises will be boosted significantly by the receipt of the coupled Sheep Welfare Scheme payment.

On the basis of future contract prices for crude oil, fuel costs are expected to increase in 2018. With other overhead costs forecast to increase moderately, total overhead costs for average mid-season lamb enterprises is forecast to increase by 1.5%.
Because of increases in input prices in 2018, total costs of production are expected to be circa 2% higher in 2018 than in 2017. With lower output value expected due to the forecast decline in lamb prices, net margins per hectare from sheep production are forecast to decline by 20% to €224 per hectare in 2018.

6. Concluding Comments

The average gross margin earned by mid-season lamb producers in 2017 is estimated to have increased strongly compared to that earned in 2016. Stronger lamb prices and increased output volume per hectare, and stable to lower input prices boosted margins. National policy, the Sheep Welfare Scheme, is estimated to have augmented what would have already been a good year for sheep margins.

Sheep output prices in 2018 are likely to be lower than those in 2017. Growth in EU lamb supplies and increased imports of lamb into the EU in 2018 will require that EU lamb prices decline so as to stimulate growth in consumption. Our forecast is that 2018 Irish and EU prices will be 3% lower than in 2017. Any further weakening of the UK pound euro exchange rate in 2018 would add further to the negative sentiment regarding EU and Irish lamb prices.

Our forecast is that gross margins earned by the average mid-season lamb enterprise in 2018, as a result of the negative price outlook in Ireland, will decline relative to those estimated for 2017. The forecast gross margin for 2018 is €731 per hectare, a 6 percent decrease from the estimated gross margin for 2017. Average net margins are also forecast to decline, with the average mid-season lamb enterprise forecast to earn a net margin of €224 per hectare in 2018 that is 20% lower than that estimated for 2017.

References


DAFM (2017a) Quarterly Summary Report for Feed Usage (Various Issues).

DEFRA (2017) “Farming Statistics: Provisional crop areas, yields and livestock populations at June 2017 - United Kingdom.” Available to download at


Eurostat (2017b) COMTRADE Database, Theme 6, External Trade. Go to epp.eurostat.ec.europa.eu.


Acknowledgements

The author would like to thank the staff and recorders of the National Farm Survey for their assistance in conducting the analysis contained in this paper, industry contacts who provided valuable feedback on input market developments and Agricultural Economics and Farm Surveys Department colleagues who provided valued criticism. Any errors or omissions remain the sole responsibility of the author.
### Table A1: Average Mid-Season Lamb Output, Direct Costs, Gross Margin and Technical Performance

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<th>2017e</th>
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<tr>
<td></td>
<td>(€/ha)</td>
<td>(€/ha)</td>
</tr>
<tr>
<td>Coupled Payments</td>
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<td>(Sheep Grassland/Sheep</td>
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<tr>
<td>Welfare)</td>
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<td><strong>Pasture and Forage costs</strong></td>
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<tr>
<td><strong>Ewes/ha</strong></td>
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<td><strong>Lambs per ewe</strong></td>
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<tr>
<td><strong>Lamb Carcass (kg)/ha</strong></td>
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Source: Teagasc National Farm Survey and Authors’ estimates for 2016
Note: In calculating the volume of lamb carcass output per hectare an average carcass weight of 20 kg has been used (Hanrahan, 2006)

### Table A2: Mid-Season Lamb Output, Costs, Margins and Technical Performance in 2016 by gross margin grouping

<table>
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<th>Most Profitable</th>
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<th>Least Profitable</th>
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<td><strong>Gross Margin</strong></td>
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<td><strong>Net Margin</strong></td>
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<tr>
<td><strong>Ewe/ha</strong></td>
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<td>Lambs/ewe</td>
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<td>Lamb carcass (kg)/ha</td>
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<td>Dir. costs €/kg carcass</td>
<td>1.87</td>
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<td>3.19</td>
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Source: Teagasc National Farm Survey
Note: In calculating the volume of lamb carcass output per hectare an average carcass weight of 20 kg has been used (Hanrahan, 2006).
## Table A3: Average Mid-Season Lamb Enterprise Costs, Output, Gross and Net Margin, 2016 – 2018

<table>
<thead>
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<th>2016</th>
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<th>2018f</th>
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<td>Pasture and Forage</td>
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<td>Other Direct Costs</td>
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<td>139</td>
<td>141</td>
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<tr>
<td><strong>Gross Output</strong></td>
<td>1,133</td>
<td>1,270</td>
<td>1,234</td>
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<tr>
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<td>70</td>
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<td><strong>Net Margin</strong></td>
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<td>280</td>
<td>224</td>
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Source: Teagasc National Farm Survey. * Estimate, f Forecast
## Irish Cereal Farming in 2016

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<th>Category</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irish Cereal Production</td>
<td>2.311 million tonnes (down 12%)</td>
</tr>
<tr>
<td>Irish Cereal Area</td>
<td>280,300 ha (down 4%)</td>
</tr>
<tr>
<td>Irish Barley Area</td>
<td>189,200 ha (down 7%)</td>
</tr>
<tr>
<td>Irish Wheat Area</td>
<td>67,900 ha (up 4%)</td>
</tr>
<tr>
<td>Spring Barley price</td>
<td>€141 per tonne (down 5%)</td>
</tr>
<tr>
<td>Winter Wheat price</td>
<td>€149 per tonne (down 10%)</td>
</tr>
<tr>
<td>Spring Barley Yield per ha</td>
<td>7.3 tonnes (down 5%)</td>
</tr>
<tr>
<td>Winter Wheat Yield per ha</td>
<td>9.7 tonnes (down 12%)</td>
</tr>
<tr>
<td>Total Production Cost per ha Spring</td>
<td>€1,109 (down 3%)</td>
</tr>
<tr>
<td>Total Production Cost per ha Winter</td>
<td>€1,380 (down 11%)</td>
</tr>
<tr>
<td>Net Margin for Spring Barley</td>
<td>€86 per hectare</td>
</tr>
<tr>
<td>Net Margin for Winter Wheat</td>
<td>€72 per hectare</td>
</tr>
<tr>
<td>Target Yield for Spring Barley</td>
<td>7.4 tonnes per hectare achieved on 36% of farms</td>
</tr>
<tr>
<td>Target Yields for Winter Wheat</td>
<td>10.2 tonnes per hectare achieved on 30% of farms</td>
</tr>
<tr>
<td>Gross Margin Target Spring Barley</td>
<td>€540 per hectare achieved on 26% of farms</td>
</tr>
<tr>
<td>Gross Margin Target Winter Wheat</td>
<td>€860 per hectare achieved on 32% of farms</td>
</tr>
</tbody>
</table>

Source: Teagasc National Farm Survey and Central Statistics Office
Irish Cereal Farming in 2017

- Good Global Cereal Harvest
- But global stocks now slightly lower

- Irish Cereal Yields
  - up 9% for winter wheat and
  - 7% for s. barley vs. 2016 level

- Barley and Wheat prices
  - up on 2016 level

- Weather Conditions
  - Unfavorable in N. East and West at harvest time

- Fertiliser Prices
  - down 10% on 2016 level

- Fertiliser Use
  - up slightly on 2016 level

- Seed Prices
  - unchanged on the 2016 level

- Other Direct Costs
  - down 1% on the 2016 level

- Fuel prices
  - up 8% on the 2016 level

- Total Direct Costs
  - Overall, input costs slightly lower than in 2016

- Gross Margin (Spring Barley)
  - up €200 per ha on the 2016 level

- Net Margin (Average Cereal Enterprise)
  - €50 per ha

Source: Teagasc Estimates for 2017 and Forecasts for 2018

Irish Cereal Farming in 2018

- Lower Global Cereal Production
  - reversion of yields to normal levels

- Irish Cereal Yields
  - down 1% for w. wheat and down
  - 3% for s. barley vs. 2017 level

- Cereal prices
  - up 7% on the 2017 level

- Weather Conditions
  - Normal weather assumed

- Fertiliser Prices
  - up 6% on 2017 level

- Fertiliser Use
  - little changed on 2017 level

- Seed Prices
  - up 2% on the 2017 level

- Other Direct Costs
  - up 1% on the 2017 level

- Fuel prices
  - up 3% on the 2017 level

- Total Direct Costs
  - Overall, input costs to decrease slightly on 2017 level

- Gross Margin (Spring Barley)
  - unchanged on the 2017 level

- Net Margin (Average Cereal Enterprise)
  - €75 per ha
1. Introduction
Harvest prices in the cereals sector in 2017 were generally higher than those achieved in 2016. In addition yields for the majority of Irish cereal crops were slightly higher than those achieved at harvest 2016. Straw prices were also generally higher in 2017 than those received in 2016. Taken together these developments resulted in higher gross output value in 2017 than in 2016. There were also some cost reductions in 2017, with some direct costs decreasing slightly.

The slight upward movement in cereal prices in 2017 was associated with several factors, the most important of which was a slight decrease in the production estimates for some crops in key producing countries. Slightly lower production globally resulted in a slight decrease in stocks and a slightly more constrained global supply and demand balance in 2017/18.

This paper will consider whether the price increases of the 2017 harvest can be considered atypical or whether prices will continue at these levels into the 2018 harvest. The paper uses Irish Teagasc National Farm Survey (NFS) data to conduct a review of the financial performance of tillage farms in 2016. Following this, prices and costs are estimated for 2017 and these are used to produce an estimate of net margin for the 2017 harvest year. In the concluding sections of the paper, forecasts for 2018 are presented.

Approximately 5,500 mainly tillage farms were represented by the NFS in 2016. Income on tillage farms decreased by 10 per cent on the 2015 level. Market based gross output on a whole farm basis declined by 10 percent, while direct payments increased by 8 per cent. Overhead costs increased on a whole farm basis, but on a per hectare basis declined by 2 per cent, as expenditure on fuel, a relatively important input for tillage farms, fell by 11 per cent. These changes resulted in an average family farm income (FFI) in 2016 of €30,840 which is equivalent to a 10 percent decrease on the average FFI on tillage farms over the previous five year average.

Figure 1: Average Income on Irish Specialist Tillage Farms 2011o 2016

Source: Teagasc, National Farm Survey (various years)

To understand the economic performance of tillage farms in 2016, we begin with a review of the cost and return structure of the main cereal crops using NFS data. Figure 2 disaggregates the direct costs of production for the principal cereal crops grown on Irish farms.

Figure 2: Composition of Direct Costs for Cereal Crops, 2016

Source: Teagasc, National Farm Survey

Figure 2 shows that in general, direct costs are higher for winter sown crops compared to spring sown crops, due to the higher fertiliser and crop protection costs incurred in growing winter crops. However, given that yields are generally higher in winter sown crops, the more appropriate comparative economic indicator is gross margin per hectare which is shown in Figure 3.
Figure 3: Gross Margins per ha for Cereal Crops, 2016

Source: Teagasc, National Farm Survey Data

Figure 3 shows that the average gross margin per hectare for all winter crops is higher than the gross margin for equivalent spring sown crops. Winter wheat and winter oats recorded the highest gross margins and spring barley the lowest margin of all cereal crops examined in 2016 (see Table A1 in the appendix to this paper for further details). The gross margin for the two main cereal crops, spring barley and winter wheat decreased in 2016 relative to 2015, by up to 30 per cent.

While gross margin estimates are useful for comparative purposes, it is also worthwhile to examine the shift in net margin over time. However, for cereal crops it is particularly difficult to allocate overhead costs and straw output to individual crops using NFS data. For this reason, the net margin of the cereal enterprise of the entire specialist tillage farming population within the NFS is examined, and this is shown in Figure 4.

To examine the variation in net margins earned by tillage farms the sample was classified into three groups. Farms were classified on the basis of net margin per hectare; the best performing one third of farms are labelled high margin, the middle one third are moderate margin and the poorest performing one third of tillage farms are classified as low margin. The variation in margins across Irish tillage farms is readily apparent from Figure 4. The net margin for the cereal enterprise per hectare on high margin farms in 2016 was €293 per hectare compared to €98 on moderate margin farms and -€395 per hectare on low margin farms. It is important to remember that these margins include production output only; hence by definition the Single Farm Payment (SFP), which is decoupled from production, is not included in these figures.

Figure 4: Cereal Enterprise on Specialist Tillage System Farms: Net Margin Distributions, 2016

Source: Teagasc, National Farm Survey Data

3. Estimate of 2017 Performance

This section of the paper presents a review of the cereal sector in 2017. To provide an estimate of enterprise margins for the current year, it is necessary to estimate the volume and price of inputs that are likely to have been used as well the volume and value of outputs produced in 2017. The ensuing sections of the paper discuss first, the movements in input prices and usage and second, the cereal market conditions, harvest yields, and production in 2017.

3.1 Estimated Input Usage and Price 2017

3.1.1 Fertiliser – Usage and Price 2017

In the early half of the last decade fertiliser costs typically comprised about 25 per cent of direct costs and just over 10 per cent of total costs on tillage farms. However, as illustrated in Figure 5, fertiliser types commonly used on tillage farms have increased substantially in price since 2006. The price increases in recent years have meant that expenditure on fertilisers now represents a larger proportion of costs on tillage farms than previously, albeit with some decline in recent years; in 2016 fertiliser costs represented about 35 per cent of direct costs on tillage farms and around 17 per cent of total costs. In particular the price of natural gas which is a key determinant of fertiliser price, was the major driving force behind the upward trend for fertiliser prices through the
second half of the 2000s. Increased demand and relatively fixed production capacity was also a factor.

However, following the peak in 2008 and 2009, the pressure on fertiliser prices has been mixed in more recent years, but with significant downward pressure on prices arising in 2017, for tillage farms in particular, where seasonality of purchase and application has an influence on overall expenditure for tillage farms. On a calendar year basis, for winter sown cereal crops, straight nitrogen based fertiliser products are estimated to be down by about 17 per cent whereas P & K fertiliser products are estimated to be down by 10 per cent, in 2017 compared to 2016. It is estimated here that for the 2016/17 harvest year, in aggregate NPK fertiliser prices were down by about 12 per cent for winter cereal crops, whereas spring crop compounds were down by about 4 per cent, with differences due to seasonality of purchases.

**Figure 5: Irish Farm Gate Price Index of Fertilisers 2006 to 2017**

On the usage side, DAFM figures indicate that fertiliser purchases in the 2017 fertiliser year (October 2016/September 2017) were up on those recorded for the previous year. Given that the DAFM figure on fertiliser purchases refers to all fertiliser purchases for grassland and cropland it was necessary to consult with farm advisors and industry sources to evaluate the magnitude of change in fertiliser usage levels for Irish crop farms. Reports from a number of sources indicate that fertiliser usage per hectare in 2017 could have increased marginally compared to 2016, due to potential for increased fertiliser use on leased land. Hence, in per hectare terms (per crop) it is estimated that 2017 usage of fertiliser was marginally up on that applied in 2016. With a slight increase in fertiliser usage on crop farms (per hectare) in 2017 and downward movement in fertiliser prices, overall expenditure per hectare on fertiliser in 2017 is estimated to have decreased compared to the relative expenditure change on grassland farms.

### 3.1.2 Seed – Usage and Price 2017

Expenditure on purchased seed on crop farms comprises between 11 and 18 per cent of direct costs for cereal production. In terms of the composition of total costs, seed represented 6 per cent of total costs in 2016. In 2017, cereal farmers did not experience any major shift in seed costs relative to the previous year due to little movement in the prices for the main cereals at harvest 2016. In Autumn 2016 when seed supplies were purchased for the 2017 harvested winter crops, blue label seed costs were trading at about €500 per tonne. This price was also evident in 2017 for spring sown crops.

### 3.1.3 Crop protection – Usage and Price 2017

The expenditure on crop protection by specialist tillage farms in 2016 accounted for 24 per cent of direct costs and 12 per cent of total costs. However, the contribution of crop protection to the composition of costs can vary significantly depending on the crop; the percentage spent on crop protection for winter crops is higher than that for spring crops. For example for the winter wheat crop in 2016, crop protection costs accounted for 32 per cent of direct costs as compared to 28 per cent for spring barley.
Compared to other significant costs on tillage farms, the increase in the prices of crop protection products listed by the CSO has been limited over the recent past. Figure 6 shows that the increase in the costs of crop protection products from 2005 to 2017 was approximately 5 per cent and that between 2016 and 2017 costs are estimated to have increased by about 2 per cent.

### Figure 6: Price Index of Plant Protection products in Ireland 2005 - 2017

![Price Index of Plant Protection products in Ireland 2005 - 2017](source: Central Statistics Office and Author’s own estimates)

**3.1.4 Energy and Fuel – Usage and Price 2017**

Energy and fuel are important inputs in crop production. Given that a number of direct and overhead costs are directly influenced by energy and fuel prices the trend in energy prices is of significance for tillage farmers. In this analysis it is assumed that hired machinery and transport costs, which are a component of direct costs, and fuel and lubricants which are components of overhead costs, are directly influenced by energy inflation. These cost items represented approximately 13 per cent of total costs on tillage farms in 2016.

Based on the CSO estimates presented in Figure 7, the farm level price of fuel has increased by over 12 per cent between 2005 and 2016 (the last full year for which data is available). Between 2016 and 2017 as a result of a large increase in Brent crude oil prices, and only a slight movement in US dollar to Euro exchange rate, the overall story for fuel prices paid by Irish tillage farmers in 2017 is an 8 per cent increase relative to 2016. This is the first sign of an increase in oil prices following a decline in three consecutive years previously. This estimate is based on a comparison of the agricultural motor fuel index from the CSO for 2016 and the first nine months of 2017. For winter and spring sown crops the decrease in energy prices is estimated at around 8 per cent. Demand for these input items tends to be relatively inelastic with respect to price and therefore it is assumed that usage in 2017 will similar to the 2016 level. Overall expenditure on fuel related items is likely to be 8 per cent higher in 2017 relative to 2016.

**Figure 7: Price Index of Fuel products in Ireland 2005 – 2017**

![Price Index of Fuel products in Ireland 2005 – 2017](source: Central Statistics Office and Author’s own estimates)

### 3.1.5 All other direct and overhead costs – Usage and Price 2017

Based on CSO estimates for the first nine months of 2017 compared to the same time period in 2016 it is assumed that ‘other direct costs’ within agriculture have decreased by 1 per cent.

The average cost of land rental in 2016 on specialist tillage farms represented 9 per cent of total costs. Despite the fact that farm gate cereal prices declined slightly in 2016 there was anecdotal evidence that land rents per hectare increased again in 2017 relative to 2016. While the convention is to assume that land rental prices react strongly to changes in cereal prices, NFS data indicates that cereal price inflation/deflation is not translated in its entirety into land rental charges. Hence, despite the slight decline in cereal prices in 2016, it is assumed that the average land rental per hectare increased by about 5 per cent in 2017. Much of this inflation in rental prices per hectare in 2017 can be attributed to the need to maintain hectares to claim direct payments and demand for additional land from the dairy sector in particular. The methods employed here reflecting costs per crop hectare do not allow for changes in the volume of land rented, and any changes on a total...
farm basis will only be fully reflected in the final Teagasc, NFS figures for 2017.

3.1.6 Estimate of Total Input expenditure for 2017

Total expenditure on all input items is estimated to have decreased in 2017 relative to 2016, probably slightly more than that witnessed on grassland farms, due to seasonality of purchases, particularly for fertiliser. The most significant decrease in expenditure occurred on fertiliser, which are estimated to have decreased by about 10 per cent between 2016 and 2017, for winter cereal crops. On average, however the estimated decrease in total direct costs was approximately 3 per cent in 2017 relative to the 2016 level.

Figure 8A: Direct Costs in Winter Cereal Crops on in Ireland 2016 and Estimates for 2017

Source: Teagasc, National Farm Survey Data and Author’s estimate for 2017.

3.2 Estimated Output Values 2017

3.2.1 Price, yield and moisture levels in 2017

Unprecedented volatility has been witnessed in cereal prices in Ireland since 2006, with prices reaching a historical high in nominal terms in 2012. In 2013 and again in 2014, year on year farm gate cereal prices decreased considerably. However, since 2015, there has not been as much movement in cereal prices, with prices increasing slightly and decreasing slightly in other years. In 2017 ensuing from slightly lower stock levels internationally, and some top up loyalty payments from Irish processors, farm gate feed wheat, barley and oat prices at 20 per cent moisture (paid at harvest time) were up slightly on 2016 levels (as shown in Figure 9). Across most major crops it is estimated that on account harvest prices for cereals in 2017 were up by about 10 per cent on 2016 levels, with merchants in some cases paying loyalty bonuses to customers based on minimum purchase levels.

Figure 9: Farm Gate Cereal Prices (major crops), 2000-2017

Source: Teagasc, National Farm Survey Data and Author’s estimate for 2017.

While the majority of cereals in Ireland are still sold off farm at harvest time to a grain merchant on a green moisture basis, the ability of farmers to forward sell grain has introduced an additional element to the calculation of the average price received by farmers. For the past number of years the Teagasc NFS has collected data on the proportion of cereals forward sold before harvest. This research indicates that the majority of cereals are not forward sold before harvest but are sold at harvest time, on a green moisture basis. In 2016, the NFS recorded that approximately 13 per cent of total cereal production was forward sold by farmers prior to harvest. Hence, it is assumed that in 2017 just over 10 per cent of total cereals were forward sold.
Market data shows that, on average, those farmers that forward sold in 2017 did not receive significantly higher market prices than those that waited until harvest time to agree a price. However, as noted earlier, it is estimated that the number of farmers engaged in forward contracting in 2017 was still a relatively small proportion of total production.

Table 1: Average Yields Levels, 2016 and 2017

<table>
<thead>
<tr>
<th>Harvest</th>
<th>Yield (tonne per ha.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Winter Wheat</td>
<td>9.5</td>
</tr>
<tr>
<td>Winter Barley</td>
<td>8.6</td>
</tr>
<tr>
<td>Winter Oats</td>
<td>8.3</td>
</tr>
<tr>
<td>Spring Wheat</td>
<td>8.0</td>
</tr>
<tr>
<td>Spring Barley</td>
<td>7.3</td>
</tr>
<tr>
<td>Spring Oats</td>
<td>7.3</td>
</tr>
</tbody>
</table>

Table 1 shows the average green yields obtained in 2016 and 2017. In general, for the 2017 harvested crops the yields are estimated to be higher than 2016. Grain quality was reported as good with few hectolitre weight problems recorded. Weather conditions in some regions were unfavourable at harvest. However, for all of the major crops, yields in 2017 were above 2016 levels. However, readers should note that these yields are green yields and are not adjusted for moisture content.

The last variable which must be assessed in calculating cereal output value per hectare is the value of straw. Following a decrease in straw stocks over the past number of years, the demand for straw in 2017 has increased significantly, which has had a very positive effect on straw prices. Early harvested cereal crops did not benefit to a large extent from straw price increases, but later harvest cereal crops such as spring barley, winter wheat and winter oats all benefited from very significant price increases over those recorded for 2016. Since harvest time there have been further reports of price increases but how much of that will be translated into farm income is hard to say at this point, with a lot of straw sold off the field at harvest time. Taking yield and price into account, it is estimated that straw returns in 2017 were up on average 30 per cent compared to 2016.

3.2.2 Estimate of Total Output Value for 2017

Given the large number of variables that need to be considered in estimating output value, as outlined above, the estimated changes in crop output value between 2016 and 2017 are very crop specific. However, in overall terms, the general trend has been an increase in output value in 2017 relative to 2016. This increase arises due to the increases in cereal prices, yields and straw value. Output value per hectare in 2017 is estimated to have increased by between 11 and 22 per cent depending on the crop examined.

3.2.3 Estimate of Total Production 2017

The figures presented in section 3.2.2 provide estimates of output value per hectare. However, these estimates do not take into consideration changes in area devoted to cereal crops in 2017. Figure 11 shows the area estimates for 2017 based on Teagasc Harvest Report data (forthcoming December 2017).

Figure 11 shows that the total area devoted to cereal production decreased by 5.2 per cent in the 2016/17 crop year compared to the 2015/16 crop year. There was also some switching between winter and spring sown crops which was weather related.

Table 2 combines actual total cereal production for 2016, as reported by the CSO, with estimated total cereal production for 2017. The estimated 2017 production of wheat, barley and oats is based on
2017 yield estimates from the Teagasc harvest report. Overall cereal production is estimated to up very slightly by approximately 27,000 tonnes or 1 per cent on 2016 levels.

Figure 11: Change in Irish Crop Area from 2015/2016 to 2016/17 crop year in Ireland

<table>
<thead>
<tr>
<th>Cereal</th>
<th>2016 (000 Tonnes)</th>
<th>2017 (000 Tonnes)</th>
<th>%Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td>626</td>
<td>658</td>
<td>105%</td>
</tr>
<tr>
<td>Barley</td>
<td>1464</td>
<td>1442</td>
<td>99%</td>
</tr>
<tr>
<td>Oats</td>
<td>180</td>
<td>198</td>
<td>110%</td>
</tr>
<tr>
<td>Total</td>
<td>2271</td>
<td>2298</td>
<td>101%</td>
</tr>
</tbody>
</table>

Source: CSO and Teagasc, Teagasc Final Harvest Report 2017

Table 2: Actual & Estimated Production 2016 & 2017

Figure 12: Actual Gross Margin in 2016 & Estimated Gross Margin for 2017 for each of the Main Cereal Crops

Source: Teagasc, National Farm Survey Data and Author’s estimates for 2017

Figure 12 shows a clear story in terms of the change in gross margin in 2017 relative to 2016. The relative shift in yields, crop prices and straw returns has been positive between 2016 and 2017. In addition, slight decreases in total direct costs have resulted in an upward movement in gross margins for all cereal crops in 2017. In terms of the major crops, the gross margin for spring barley and winter barley are estimated to be up by about €200 per hectare, while the margin for winter wheat is estimated to be up by over €300 per hectare. It should be noted that the average gross margin figures presented above are market based gross margins and therefore exclude all decoupled payments and do not include overhead costs.

The estimated net margins for 2017 are presented for the average cereal enterprise on specialist tillage farms, with the NFS sample disaggregated into one-third groupings based on net margins per hectare obtained.

3.2.4 International Production Estimates for 2017

While production estimates for Irish cereals are important from a national supply, demand and balance sheet perspective, it is primarily developments in the international supply and use balance for cereals that affect price developments in Ireland. For this reason a review of the international ending stocks for cereals is more informative when near term price developments are concerned. The IGC and Strategie Grains estimates (Strategie Grains, November 2017) show that global total grain production and carry out stocks for 2017/18 marketing year to be down on the previous year’s levels.

3.3 Review of Tillage Enterprise Margins in 2017

The review of cereal output value showed that the average value of output received by farmers was higher in 2017 compared to 2016. The review of input costs concluded that total direct costs were slightly down in 2017 compared to 2016, due mainly to a decline in fertiliser prices, and little movement in other direct cost components. Figure 12 presents the effect of these estimates on the estimated gross margin for each of the main Irish cereal crops.
Figure 13: Actual Net Margin 2016 and Estimated Net Margin for 2017 for the Cereal Enterprise on Specialist Tillage Farms

Source: Teagasc, National Farm Survey Data and Author’s estimates for 2017

Figure 13 shows the cereal enterprise net margin estimates for 2017 relative to 2016, for the average specialist tillage farm, in addition to the net margins for the low, moderate and high margin groupings of tillage farms.

The estimate of net margins for the typical cereal enterprise in 2017 is higher than in 2016 given upward movement in gross margins per hectare and less significant upward movement in overhead costs. For the best performing one-third of tillage farmers the estimated net margin for 2017 was €575 per hectare, and for the moderate margin farmer the net margin was only slightly positive at €50 per hectare. It is important to remember that these figures exclude direct payments. Furthermore, it is important to note that owing to the methods employed in this estimation, changes in cropping choice or area cannot be fully captured and will only be realised when the final Teagasc, NFS figures are available for 2017.

4. Outlook for 2018

In this section forecasts are provided for the expenditure for various input items in 2018, the likely farm gate cereal price that will prevail at harvest 2018 and the likely net margin of tillage farmers in 2018.

4.1 The Outlook for Input Expenditure

4.1.1 Fertiliser – usage and price 2018

A number of factors need to be considered when forecasting price and volume changes for fertiliser on crop farms for 2018. CSO official monthly price indices for fertilisers for 2017 are only available up until the end of September. Market report data coming from the fertiliser industry at present does not point to any major movements in stock balances in 2018. However, there are some market sources indicating that the price of N based products in particular could move off the prices observed at the end of September 2017 due to price pressure from the supply side and energy costs. Taking all of these issues into account, including seasonality of purchases, this is forecast to translate into approximately a 5 per cent increase in fertiliser price for cereal crops in 2017/18.

Fertiliser usage in 2018 could also be expected to increase slightly due to increased yields in 2017 for most crops, resulting in increased fertiliser demand associated with replenishing nutrient off-takes. Overall, it can be expected that fertiliser expenditure will be about 5 per cent higher per hectare on cereal farms in 2018 relative to the 2017 level.

4.1.2 Seed – usage and price 2018

As mentioned previously in the paper, cereal farmers experienced no change in seed costs in 2017 relative to the previous year due to the static prices in the cereal markets. Given that cereal prices at harvest increased slightly in 2017 relative to 2016, this price increase has been transmitted to seed prices, with blue label seed costing around €510 per tonne for 2017, which is about 2 per cent higher than 2017 prices.

4.1.3 Crop protection – usage and price 2018

The increase in crop protection costs in 2018 relative to 2017 is forecast to be of a similar magnitude to the changes seen in each of the last three or four years. Price changes have been minimal, at about 2 per cent per year. Taking volume and price changes into account, based on recent data from the Teagasc, NFS, a 2 per cent increase in crop protection expenditure is forecast for 2018.

4.1.4 Energy and Fuel – usage and price 2018

Fuel costs in 2018 will depend mainly on the evolution of crude oil prices. Current crude oil futures prices suggest that prices will increase from the 2017 average during the course of 2018 by about 6 per cent in Euro terms. Assuming that
usage is unchanged, expenditure on fuel related charges are forecast to increase by about 3 per cent in 2018, given that full price transmission is not witnessed due to taxes and various other supply chain issues. Contractor charges are expected to remain similar to those experienced in 2017.

4.1.5 All other direct and overhead costs 2018

All other direct costs are expected to increase by a very small amount, in line with recent price changes of such items, at about 1 per cent.

In terms of land rental prices for 2018, it is difficult to foresee how any upward movement in prices could be borne with prevailing cereal margins. As in previous years, anecdotal evidence is mixed regarding rental prices this early in the season. A forecast 5 per cent increase has been assumed for 2018. This increase in land rental prices can be attributed mainly to competitive pressure from non-cereal uses, dairy farming in particular. Hence, for 2018 it is assumed that land rental prices will increase by 5 per cent.

4.2 The Outlook for Markets 2018

The cereals market has experienced significant volatility in recent years. Planting decisions by farmers will be influenced by expected farm gate cereal prices (and margins) in 2018. A number of factors must be taken into consideration when making price forecasts for the coming harvest.

To formally evaluate the risk associated with predicting the 2018 harvest price an econometric analysis was conducted to predict the probability that the 2018 farm gate price will be higher or lower than the 2017 price. This analysis was based on the November 2017 LiFEE and MATIFF futures prices for November 2018 contracts. The regression analysis examined the historic relationship between (i) predicted futures price for the following harvest, made from the previous November/December when planting decisions were been made, and (ii) the actual farm gate price paid at harvest one year hence. This regression analysis enables a forecast to be made of the 2018 Irish farm gate cereal price for wheat, taking into consideration the differences between the historic predicted values and the actual outcomes.

Figure 14 outlines the probability of achieving various harvest prices in September 2018. Based on the econometric model developed, it shows that there is significant uncertainty concerning the predicted harvest price for September 2018. This predicted range is based on current futures trading prices (November 2017), and the spread around the mean value is based on how right or wrong futures markets have been in recent times in predicting prices one season ahead.

Based on the probabilities of achieving different harvest prices, the average predicted value from the model for the farm gate wheat price is approximately €157 per tonne at 20 per cent moisture, which is about a 7 per cent increase over harvest prices paid in 2017. However, there is significant variation surrounding this figure and based on a 90 percent confidence interval, it is forecast that the figure could be as low as €120 per tonne or as high as €252 per tonne (Figure 15).

Various market reports have been examined to provide the rationale for the forecast increase in cereal prices for 2018. The latest edition of Strategie Grains (November 2017) forecasts a decline in acreage for soft wheat and maize due to continued crop poor profitability and poor sowing conditions for soft wheat in Northern Europe. Soft wheat area is projected to decline to 25.3 Mha and grain maize to fall to 8.5 Mha in the 2018/19 marketing year. Durum wheat is expected almost flat at 2.79Mha. Barley on the other hand is expected to increase slightly as a result of the difficult sowing conditions for winter cereals in North Europe and relatively favourable prices for barley. However, this switch to spring barley will have a consequence for total cereal yield for the full marketing year.
The change in cereal area (in the EU) is coupled with an assumption of achievement of trend yields in 2018 (seen Appendix A3 for further details on forecast changes in arable crop areas in the EU28 for 2018/19). An achievement of trend yields internationally, ceteris paribus, is assumed to have a slightly positive impact on price given the bumper harvest achievement internationally in 2017. This assumption of course ignores a lot of other variables which potentially could have an impact on price, namely significant exchange rate movements and significant changes in demand from feed and food sources. It is still very early to forecast what might happen to these additional variables and futures markets trend to move closely in line with first production estimates and exchange rate predictions at this time of the year. Based on the futures market forecast and the adjustments made in the regression analysis for predicted versus actual outcomes, our forecast is that farm gate cereal prices will increase by about 7 per cent in 2018.

### 4.3 The Outlook for Tillage Enterprise Margin in 2018

Direct costs are forecast to be slightly higher in 2018 relative to 2017, due to the forecast increase in fertiliser expenditure, seed costs and fuel costs in 2018. Whilst all other direct costs of production (crop protection, machinery hire and other direct costs) are forecast to remain the same or increase slightly, overall direct costs should be higher than 2017 levels. Furthermore, output value on average is forecast to be slightly higher in 2018 for most crops due to only slight yield changes and slight output price increases. The story on yields is slightly mixed, with some crops increasing in forecast yields and other decreasing when 3 year trend yields are assumed. However, the forecast slight increase in output price is expected to negate any negative effect of downward movement in yields. Figure 16 presents the actual gross margin for each of the main cereal crops in 2016, and the respective estimates and forecasts for 2017 and 2018.

The net effect of input price, output price and volume movements is forecast to have a mixed effect on gross margins for 2018, albeit for the magnitude of change to be small. For example, gross margins for winter wheat are forecast to increase by less than €30 per hectare, while gross margins for spring barley are for no change and winter barely are forecast to increase by approximately €70 hectare. The overall story for the 2018 forecast is for a very small increase in gross margins for cereal crops if a slight increase in cereal price is achieved and trend yields assumed.

**Figure 16: Actual 2016, Estimate 2017 and Forecast 2018, for Cereal Crop Gross Margins**

Source: Teagasc, National Farm Survey Data and Author’s estimates for 2016 & forecast for 2017

Similar to the format used to present margins in 2016 and 2017 earlier in the paper, the forecast net margins for 2018, are presented for the cereal enterprise on specialist tillage farms, as well as the population of such farms disaggregated into one-third groupings based on margins obtained.

Figure 17 shows that the forecast net margins for the cereal enterprise in 2018 are higher than 2017 and 2016. The upward movement in margins is associated mainly with the slight increase in prices forecast for 2018.
Whilst direct costs overall are forecast to increase only slightly in 2018, the story for overhead costs is less optimistic for 2018. Land rent and fuel are both major expenditure items and are both forecast to increase over 2017 price levels. Hence, the narrative for net margin diverges slightly from the gross margin story presented earlier for 2018. Some of the improvements in gross margin figures forecast for 2018 are eroded by fixed cost inflation. Nevertheless, the net result is for a slight improvement in net margins per hectare compared to 2017 for the average cereal enterprise in 2018, with average margins increasing by about €25 per hectare compared to 2017. However, this still leaves net margins for the cereal enterprise significantly less than dairy and sheep enterprises and on a par with beef margins.

5. Concluding Comments

The 2016/2017 production year saw upward movement in cereal gross and net margins for the main cereal crops. With a slight increase in cereal yields and cereal prices, significant straw price increases and only a slight increase in some overhead cost items, there was some upward movement in gross and net margins in 2017. Spring barley and winter barley gross margins increased by approx. €200 per hectare, while winter wheat increased by approximately €300 per hectare. The highest estimated gross margin of all tillage crops in 2017 was winter wheat.

The forecast for net margins on tillage farms in 2018 is for very modest increases in margins estimated for 2017, with the forecast 7 per cent increase in cereal prices in 2018, a return to trend yields and a slight increase in direct costs. The overall picture for cereal crops is that in general margins will remain very tight in 2018, with any upward movement in margins forecast for 2018 not sufficient to return positive net margins on approximately half of all specialist tillage farms in 2018.

References


Acknowledgements

The author would like to thank the staff and recorders of the National Farm Survey, in particular Mr Brian Moran, for their assistance in conducting the analysis contained in this paper, industry contacts that provided valuable feedback on input and output market developments and Agricultural Economics and Farm Surveys Department colleagues who provided valued comments. Any errors or omissions remain the sole responsibility of the author.
### Table A1: Production Costs, Output and Gross Margin for Major Cereal Crops in 2016 (€/ha)

<table>
<thead>
<tr>
<th>Crop</th>
<th>S. Barley</th>
<th>W. Wheat</th>
<th>W. Barley</th>
<th>M. Barley</th>
<th>W. Oats</th>
<th>S. Oats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross Output</td>
<td>1,036</td>
<td>1,433</td>
<td>1,246</td>
<td>1,184</td>
<td>1,285</td>
<td>1,063</td>
</tr>
<tr>
<td>Fertiliser</td>
<td>229</td>
<td>301</td>
<td>311</td>
<td>263</td>
<td>289</td>
<td>220</td>
</tr>
<tr>
<td>Seeds</td>
<td>96</td>
<td>91</td>
<td>99</td>
<td>103</td>
<td>85</td>
<td>98</td>
</tr>
<tr>
<td>Crop Protection</td>
<td>192</td>
<td>262</td>
<td>255</td>
<td>183</td>
<td>197</td>
<td>152</td>
</tr>
<tr>
<td>Hired Machinery</td>
<td>164</td>
<td>147</td>
<td>161</td>
<td>158</td>
<td>69</td>
<td>76</td>
</tr>
<tr>
<td>Other Direct Costs</td>
<td>15</td>
<td>6</td>
<td>6</td>
<td>11</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Total Direct Costs</td>
<td>696</td>
<td>807</td>
<td>831</td>
<td>718</td>
<td>645</td>
<td>550</td>
</tr>
<tr>
<td>Gross Margin</td>
<td>340</td>
<td>626</td>
<td>415</td>
<td>466</td>
<td>640</td>
<td>513</td>
</tr>
</tbody>
</table>

Source: 2016 National Farm Survey Data (2017)

### Table A2: Variation in output and margin 2016: top and bottom performing cereal farms*

<table>
<thead>
<tr>
<th></th>
<th>Spring Barley</th>
<th>Winter Wheat</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bottom</td>
<td>Top</td>
</tr>
<tr>
<td>Yield (tonnes per hectare)</td>
<td>6.7</td>
<td>7.0</td>
</tr>
<tr>
<td>Price per tonne</td>
<td>135</td>
<td>145</td>
</tr>
<tr>
<td>Gross output (€ per hectare)</td>
<td>926</td>
<td>1,134</td>
</tr>
<tr>
<td>Fert., seed, spray (€ per hectare)</td>
<td>522</td>
<td>460</td>
</tr>
<tr>
<td>Machinery hire (€ per hectare)</td>
<td>155</td>
<td>68</td>
</tr>
<tr>
<td>Other direct costs (€ per hectare)</td>
<td>31</td>
<td>6</td>
</tr>
<tr>
<td>Gross Margin (€ per hectare)</td>
<td>212</td>
<td>600</td>
</tr>
<tr>
<td>Allocated Fixed Costs (€ per hectare)</td>
<td>464</td>
<td>412</td>
</tr>
<tr>
<td>Total Costs (€ per hectare)</td>
<td>1,179</td>
<td>946</td>
</tr>
<tr>
<td>Net Margin (€ per hectare)</td>
<td>-283</td>
<td>188</td>
</tr>
</tbody>
</table>

Source: 2016 National Farm Survey Data (2017)
*Excluding farms with less than 10 hectares

### Table A3: Changes in arable crop areas in the EU28

<table>
<thead>
<tr>
<th>Crop Category</th>
<th>2015/16</th>
<th>2016/17</th>
<th>2017/18</th>
<th>2018/19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Cereals</td>
<td>57,140</td>
<td>56,600</td>
<td>55,650</td>
<td>55,710</td>
</tr>
<tr>
<td>Total Oilseeds</td>
<td>11,930</td>
<td>11,910</td>
<td>12,400</td>
<td>12,320</td>
</tr>
<tr>
<td>Total Protein Crops</td>
<td>1,780</td>
<td>1,970</td>
<td>2,070</td>
<td>2,130</td>
</tr>
<tr>
<td>Silage</td>
<td>6,180</td>
<td>6,150</td>
<td>6,110</td>
<td>6,110</td>
</tr>
<tr>
<td>Set-aside &amp; Fallow Land</td>
<td>5,362</td>
<td>5,426</td>
<td>5,639</td>
<td>5,561</td>
</tr>
<tr>
<td>Sugar beet</td>
<td>1,420</td>
<td>1,500</td>
<td>1,730</td>
<td>1,730</td>
</tr>
<tr>
<td>Total area cultivated and set-aside</td>
<td>83,812</td>
<td>83,556</td>
<td>83,599</td>
<td>83,561</td>
</tr>
</tbody>
</table>

Source: Strategie Grains (November 2017)
Irish Pig Sector in 2016

**Sow population**
146 thousand head
down 2.6% on the 2015 level

**Live Pig Exports**
0.414 million head
down 20% on the 2015 level

**Pig Slaughter**
3.211 million head
up 2.8% on the 2015 level

**Feed Prices**
€291 per tonne
down 4% on the 2015 level

**Pig prices**
149 cent per kg
up 1% on the 2015 level

**Margin over feed cost**
43 cent per kg
up 14% on the 2015 level

Source: Teagasc Pig Development Unit, Central Statistics Office and Department of Agriculture, Environment and Rural Affairs Northern Ireland

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Irish Pig Sector in 2017

**Sow Population**
153 thousand head
up 5% on the 2016 level

**Pig Slaughter**
3.295 million head
up 2.8% on the 2016 level

**Live Pig Exports**
0.433 million
up 5% on the 2016 level

**Pig prices**
162 cent per kg
up 8% on the 2016 level

**Feed Prices**
€288 per tonne
unchanged on the 2016 level

**Margin over Feed Costs**
58 cent per kg
up 35% on the 2016 level

Source: Teagasc Pig Development Unit Estimates for 2017 and Forecasts for 2018

---

Irish Pig Sector in 2018

**Sow Population**
153 thousand head
unchanged on the 2017 level

**Pig Slaughter**
up 3.34 million head
up 1.5% on the 2017 level

**Live Pig Exports**
0.438 million
up 1% on the 2017 level

**Pig Prices**
152 cent per kg
down 6% on the 2017 level

**Feed Prices**
€288-298 per tonne
little change on the 2017 level

**Margin over Feed Costs**
48 cent per kg
down 17% on the 2017 level
1. Introduction
In the last two years (2016-2017) the Irish pig industry has experienced higher than average profitability. This has been due to low/stable feed prices and high pigmeat prices in the sector.

Feed ingredient prices have been low in the last four years due to an increase in the global supply of wheat, barley, maize and soybean. Unfortunately in previous years the pig sector couldn’t capitalise on this advantage due to the low pigmeat price. However in spring 2016 this situation changed. China increased pigmeat imports, due to low domestic output, and this consequently increased the E.U. and Irish pig exports and prices through the remainder of 2016 and 2017. In March 2016 the ‘Margin-Over-feed’ was at its lowest in five years but then rapidly improved to generate an annual average of 43c/kg in 2016 and 58c/kg in 2017.

2. Irish Pig Production Costs 2017
The cost of producing pigmeat in Ireland can be broken into feed cost and non-feed costs. Feed currently constitutes 70 per cent of the total cost of producing a pig, with the non-feed inputs contributing the remaining 30 per cent. The primary source of cost volatility from 2012-2015 had been feed cost, but in the last two years costs have stabilised.

2.1 Irish Pig Feed Costs 2017
Feed prices were largely stable in 2017. The large global harvests in 2014-2017 ensured that world stocks were high and therefore prices remained modest. The 2017 composite feed price per tonne is estimated to be €289, virtually unchanged when compared to 2016 (€291).

When the composite feed price is examined over a longer period the 2017 price of €289 is lower than the 5 year average (2013-2017) and 10 year average (2008-2017) of €311 and €298 respectively. Annual Irish composite pig feed prices are shown in Figure 1, expressed in terms of the cost per kg deadweight (dwt).
2.2 Non-feed costs in Irish Pig Production in 2017

The variable and fixed costs can be separated into Non-feed Costs (excl. financial) and Financial Costs. The data quoted for the Irish industry is collected from herds using the Teagasc ePM herd recording system which records, analyses and benchmarks herd productivity and financial performance. There are currently 96,000 sows on the database from a national herd of about 153,000 (63% of total). The costs quoted are based on the national 2016 ePM data, which are the most recent analysis of annualised costs available. Non-feed costs are itemised in Table 2.

Table 2: Non-Feed Costs in ePM Recorded Herds

<table>
<thead>
<tr>
<th>Cost Item</th>
<th>2016</th>
<th>2012-2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthcare</td>
<td>6.2</td>
<td>6.4</td>
</tr>
<tr>
<td>Heat, Power Light</td>
<td>4.2</td>
<td>4.2</td>
</tr>
<tr>
<td>Transport</td>
<td>1.2</td>
<td>1.2</td>
</tr>
<tr>
<td>AI</td>
<td>1.8</td>
<td>1.8</td>
</tr>
<tr>
<td>Manure</td>
<td>1.5</td>
<td>1.6</td>
</tr>
<tr>
<td>Labour/Management</td>
<td>13.3</td>
<td>12.7</td>
</tr>
<tr>
<td>Repairs</td>
<td>2.2</td>
<td>2.4</td>
</tr>
<tr>
<td>Phone/Office</td>
<td>1</td>
<td>0.8</td>
</tr>
<tr>
<td>Environment</td>
<td>0.4</td>
<td>0.5</td>
</tr>
<tr>
<td>Insurance</td>
<td>0.9</td>
<td>0.8</td>
</tr>
<tr>
<td>House rental</td>
<td>1.3</td>
<td>1.2</td>
</tr>
<tr>
<td>Contract Costs</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>Water</td>
<td>0.4</td>
<td>0.4</td>
</tr>
<tr>
<td>Dead Pigs Disposal</td>
<td>0.7</td>
<td>0.7</td>
</tr>
<tr>
<td>Stock Depreciation</td>
<td>1.8</td>
<td>1.7</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>1.2</td>
<td>1.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>39.6</strong></td>
<td><strong>39.0</strong></td>
</tr>
</tbody>
</table>

Source: Teagasc ePM Report 2016

The non-feed costs in 2016 were marginally higher (1.5%) when compared to the previous five year average, but ten cent higher than the 2012 total of 29.8 cent per kg dwt. The single largest increase in 2016 costs when compared to 2015 was an increase in labour costs which rose by 0.6 cent per kg dwt.

2.3 Financial Costs in Irish Pig Production in 2016

These costs include interest payments and building depreciation and vary greatly from unit to unit depending on the age of the unit and the level of capital investment undertaken in the business in recent years. Financial costs are itemised in Table 3.

We estimate that the cost of building depreciation and interest is significantly lower than the true level required for a healthy pig industry. This reflects the sector’s reduced capital investment in recent years due to the low profitability of the industry.

Table 3: Financial Costs in ePM recorded herds

<table>
<thead>
<tr>
<th>Cost Item</th>
<th>2016</th>
<th>2012-2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest</td>
<td>1.7</td>
<td>1.8</td>
</tr>
<tr>
<td>Building Depreciation</td>
<td>4.9</td>
<td>4.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>6.6</strong></td>
<td><strong>6.0</strong></td>
</tr>
</tbody>
</table>


2.4 Total Cost of Irish Pig Production in 2017

The estimated annualised cost of production in 2017 (based on 2016 non-feed costs and 2017 feed costs) was 150.2 cent per kilogram dwt for pigs delivered to the slaughter plant. This production cost remained very stable throughout the year reflecting the stable feed price.

3. Irish Pig Prices in 2017

The estimated average pig price in 2017 was 162 cent per kg dwt, which was marginally higher than the five year average (2013-2017) of 160.4 cent per kg dwt.

The annualised 2017 pig price was 13 cent (8%) higher than 2016, but this average hides large fluctuations. The lowest monthly price in 2016 was 134c/kg (March) and the highest price In 2017 was 172c/kg (July), a 22 percent increase within 18 months.

The 2014 outbreak of PEDv disease in the U.S. reduced U.S pigmeat exports. This temporarily helped the E.U. exporters to off-set the loss of the important Russian export market. However by mid-2015 the Irish pig price began to drop due to the U.S. industry recovering and an oversupply of EU pigmeat production.

This decline continued for the next 12 months, until March 2016, with the Irish price falling to its lowest ebb of 134c/kg in March 2016.
Table 4: Monthly Irish Pig Price in 2017

<table>
<thead>
<tr>
<th>Month</th>
<th>Pig Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>158</td>
</tr>
<tr>
<td>February</td>
<td>162</td>
</tr>
<tr>
<td>March</td>
<td>162</td>
</tr>
<tr>
<td>April</td>
<td>167</td>
</tr>
<tr>
<td>May</td>
<td>167</td>
</tr>
<tr>
<td>June</td>
<td>167</td>
</tr>
<tr>
<td>July</td>
<td>172</td>
</tr>
<tr>
<td>August</td>
<td>167</td>
</tr>
<tr>
<td>September</td>
<td>162</td>
</tr>
<tr>
<td>October</td>
<td>157</td>
</tr>
<tr>
<td>November*</td>
<td>153</td>
</tr>
<tr>
<td>December*</td>
<td>153</td>
</tr>
<tr>
<td>Average</td>
<td>162</td>
</tr>
</tbody>
</table>

Source: Teagasc Pig Department

* Estimate / Forecast

Fortunately for European producers, the Chinese sow herd contracted dramatically in 2015 and 2016, with an estimated 12 million sows being culled, which is equivalent to the total EU herd. This resulted in the domestic Chinese pig price escalating to the equivalent of $300/head and triggered a surge of imports into China. The pig price recovered across Europe in the latter half of 2016 to generate an annualised price similar to 2015. In the first part of 2017 the price rise continued until it reached a peak in July 2017. From July-Dec 2017 the E.U. pig price has decreased due to three factors; reduced Chinese pigmeat import volumes, increased U.S. competition due to reduced use of the growth promoter “Paylean” and the euro exchange rate reducing our competitiveness.

Table 5: European Pig Prices January to October 2016 and 2017

<table>
<thead>
<tr>
<th>Country</th>
<th>2016</th>
<th>2017</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAYS-BAS VION</td>
<td>1.44</td>
<td>1.67</td>
<td>15.4</td>
</tr>
<tr>
<td>DK 61%</td>
<td>1.29</td>
<td>1.44</td>
<td>11.9</td>
</tr>
<tr>
<td>DE ZMP 56%</td>
<td>1.48</td>
<td>1.65</td>
<td>12.1</td>
</tr>
<tr>
<td>ES Llerida vif</td>
<td>1.13</td>
<td>1.31</td>
<td>15.1</td>
</tr>
<tr>
<td>IT vif Modena</td>
<td>1.34</td>
<td>1.60</td>
<td>18.7</td>
</tr>
<tr>
<td>FR MPB 56%</td>
<td>1.29</td>
<td>1.41</td>
<td>9.3</td>
</tr>
</tbody>
</table>

Source: MPB 2017

4. Profitability of Irish Pig Production in 2017

The margin over feed cost was 58 c/kg per kg dwt in 2017, the highest since 2006 and a 35% increase over 2016.

Table 6: Average Margin over Feed Costs from Compound Feed from 2009-2017

<table>
<thead>
<tr>
<th>Year</th>
<th>Pig Price (Net)</th>
<th>Feed Cost</th>
<th>Margin over Feed</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>145</td>
<td>94</td>
<td>51</td>
</tr>
<tr>
<td>2010</td>
<td>140</td>
<td>93</td>
<td>47</td>
</tr>
<tr>
<td>2011</td>
<td>151</td>
<td>112</td>
<td>39</td>
</tr>
<tr>
<td>2012</td>
<td>166</td>
<td>123</td>
<td>43</td>
</tr>
<tr>
<td>2013</td>
<td>176</td>
<td>132</td>
<td>44</td>
</tr>
<tr>
<td>2014</td>
<td>167</td>
<td>118</td>
<td>49</td>
</tr>
<tr>
<td>2015</td>
<td>148</td>
<td>111</td>
<td>37</td>
</tr>
<tr>
<td>2016</td>
<td>149</td>
<td>106</td>
<td>43</td>
</tr>
<tr>
<td>2017*</td>
<td>162</td>
<td>104</td>
<td>58</td>
</tr>
</tbody>
</table>

Source: Teagasc Pig Development Department

When the 2017 margin over feed (MOF) is compared to the average margin over feed of the last five, ten, fifteen, and twenty years (see Table 7) the difficult trading conditions and low profitability of recent years becomes clear.

If an average MOF of 50 cent per kg (estimated by the author as a requirement to meet all production costs including financial repayments) then the 58 c/kg achieved in 2017, exceeds this target for the first time in 5 years. The low margin in the previous five years (46 cent per kg dwt) requires this higher margin to be retained in order to further reduce accumulated feed credit debt and improve the quality of building structures in the sector.

Table 7: Margin Over Feed in 2017 compared to the 5, 10, 15, and 20 year average

<table>
<thead>
<tr>
<th>Margin Over Feed</th>
<th>% Diff.</th>
</tr>
</thead>
<tbody>
<tr>
<td>58</td>
<td>-</td>
</tr>
<tr>
<td>46.2</td>
<td>+26</td>
</tr>
<tr>
<td>45.0</td>
<td>+29</td>
</tr>
<tr>
<td>47.0</td>
<td>+23</td>
</tr>
<tr>
<td>46.2</td>
<td>+26</td>
</tr>
</tbody>
</table>

Source: Teagasc Pig Development Department

*Estimate
Figure 2 illustrates the pig price received when compared to the total production cost (feed plus 50 cent) since 1997.

Figure 2: Pig Price compared to estimated Total Production Cost

Source: Teagasc Pig Development Department
2017 is an estimated value

5. Irish Pig and Sow numbers in 2017

The latest sow survey of commercial pig production units reveals an increase in sow numbers when compared to the previous survey. Irish sow numbers are shown in Table 8.

Table 8: Sow Numbers in Commercial Pig Herds 2010-2017

<table>
<thead>
<tr>
<th>Year</th>
<th>Sow Numbers 000 head</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>161.4</td>
</tr>
<tr>
<td>2011</td>
<td>156.2</td>
</tr>
<tr>
<td>2012</td>
<td>145.7</td>
</tr>
<tr>
<td>2013</td>
<td>147.5</td>
</tr>
<tr>
<td>2014</td>
<td>151.1</td>
</tr>
<tr>
<td>2015</td>
<td>149.9</td>
</tr>
<tr>
<td>2016</td>
<td>146.0</td>
</tr>
<tr>
<td>2017*</td>
<td>153.0</td>
</tr>
</tbody>
</table>

Source: Teagasc Pig Development Department  *Estimate

The sow herd census indicates that the Irish sow population continues to remain remarkably robust at about 153,000 sows.

Table 9: Irish born pigs slaughtered: 2012 to 2017

<table>
<thead>
<tr>
<th>Year</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slaughter Pigs million head</td>
<td>3.5</td>
<td>3.65</td>
<td>3.63</td>
<td>3.72*</td>
</tr>
</tbody>
</table>

Source: Teagasc Pig Department  *Estimate

The number of Irish pig disposals in 2017 is estimated to be 3.72 million pigs, which is marginally higher than 2016, and continues the upward trend of the last few years. This is a reflection of the increased number of pigs born alive in the national herd and improved national herd health.

Table 10: Slaughter and Live Export to N. Ireland of Irish Born Pigs from 2007 to 2017

<table>
<thead>
<tr>
<th>Year</th>
<th>Licensed Export Plants in Ireland million head</th>
<th>Exports to Northern Ireland % of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>2.570</td>
<td>0.512</td>
</tr>
<tr>
<td>2008</td>
<td>2.511</td>
<td>0.457</td>
</tr>
<tr>
<td>2009</td>
<td>2.363</td>
<td>0.482</td>
</tr>
<tr>
<td>2010</td>
<td>2.601</td>
<td>0.558</td>
</tr>
<tr>
<td>2011</td>
<td>2.847</td>
<td>0.610</td>
</tr>
<tr>
<td>2012</td>
<td>2.907</td>
<td>0.612</td>
</tr>
<tr>
<td>2013</td>
<td>2.829</td>
<td>0.570</td>
</tr>
<tr>
<td>2014</td>
<td>2.940</td>
<td>0.519</td>
</tr>
<tr>
<td>2015</td>
<td>3.132</td>
<td>0.514</td>
</tr>
<tr>
<td>2016</td>
<td>3.221</td>
<td>0.414</td>
</tr>
<tr>
<td>2017*</td>
<td>3.295</td>
<td>0.433</td>
</tr>
</tbody>
</table>

Source: DAFM & DAERA  *Estimate

The export of Irish born pigs to Northern Ireland (NI) stabilised during 2016 but at a lower level than in recent years. Since 2012 the annual number of pigs exported to NI has decreased by an estimated 180,000 pigs.

The trend of lower Irish slaughter pig disposals in 2016 was also reflected in Germany, Denmark and the Netherlands, as illustrated in Table 11.

Table 11: European & N. American Pig Disposals

<table>
<thead>
<tr>
<th>Country</th>
<th>2016*</th>
<th>2017*</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>42.1</td>
<td>41.8</td>
<td>-0.6%</td>
</tr>
<tr>
<td>Spain</td>
<td>32.6</td>
<td>32.6</td>
<td>0%</td>
</tr>
<tr>
<td>France</td>
<td>15.7</td>
<td>15.3</td>
<td>-2.5%</td>
</tr>
<tr>
<td>Denmark</td>
<td>14.6</td>
<td>13.8</td>
<td>-5.4%</td>
</tr>
<tr>
<td>Netherlands</td>
<td>12.1</td>
<td>12.4</td>
<td>2.1%</td>
</tr>
<tr>
<td>UK</td>
<td>8.1</td>
<td>7.7</td>
<td>-4.8%</td>
</tr>
<tr>
<td>Total</td>
<td>125.2</td>
<td>123.6</td>
<td>-1.3%</td>
</tr>
<tr>
<td>U.S.</td>
<td>95.9</td>
<td>98.7</td>
<td>2.9%</td>
</tr>
<tr>
<td>Canada</td>
<td>16.8</td>
<td>17.1</td>
<td>1.6%</td>
</tr>
</tbody>
</table>

*Based on 42 weeks of production
Source: MPB 2017
Over the first 42 weeks of 2017 the combined pig slaughtering of the major European producing countries fell by an estimated 1.3% when compared to 2016. Spanish slaughtering numbers had been rising rapidly over the last 5 years (+20%) but plateaued in 2017 but the industry expectation is that this is a temporary pause. In 2016 U.S. slaughter number rebounded (+1.3%) in the aftermath of its PEDv disease outbreak. This upward momentum has continued in 2017 (+2.9%) with mid-September achieving a record high daily slaughter volume of 455,000 pigs.

6. EU Pigmeat Exports & Imports in 2017

The export of pigmeat products from the EU decreased in 2017 by 10% (Jan-Aug) but this is in response to a previously unsustainable increase in 2016 of 33 per cent as shown in Table 12. The reduction is due to reduced Chinese imports and increased competition from the U.S. and Canada.

Table 12: Pigmeat exports from selected countries

<table>
<thead>
<tr>
<th>Country</th>
<th>2016</th>
<th>2017*</th>
<th>change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>million tonnes</td>
<td></td>
<td>%</td>
</tr>
<tr>
<td>EU</td>
<td>2.75</td>
<td>2.48</td>
<td>-10</td>
</tr>
<tr>
<td>USA</td>
<td>1.48</td>
<td>1.61</td>
<td>10</td>
</tr>
<tr>
<td>Canada</td>
<td>0.81</td>
<td>0.86</td>
<td>6</td>
</tr>
<tr>
<td>Brazil</td>
<td>0.47</td>
<td>0.54</td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
<td>5.51</td>
<td>5.49</td>
<td>-0.4</td>
</tr>
</tbody>
</table>

Source: MDP * Jan-Aug 17

7. Outlook for the Irish Pig Market in 2018

The outlook for the pig market is usually a reflection of global pig feed and pig price trends as these are the key factors affecting profitability. However added to the mix now is Brexit negotiations during 2018 and 2019. While the trade effects of this are currently unknown, it is unlikely to be a favourable development to the Irish pig market.

7.1 Irish Pig Feed Price Outlook in 2018

Pig feed is the single largest input cost. Therefore the trend in the price of this input will have a substantial effect on the profitability of the sector in 2018. The feed price outlook is dependent on wheat, maize and soyabean, as these are the principal pig feed cost drivers.

The estimated composite compound pig feed price in December 2017 is €288 per tonne. The bumper global harvests in 2015-2017 have resulted in very healthy stock-to-end use percentages for wheat (36.2%), maize (19.1%) and soyabean (28.4%) – USDA October 2017. These copious stocks should ensure stable prices until mid-2018, whereupon the progress of the autumn harvest 2018 will dictate prices for the end of 2018 which may see a very moderate rise (3-5%).

The South American soyabean harvest is currently being planted with Brazilian production quantities of 107 million tonnes forecast, which would be slightly lower (-5%) than the previous harvest but still the second largest Brazilian harvest ever. While this should dictate low soyabean prices in 2018, it is expected to be offset by higher Chinese imports of 93 million tonnes. The outlook for soyabean prices therefore is for little change, provided normal weather conditions prevail.

The current feed ingredients futures market prices indicate very little change over the 2017 annual composite pig feed price. This would indicate that the composite compound pig feed price will continue stable in the range of €288 to €298 for 2018.

7.1.1 Irish Pig Prices in 2018

The Irish pig price was high in the first three quarters of 2017 with a sharp decrease in the last quarter as predicted. The return to stability of the EU sow herd in 2017 and increased numbers of piglets born alive, will increase the supply of European pigs. It is estimated this may be in the region of 2.0 to 2.5 per cent. This increased EU volume on the market, with record increases in US slaughter volumes and negative Euro exchange rates will provide an increased degree of export competition in 2018.

Irish and European pig prices will be significantly influenced by the level of Chinese pigmeat imports in 2018. The Chinese sow herd had stabilised in early 2017 but recent reports indicate renewed high culling rates as part of a final translocation program to move their pig herd to their ‘bread basket’ in the tillage regions in the north-east of the China. Local government appear to be anxious to ensure that only pig units that meet stringent environmental standards will be licensed to re-open in the heavily industrialised restricted zones.
This renewed sow cull will produce a deficit of pigmeat on the domestic Chinese market and the shortfall will continue to be filled by European and American exports. This should reduce the extra volume of pigmeat overhanging the European market. However, although Chinese import volumes may continue buoyant, intense international competition from the U.S. and Canada may see Europe’s Chinese exports further decline. The U.K. market is our single biggest export market. While the weakening pound against the Euro may continue to increase U.K. food inflation this may not have a dramatic effect on pigmeat demand in the short term for two reasons. Firstly, our main U.K. competitors (Denmark, Netherlands and Spain) are all in the euro zone therefore the effect of the exchange rate is equalised. Secondly, higher U.K. consumer meat prices may result in a substitution effect from the higher cost meats (beef & Lamb) to lower costs meats (poultry & pigmeat).

Overall, the pig price will remain robust but weaker and a 5-7 per cent decrease in the annual pig price is forecast for 2018.

7.1.2 Profit Margin in 2018
If the current composite feed price remains largely unchanged until the latter half of 2018 and the pig price also remains robust, albeit weaker, for much of 2018 (due to continued Chinese imports), then there will continue to be a profitable margin for Irish pig producers in 2018. Although the margin may not be as high as 2017 it will still allow the industry to reduce current levels of feed credit and undertake required repairs and capital investment.

8. Conclusion
In 2017 the Irish pig industry experienced stable feed prices and moderate fluctuations in pig prices. This returned a very healthy margin-over-feed of 58 cent per kg dwt which exceeded the five year average (46c/kg) and the minimum required margin-over-feed of 50 cent. The estimated 2017 composite pig feed cost of €288 per tonne is expected to be maintained into 2018 with little expected change.

The market conditions for pigmeat in 2018 will return a weaker pig price than the current year, primarily due to increased E.U. pigmeat supplies and increased competition for the Chinese pigmeat market with a resultant moderate reduction in Irish pig prices.

The outlook for 2018 is for the pig sector to continue to remain profitable but at a lower level than in 2017. This positive outlook is dependent on the Chinese export market remaining buoyant and no emerging disease outbreak in Europe.
Situation and Outlook for Forestry 2018

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1. Introduction

Irish forestry supports a strong, vibrant, export-oriented products sector. Forestry has the capacity to have an increasingly important role in rural development, providing opportunities for diversification of farm income as well as provision of rural based employment (DAFM, 2015a).

Appropriate afforestation and other grant schemes will continue to play a key role in the stimulation of farm forestry and in the encouragement of increased productivity in conifer and quality broadleaf forests. A target for expansion of forest cover to 18 percent of the land area by 2046 is included in the National Strategic Plan for Forestry (DAFM, 2014) using an integrated approach to achieve such targets across land uses and schemes.

Government commitment to the development and support of forestry will continue in 2018, with a budget allocation of €106m for the sector, in line with the Forestry Programme 2014-2020. This funding also recognises the strong potential role of forestry in helping to achieve targets set for climate change mitigation.

2017 has been a year of both progress as well as significant challenges within the sector. A coordinated and sustained effort will be required across the forest sector to help achieve critical afforestation and timber mobilisation targets. Continued unhindered access to the UK market is essential to the continued expansion of the industry and employment, exports and environmental returns that it creates (IFFPA, 2017).

2. Value of the Forest Sector

Analysis by the Forest Service shows that the total direct value of economic activity in the forestry growing/harvesting sub-sectors in 2012 totalled €387m. The value to overall Gross Domestic Product or Gross Value Added (GVA) was €136.6m. A strong multiplier effect is also evident, with €0.78 being generated in wider economic activity for every €1 generated through growing/harvesting sub-sectors. The latter therefore contributed an overall value of €688.7m to the wider Irish economy.

Direct output in the wood products sub-sector (i.e. panel board mills, sawmills and other wood products sector) was €1.389m in 2012. It added €391.6m in terms of GVA to the economy. For every €1 spent in wood processing, an extra €0.66 is generated in the wider economy. An approximation of the full economic value of the forest sector in 2012 is €2.3 billion, when both indirect and induced effects are taken into account (DAFM, 2016b).

After wind energy, wood fuels are the largest contributor to renewable energy generation in Ireland, while forests are a key component of national climate change mitigation strategy through carbon sequestration and the sustainable use of wood products (DAFM, 2015a).

The most recent aggregate employment figure for the forest sector as a whole is estimated at close to 12,000 persons, the majority of whom are employed in rural Ireland. (Ni Dhubháin et al, 2012). Ireland’s timber supply has the potential to increase sharply in future years, creating significantly more jobs and increased exports (IFFPA, 2017).

Output from the Ecovalue Project (COFORD, 2015) provides baseline figures and a foundation for future assessment in the study of a range of ecosystem services delivered by forests. The volume of carbon sequestered by Irish forests (including those planted prior to 1990) in 2013 was 3,946.9 kt CO₂ yielding an indicative value of €22.9 million per annum. The annual value of forest biodiversity is estimated to be €68 million. The value of recreation in Irish forests is estimated at €179 million, with an estimated 29 million visits to forest per annum. Upton et al. (2014) have estimated this forest visitation level by combining survey data on behalf of COFORD with spatially...
explicit forest recreational demand for a simulated population of Ireland (SMILE model).

3. Planting in 2017

3.1 Planting levels

The current total forest area in Ireland is over 756,000 hectares (ha), representing 11 percent of the total land area. Privately owned forests comprise over 47 percent of this total, with over 21,000 individual forest owners having one or more grant aided forest established since 1980 (Forest Service, 2016b). Farmers accounted for 83 percent of the private afforestation between 1980 and 2015.

The achievement of sustainable planting targets is a critical requisite for the success of the forestry programme in Ireland. A total of 6,500 hectares (ha) of new forests were established in 2016. The programme planting target for 2017 provided for 7,100 hectares under the Afforestation Scheme Grant and Premium Categories (GPCs).

Figure 1: Annual planting 2012 to 2016, with estimate for 2017 and 2018 target

As of 22nd November, 2017, Forest Service data shows that 5,008 ha of new forests have been planted. Based on proportionate increases achieved during the November-December period in recent years, the end of year afforestation figure is projected to reach approximately 5,400 (Figure 1). This would represent a shortfall of 17 percent on 2017 planting targets. It highlights the urgency of the challenge to ensure a sustainable increase in afforestation levels in future years. The afforestation target for 2018 is over 7,200 hectares.

3.2 Deciding to plant

A complex range of factors are believed to have contributed to the anticipated shortfall in planting levels. Issues such as current GLAS participation, land/site suitability factors, unenclosed land status, viability of plot size, environmental restrictions, succession/land ownership, limited access, on-going desire to farm, land values and the permanent nature of forestry, arose as potential factors during the 2017 Teagasc forestry clinic series (Teagasc internal document). On-going restrictions due to environmental considerations have affected the availability of land suitable for planting (COFORD Land Availability Working Group, 2016).

Farmers’ attitudes towards forestry are strongly linked with land quality and possible alternative land uses (Ryan et al., 2013). Ryan and O'Donoghue (2016) also show that soil type and the agricultural market income and subsidies prevailing in the year of planting all have an effect on the economic attractiveness of afforestation. The potential relative returns to agriculture and forestry was also found to be a significant driver of the afforestation decision in the study.

The Teagasc National Farm Survey (NFS) collects information annually on a sample of farms with a forest enterprise. The sample is statistically weighted to represent the national farming population. Of the 84,736 farms represent by the survey in 2016 (Dillon et al., 2017), 8,279 farms (almost 10 percent) have forests, representing an average ownership of 10.8 ha per forest owner. An analysis, by NFS farm system, indicating the extent to which farms include forests is shown in Table 1.

<table>
<thead>
<tr>
<th>System</th>
<th>Farm Population</th>
<th>Population with forest (No)</th>
<th>% with forest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dairy</td>
<td>15,639</td>
<td>1,267</td>
<td>8.1</td>
</tr>
<tr>
<td>Cattle Rearing</td>
<td>19,221</td>
<td>1,830</td>
<td>9.5</td>
</tr>
<tr>
<td>Cattle Other</td>
<td>27,756</td>
<td>2,679</td>
<td>9.7</td>
</tr>
<tr>
<td>Sheep</td>
<td>12,758</td>
<td>949</td>
<td>7.4</td>
</tr>
<tr>
<td>Tillage</td>
<td>7,387</td>
<td>1,395</td>
<td>18.9</td>
</tr>
<tr>
<td>Mixed Livestock</td>
<td>1,975</td>
<td>160</td>
<td>8.1</td>
</tr>
<tr>
<td>ALL</td>
<td>84,736</td>
<td>8,279</td>
<td>10</td>
</tr>
</tbody>
</table>

Source: Dillon et al. 2017
Analysis shows that the largest farm populations with forests are in the cattle rearing and cattle other systems. Teagasc NFS data suggest that farmers involved in livestock production (cattle rearing, cattle other or sheep) are more likely than those involved in dairy and tillage to have land in forestry use (Howley et al., 2011). This is likely to be a reflection of the higher relative returns from these agricultural systems. It is noteworthy however that forestry is significantly represented (% with forests) in sectors such as tillage and dairy.

Ryan et al., (2016) analysed returns from afforestation of agricultural land arising from the planting of a conifer crop (Grant and Premium Category 3) for a range of farm systems and soil types. The annual income foregone from the superseded agricultural enterprise in 2015 for each soil type (Table 2) is included as a cost in each year of the forest rotation. Therefore annual equivalised income, net of opportunity cost, is generated and included in the analysis (Figure 2).

Table 2: Sitka spruce (SS) yield class (YC) estimates for NFS agricultural soil classes

<table>
<thead>
<tr>
<th>Soil Class</th>
<th>Agricultural Use</th>
<th>Soil Descriptor</th>
<th>SS YC</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC1</td>
<td>Wide</td>
<td>No limitations</td>
<td>24</td>
</tr>
<tr>
<td>SC2</td>
<td>Moderately wide</td>
<td>Minor limitations</td>
<td>24</td>
</tr>
<tr>
<td>SC3</td>
<td>Somewhat limited</td>
<td>Higher elevations, heavier, poorer structure</td>
<td>20</td>
</tr>
<tr>
<td>SC4</td>
<td>Limited</td>
<td>Poor drainage</td>
<td>20</td>
</tr>
<tr>
<td>SC5</td>
<td>Very limited</td>
<td>Agricultural potential greatly restricted</td>
<td>18</td>
</tr>
<tr>
<td>SC6</td>
<td>Extremely limited</td>
<td>Mountainous, steep slopes, shallow soil</td>
<td>14</td>
</tr>
</tbody>
</table>

The study found that farmers who stand to benefit the most from planting are those in the cattle and sheep systems that are likely to plant land that is marginal for agriculture but which is highly productive for forestry. The highest gains are evident on marginal land at yield classes 18 and 20 (SC5 and SC4 respectively). Taking a long-term perspective, cattle and sheep farmers may gain between €100 and €300 per hectare on average for each year of the forest rotation (Figure 2). Teagasc, in conjunction with the Forest Service, has developed and will actively implement a national campaign to promote sustainable afforestation up to 2020 and beyond. The support and input of stakeholders across the forest sector is a critical requirement to achieve desire impacts.

Figure 2: Annual Equivalised Net Farm Afforestation Income per hectare by farm system and soil type

Source: Ryan et al. 2016
Note: based on 2015 agricultural incomes and forest premiums, over the forest rotation.

4. Timber Harvest and Processing
4.1 Timber Harvesting

Approval for the felling of trees in Ireland is licensed by the Forest Service. The Forestry Act 2014 has superseded the 1946 Forestry Act and commenced in May 2017. The new Act continues the requirement for applicants to give notice of intention to fell trees and provides for a single licence process for felling. Felling licences may be up to 10 years duration, which may be extended by the Forest Service for one or more further periods, as appropriate. The number of General Felling Licences (GFLs) issued annually can be used as an indicator of how many forest owners are considering harvesting part or all of their forests. These figures are presented in Figure 3.

Figure 3: General Felling Licences issued, 2013 to September, 2017

Source: Forest Service, various years
The figure of 2,267 GFLs issued to the end of September, 2017 represents an area of 27,966 ha, comprising both Coillte and private sector forestry for this year. Under the 1946 Forestry Act, licences have generally been issued for up to a 5 year period. Not all felling will occur in the year that the licences were issued. The number of GFLs issued to September 2017 is 10 percent lower than the corresponding period in 2016 (Forest Service, 2017), while the area (thinning and clearfell) was 36 percent lower. However, there was a large spike in Coillte GFL applications in the October-December 2016 period, some of which is may have contributed to the 2017 overall harvesting programme.

Table 3 shows the forest areas with felling licences approvals for both thinning and clearfelling in privately-owned forests between 2010 and 2017. The area issued with felling licences for thinning has been on an upward trend since 2010, with a 66 percent increase by 2014 (Forest Service, 2014) as a consequence of damage by Storm Darwin, the majority of which has now been processed. The year-to-date area licensed for thinning and clearfell in September, 2017 is already 11.2 percent lower than the equivalent figure for 2016 total (Table 3).

Table 3: Area of felling licences issued for private forests, 2010-2017

<table>
<thead>
<tr>
<th>Year</th>
<th>Thin (ha)</th>
<th>Clearfell (ha)</th>
<th>Total (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>10,382</td>
<td>439</td>
<td>10,821</td>
</tr>
<tr>
<td>2011</td>
<td>12,275</td>
<td>590</td>
<td>12,865</td>
</tr>
<tr>
<td>2012</td>
<td>13,037</td>
<td>467</td>
<td>13,504</td>
</tr>
<tr>
<td>2013</td>
<td>15,150</td>
<td>394</td>
<td>15,544</td>
</tr>
<tr>
<td>2014</td>
<td>15,742</td>
<td>3,447</td>
<td>19,189</td>
</tr>
<tr>
<td>2015</td>
<td>11,198</td>
<td>2,012</td>
<td>13,210</td>
</tr>
<tr>
<td>2016</td>
<td>13,460</td>
<td>1,216</td>
<td>14,676</td>
</tr>
<tr>
<td>2016 (to Sept)</td>
<td>16,549</td>
<td>1,348</td>
<td>17,897</td>
</tr>
<tr>
<td>2017 (to Sept)</td>
<td>11,799</td>
<td>1,231</td>
<td>13,030</td>
</tr>
</tbody>
</table>

Source: Forest Service, various years

4.2 Timber Processing

In 2016, 3.36 million cubic metres (m³) of roundwood (including firewood) was harvested in Ireland (O’Driscoll & Hendrick, 2017), of which 0.62 million m³ came from the private forestry resource. This total harvest is the highest level since records began in 1961. A substantial part of the increase can be attributed to factors such as the final tidy up on Storm Darwin-affected forests as well as the increasing crop maturity of the private forest resource. Over the same period, 3.11 million m³ of roundwood was available for processing, a 1.3 percent increase on 2015 levels.

Interim figures for felling licences issued up to September for 2017 combined with feedback from industry suggest that that volume of private timber harvested will be slightly down in 2017. The figure for 2018 is expected to show modest growth, dependent on continued buoyancy in UK markets and increased concentration on timber mobilisation in private forests.

Table 4: Total roundwood in Ireland (2012-2016)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>000 m³ overbark</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coillte</td>
<td>2,485</td>
<td>2,588</td>
<td>2,517</td>
<td>2,470</td>
<td>2,733</td>
</tr>
<tr>
<td>Private</td>
<td>354</td>
<td>448</td>
<td>597</td>
<td>729</td>
<td>622</td>
</tr>
<tr>
<td>Total</td>
<td>2,839</td>
<td>3,036</td>
<td>3,114</td>
<td>3,199</td>
<td>3,355</td>
</tr>
</tbody>
</table>

Source: O’Driscoll & Hendrick, 2017

Eight companies process over 90 percent of Irish sawmilling output and provide the main markets for sawlog and stakewood assortments coming from Irish Forests (Drima Market Research Survey, 2017). In 2016, sawmill roundwood intake was 2.14 million m³ which converted to 0.99 m³ of sawn timber and 0.15 million m³ of round stakes. Overall, roundwood intake to sawmills increased by 5 percent over 2015 levels, (O’Driscoll and Hendrick 2017). Over 75% of the roundwood requirement of sawmills was provided by Coillte with the balance supplied by the private forest sector, with some imports. The production of wood residues (bark, wood chip, sawdust and post-consumer wood product) increased by 0.6 percent to 1.42 million m³. These residues go towards a range of uses, including panel board manufacture and as CHP/boiler fuel, residue exports and mulches.

During 2016, an estimated total of 774,000 m³ of wood based panels were produced in three major panel board mills from pulpwod (884,000 m³), wood chip (413,000 m³), sawdust (68,000 m³) and recycled wood fibre (70,000m³) (O’ Driscoll and Hendrick, 2017), a slight increase in 2015 levels.

5. Timber Markets in 2016/2017

5.1 Domestic Market

Overall net demand for roundwood/wood fibre on the island of Ireland is forecast to increase from 4.60 million m³ in 2014 to 6.41 million m³ by 2020, an annualised rate of increase of 6 percent
(COFORD Wood Mobilisation Group, 2015). Boardmill demand (including the use of sawmill residues) is forecasted to increase from 1.40 million m$^3$ in 2014 to 1.60 million m$^3$ by 2020, an increase of some 14 percent overall or approximately 2.5 percent year-on-year. This demand forecast is currently in the process of being updated and is expected to be available by the end of 2017.

Sawmilling demand is forecast to rise from 2.67 million m$^3$ in 2014 to 3.28 million m$^3$ by 2020, an increase of 0.6 million m$^3$, a 3.5 percent year-on-year increase (COFORD Wood Mobilisation Group, 2015). The rates of growth in demand for raw material are directly linked to the expected growth in product demand.

Projected buoyant demand in the domestic timber markets for the sawmilling sector is consistent with a prediction of Irish GDP growth forecast of 5 percent in 2017 and 4 percent in 2018 as outlined in the ESRI quarterly Economic Commentary (McQuinn et al., 2017). The Ulster Bank Purchasing Managers Index (PMI), measures activity in the construction sector. An index reading above 50.0 indicates that the economy is generally expanding. While the index slipped to 54.5 in October 2017 from 56.5 in the previous month, nonetheless, it has expanded for 50 successive months with housing and commercial construction showing strong growth under the index (Figure 4).

**Figure 4: Five-Year Construction PMI**

![Graph showing the trend of PMI from 2013M6 to 2017M6](image)

Source: Ulster Bank, (index readings above 50 indicates expansion in the economy)

In 2016, an estimated 46 percent of the Irish market for sawn softwood timber was supplied by domestic production, with the balance being imported (O’Driscoll and Hendrick, 2017). The domestic market consumed 13 percent of construction timber production, 23 percent of pallet production and 19 percent of wood-based panel board in 2016. The continuing growth in demand for timber for construction in Ireland is illustrated in Table 5.

The demand for higher value construction timber has risen in recent years, with the number of completed houses growing by 20 percent over the period 2016-2017. The Construction Industry Federation (CIF, 2017) estimates that the level of new residential completions for 2017 will be in the region of 18,000 units with this figure expected to increase to 20,000 units in 2018. Based on trends in household formation, there is likely to be an increase in demand for housing from the current level of 23,000 units per annum to just over 30,000 per annum in 2024 (Bergin et al, 2016)

**Table 5: Actual & forecast house completions in Ireland from 2012 to 2018 (forecast (f))**

<table>
<thead>
<tr>
<th>Year</th>
<th>House completions*</th>
<th>Growth rate 1990 = 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>8,488</td>
<td>43.44</td>
</tr>
<tr>
<td>2013</td>
<td>8,301</td>
<td>42.48</td>
</tr>
<tr>
<td>2014</td>
<td>11,016</td>
<td>56.38</td>
</tr>
<tr>
<td>2015</td>
<td>12,666</td>
<td>64.84</td>
</tr>
<tr>
<td>2016</td>
<td>14,932</td>
<td>76.43</td>
</tr>
<tr>
<td>2017f</td>
<td>18,000</td>
<td>92.12</td>
</tr>
<tr>
<td>2018f</td>
<td>20,000</td>
<td>102.36</td>
</tr>
</tbody>
</table>

Sources: (O’Driscoll & Hendrick, 2017) and Construction Industry Federation, 2017 (f= forecast)

The figures for household completions in Table 5 include an element of previously unfinished units, stalled during the construction downturn and finished out more recently. In addition, units which were disconnected from the network for more than two years and then reconnected are also included. As such, housing completions figures may be an overestimation in some cases, but are the best currently available data.

Approximately 34 percent of the available roundwood in the Ireland in 2016 was used for energy generation, mainly within the forest products sector. The use of wood biomass energy in Ireland results in greenhouse gas (GHG) emission savings from the displacement of fossil fuels. The saving in 2016 was estimated at over 0.76 million tonnes of carbon dioxide (CO$_2$) (O’Driscoll & Hendrick, 2017).

Overall, 237,000 m$^3$ of firewood, valued of €34 million, was consumed in Ireland in 2016 (O’Driscoll & Hendrick, 2017), providing a steady and growing outlet for some first thinnings.
Table 6: Volume and value of domestic firewood market in Ireland

<table>
<thead>
<tr>
<th>Year</th>
<th>'000 m³</th>
<th>€ mill</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>214</td>
<td>31.0</td>
</tr>
<tr>
<td>2012</td>
<td>225</td>
<td>32.6</td>
</tr>
<tr>
<td>2013</td>
<td>230</td>
<td>33.3</td>
</tr>
<tr>
<td>2014</td>
<td>235</td>
<td>34.0</td>
</tr>
<tr>
<td>2015</td>
<td>237</td>
<td>34.3</td>
</tr>
<tr>
<td>2016</td>
<td>237</td>
<td>34.3</td>
</tr>
</tbody>
</table>


The 2016 estimates (see Table 6) represent a 61 percent increase in firewood consumption since the 2006 figure recorded by Central Statistics Office (CSO) Household Budget Survey. In addition, firewood is harvested by forest owners for private use and this is not accounted for in current figures.

5.2 Export Markets

The UK is by far the largest single export market in the EU (Forestry Commission, 2017) and is the key market for Irish timber products. In 2016 for example, 6.6 million m³ of sawnwood, valued at £1.41 billion, was imported into the UK. In the same year, apparent consumption (timber used as wood and wood products by people and industries) was calculated at 56.7 million m³ of wood raw material equivalent underbark (Forestry Commission 2017).

Figure 5: Country of origin of wood imports (%) to the UK, 2016

Source: Forestry Commission, 2017

In 2016, Irish exports of wood products reached €380 million, a 7 percent increase on 2015. Wood-based panels accounted for €206 million, with the balance comprising sawn timber (£122m) and paper product exports (O’Driscoll and Hendrick, 2017). The UK is the main market outlet for almost all our exported sawn products and a high proportion of Ireland’s panel board products. The most recent Forestry Commission figures for 2016 show that Ireland supplied 6 percent of the UK sawn products market (involving over 80 percent of Irish sawmill output) while Sweden (43 percent), Latvia (17 percent) and Finland (14 percent) provided the majority of sawn softwood to the UK (Figure 5).

Concurrently, 3.4 million m³ of wood-based panel products, including particleboard & fibreboard, valued at £0.96 billion were imported into the UK in 2016, an increase of 6 percent decrease over 2015 figures. A total of 98 percent of particleboard imports to the UK in 2016 came from within the EU - mainly Germany (23 percent), France (17 percent) and Ireland (14 percent). The EU also supplied the majority of fibreboard imports to the UK market, with Ireland retaining its leading supplier role at 35 percent, followed by Germany (21 percent) and Spain (11 percent) in 2016 (Forestry Commission, 2017). Key export markets for Irish panel wood products are indicated in Figure 6.

Figure 6: Key export markets (%) for panel products manufactured in Ireland (2011-2016)

Brexit and the UK Timber Market

The UK timber products market is subject to price cycles reflecting growth rates in the UK economy. The existing and potential supply of timber products from third countries is also a significant factor which comes into play. Since the Brexit decision, the most acute impact that has occurred is the adverse currency movements which are ongoing. Figure 7 presents the euro-sterling (£/€) relationship between November 2015 and November 2017. The lowest recent value for sterling against the euro was reached on 29th
August 2017 (93 pence) when the value of products sold into the UK had fallen by over 24 percent. Currency related shocks in UK end markets and consequent reductions in end-market prices have flowed upstream through the supply chain to growers and contractors. (Stanley, 2017). The effect on timber prices will be analysed in section 6.

Ireland has long-standing and deep linkages with the UK, and in particular Northern Ireland. The implication of this is that the forest sector, along with the wider agri-sector, is particularly exposed to the potential disruption of Brexit. The Irish Forest and Forest Products Association (IFFPA) in conjunction with Enterprise Ireland recently outlined a number of particular concerns, including those of currency shocks, in a communique to the European Commission’s Taskforce on Brexit.

Figure 7: Euro- Sterling Exchange Rate Jan 2015 to Oct 2017

Source: European Central Bank, 2017

Currency: The depreciation of Sterling against the euro (Figure 7) has already resulted in a significant market shock.

Trade: Trade links to the UK are deep and unique. Barriers would have a disproportionate effect on the sector. The option of diverting forest output to alternative markets is not a viable one.

Transport: The forest sector sends thousands of trucks to the UK each year. It is essential that frictionless borders continue to exist. Significant technological and infrastructure investment may be required should the UK leave the custom union.

All Island Economy: The forest sector operates on an all island basis. Both raw material and timber products move both ways across the border every day. Cross-border supply chains exist that would be difficult to replace. Increased border controls and checks would present unique trade, economic and political risks.

Timber Markets: Ireland and the UK share market and regulatory norms in the production of timber products and their use in the construction market. Any divergence in timber standards between the UK and EU would have a significant effect on Irish grown timber.

Given that Irish timber processors are heavily reliant on exports to the UK, the implications of Brexit for the Irish forest and forest products industry are potentially strongly negative. Currently there is great uncertainty on a range of issues. If sterling weakens further, timber prices would be subject to further pressure. Other concerns include possible future trade tariffs and an increased competitive advantage for EU member states such as Finland and Sweden, who produce slower growing structural timber, with higher strength qualities and end use range. Once the UK triggers Article 50, levels of uncertainty are likely to increase, bringing new risks to the UK and Irish economies (Stanley, 2017), specifically in the construction sector. A slowdown in the UK economy and a consequential reduction in timber demand is also a significant threat.

However, from a positive viewpoint, Ireland is well positioned geographically to capitalise on existing and future markets in the UK, which imported sawnwood products to the value of £1.4 billion in 2016 (Forestry Commission, 2017). While there may be early signals of a slowdown, there has been strong growth in the UK construction market over the last 2 years. Exchange rate impacts have also been offset by significant volume demand and strong growth in the Irish construction sector.

It is essential that the Irish forest sector maintains high quality, unhindered access to its most important market. This outcome is critical for the Irish forest sector and must form the core outcome to future Brexit negotiations (IFFPA, 2017).

6. Timber prices

6.1 Coillte Timber prices

Timber prices fluctuate with demand and supply each year as is illustrated using Coillte standing timber prices. Coillte is the dominant supplier of logs to the processing sector which it sells through its timber sales electronic auctioning system as well as contract sales. The standing timber price is
that price paid to the forest owner by the buyer for the timber standing in the forest. The buyer then incurs the costs of harvesting and extraction.

Figure 8 shows quarterly Coillte contracted standing sales (€/m³) for selected average size categories between quarter 4, 2014 and quarter 2 2017. Timber prices are recorded in terms of 16 categories of average tree size (volume). For simplicity of analysis, palletwood and sawlog timber assortments are represented by the 0.225 to 0.274 m³ and 0.500 to 0.599 m³ average size categories respectively. Sales of smaller logs (pulpwood and energy wood) are not represented in Coillte data.

Figure 8: Coillte quarterly contracted standing sales: Q4 2014 to Q2 2017

There is a trend towards a general reduction in log prices in the second half of 2016, notably in larger log sizes, linked to the aftermath of the Brexit decision. Medium to large sawlog prices were reported down by approximately 16% in quarter 3, 2016 over the same period in 2015 (Magner, 2016). Contact with timber buyers suggests price slippage in 2016 with a weakening sterling and Brexit uncertainties being cited as influences. Prices of sawlog rebounded in the first two quarters of 2017, reflecting buoyancy in the UK construction market. This trend has continued through to the present. The lack of data on prices for palletwood assortments in quarters 3 and 4, 2016 following the Brexit decision, poses difficulty for the analysis. Indications are that 2017 prices for pallet wood were generally over 10 percent lower than equivalent prices available prior to Brexit in 2015.

6.2 Private timber prices

Prices from private timber sales are available for each quarter through the Wood Price Quarterly (WPQ) collated by University College Dublin in conjunction with the Irish Timber Growers Association (ITGA). While the availability of private timber sale data has improved with the introduction of the WPQ, the larger volume of Coillte sales makes their prices more robust than current private sales data. Coillte prices are representative of larger sale lots than the private sector.

Figure 9 shows quarterly private standing prices (€/m³) for selected average size categories between quarter 4, 2014 and quarter 3, 2017. While this price data is based on a much smaller sample, it includes some pulpwood prices (represented here by average tree size category up to 0.074 m³) from the private sector which are absent from the Coillte price data. While price data for sawlog assortment is absent for three of the four quarters of 2016, the overall trend of a reduction during 2016 and a rebound in sawlog prices during 2017 is evident. This mirrors the equivalent pattern for Coillte prices.

Figure 9: Private quarterly roundwood prices: Q4 2014 to Q3 2017

Although there is evidence of a limited increase in palletwood prices after quarter 2, 2016, they are still well short of those prices achieved in 2015, prior to the Brexit decision.
While trends for larger diameter timber are difficult to evaluate due to gaps in reported data, prices have tended to be cyclical reflecting supply/demand scenarios. There is less of a discernible pattern in the small log sizes which show variability over the period but generally lower over the second half of 2016 and into 2017. The influence of sterling fluctuations is not as strong for small sized logs, especially in markets such as firewood and energywood.

On-going private forest prices are indicative and can fluctuate according to factors such as region, forest type, harvest type, timber quality and access in the prices offered for private timber sales. The Irish Farmer’s Association timber price survey (August/September, 2017) reports a 10% improvement in price for large sawlog (Table 7). A minimal increase was reported for other products, including pulpwood, stakewood and palletwood, depending on local market conditions.

![Table 7: Reported IFA private timber sale prices €/m3, as of Sept. 2017](Image)

<table>
<thead>
<tr>
<th>Product</th>
<th>Length</th>
<th>Diameter</th>
<th>Standing /m3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firewood</td>
<td>3.1(varied)</td>
<td>varied</td>
<td>6-12</td>
</tr>
<tr>
<td>Energywood</td>
<td>2-3</td>
<td>5 to 14</td>
<td>3-8</td>
</tr>
<tr>
<td>Pulpwood</td>
<td>3</td>
<td>7 to 14</td>
<td>3-8</td>
</tr>
<tr>
<td>Stakewood</td>
<td>1.6</td>
<td>7 to 14</td>
<td>12-16</td>
</tr>
<tr>
<td>Palletwood</td>
<td>2.5-3.7</td>
<td>14+</td>
<td>19-36</td>
</tr>
<tr>
<td>Sawlog</td>
<td>4.9</td>
<td>20+</td>
<td>44-58</td>
</tr>
<tr>
<td>Hurley butts</td>
<td>1.3</td>
<td>20+</td>
<td>400-550</td>
</tr>
</tbody>
</table>

Source: IFA Farm Forest Market Report, August /Sept 2017
Note: Prices should be viewed as indicative, not absolute

### 7. Factors influencing timber supply and demand

#### 7.1 Long term Supply and Demand

In 2016, the Council for Forest Research and Development (COFORD) updated its timber supply forecast to 2035 for the entire island of Ireland, to include both private and public forests. The total net realisable volume (the estimated roundwood volume that will potentially be available to the end user) will increase from 3.95 million m³ in 2016 to 7.86 million m³ in 2035 (Phillips et al., 2016). This significant increase in roundwood supply volumes is forecast to come almost exclusively from privately-owned forest in the Ireland (IRL) and primarily in the larger size assortments (Figure 10).

As can be seen from Figure 10, any real increase in the timber volume produced in Ireland to 2035 will involve the mobilisation of the private forest timber resource. In contrast, the Coillte Roundwood Supply Forecast 2011-2025 projected an increase in the thinning volume and a decrease in the clearfell area and volume in the period 2021-2025 for the Coillte timber resource (Coillte, 2011).

Private sector volume production is predicted to increase steadily, reaching 1.32 million m³ in 2020 and 3.21 million m³ by 2026 (Phillips et al., 2016). Combining the Coillte and privately-owned net realisable timber forecasts for 2020 (4.67 million m³) will still result in a significant shortfall, if the increased demand for roundwood of 6.03 million m³ by 2020 is realised (Phillips, 2011 & Phillips et al., 2016). It is estimated that the gross demand for wood biomass will increase almost two fold, to 3.084 million m³ in 2020, if the stated 2020 targets for renewable energy are realised.

![Figure 10: Forecast of Total Net Realisable Volume Production to 2035](Image)

Source: All-Ireland Roundwood Production Forecast 2016-2035 (COFORD, 2016)

UK Construction output for 2017 is expected to be higher than previously thought, at 1.6%, surpassing the previous estimate of the Construction Products Association (CPA) of 1.3%. Forecasters at CPA believe the UK construction sector will expand just 0.7% in 2018. This is reported as the slowest rate of increase in six years and downward revision from its previous estimate of 1.2% (CPA, 2017). An increase in infrastructure activity and private housing activity are expected to be the primary drivers of growth which will help offset a predicted sharp fall in the commercial and industrial sectors. Growth for 2019 is currently projected to be 1.8% but given the unprecedented economic and political uncertainties, risks around short and longer term
forecasts are uncertain (CPA, 2017). A forecasted increase in domestic demand for construction timber is likely to take some pressure off exports in the medium term (Magner, 2016).

7.2 Renewable energy market

The current driver for policy in renewable energy is the European Renewable Energy Directive (2009/28/EC) which sets out targets for 2020 on an EU basis. The target for Ireland is for renewable sources to account for 16 percent of gross final energy consumption. To this end, the government has set targets of 12 percent heat and 40 percent electricity to come from renewable sources by 2020. Forestry has a significant role to play in supporting Ireland’s approach to land-based climate change mitigation and its transition to a low carbon economy by reducing dependence on fossil fuels.

It is anticipated that the proposed Renewable Heat Incentive (RHI) scheme will be launched in 2018 (AgriLand, 2017). The proposed scheme is expected to offer price support to cover the additional cost of producing a unit of output from a renewable technology as compared to a fossil fuel alternative (IFFPA, 2016). This incentive can help facilitate the environment for renewable energy to achieve its potential.

In 2016, the output of the forest-based biomass energy sector grew by 22 percent over 2015 to 1.58 million m³. This was mainly driven by a substantial increase in the use of wood biomass in Bord na Mona, Edenderry, Co. Offaly (currently including imports) (O’Driscoll and Hendrick, 2017). It is calculated that by 2020, 2.2 million m³ of wood fibre will be potentially available (Phillips et al., 2016). These figures are predicated on the mobilisation of the private timber resource, sourced primarily from farmer-owned forestry.

Approximately 34 percent of the roundwood used in Ireland was used for energy generation in 2016, mainly within the forest products sector. The use of wood biomass energy in Ireland results in greenhouse gas (GHG) emission savings from the displacement of fossil fuels. The saving in 2015 was estimated at over 0.6 million tonnes of carbon dioxide (CO₂) (O’Driscoll & Hendrick, 2016).

It is important to recognise that small sized roundwood suitable for energy uses is also the main raw material for board manufacture. According to COFORD Wood Mobilisation Group, (2015), product optimisation and increased harvesting intensity will increase biomass supply, but a sustainable annual harvest will remain a finite resource.

8. Certification

Certification is a means of confirming that wood products have been sourced from well managed forests; providing sustainable environmental, social and economic benefits. It aims to re-assure (potential) consumers of the origin of wood used in timber products. To enable the export of Irish private timber, certification is gradually becoming a necessity as private timber gradually moves from pulp to pallet wood and sawlog categories.

Private forest owners may need to consider participation in group certification due to the cost involved. Group certification can provide a cost-effective option for private forest owners in demonstrating Sustainable Forest Management as well as facilitating better access to timber markets. In November 2016, the Forest Service, DAFM, awarded a tender for an important pilot project to help facilitate group certification in Ireland. Two KTGs are currently involved in the certification pilot project which is due for completion in May 2018. It is intended that experience from the latter will assist in developing a group certification template for private forest owners as well as providing an insight into the key issues involved and targeting wider application.

Meeting certification standards involves chain of custody recording and compliance with environmental and social principles. There will be a financial cost attached to certification, both in terms of administration and changes in management practices. Although certification may not translate into higher timber prices, it will provide better access to national and international markets thereby providing a competitive advantage. It remains to be seen how the EU’s Timber Regulation (EUTR) and Brexit will impact on certification schemes.

9. Biotic threats

9.1 Forest Health

The biotic threat potential to the national timber resource is a constant, as exampled by three fungal-based diseases outlined below. Horizon scanning for future potential risks is an area that merits significant attention in the future and this remains a focus area for Teagasc.
Sudden oak death
In 2010, the Irish Forest Service first detected sudden oak death (*Phytophthora ramorum*) on Japanese larch. These trees were showing extensive dieback from the crown and down the stem. At the end of 2015, the disease had been confirmed in 47 Japanese larch sites in Ireland. Under current plant health policy, *P. ramorum* control has resulted in the removal of more than 1,300 ha of larch forests on the island of Ireland (DAFM, 2015b). An updated report is currently being compiled to include data from 2016 which will shortly be available. As with Ash, larch species are currently suspended from the Forest Service, DAFM approved planting list.

Ash dieback
Ireland’s first instance of ash dieback disease caused by the fungus *Hymenoscyphus fraxineus* (previously known as *Chalara fraxinea*) was confirmed in October 2012 in Co. Leitrim. Since then, the Forest Service has been carrying out nation-wide surveys year-on-year and sampling of ash plantations to identify the extent of the disease and to implement appropriate control measures. To date, over 967 ha of infected ash plantations have been cleared and have been either replanted or in the process of being replanted with alternative species under the Reconstitution Scheme (Chalara Ash Dieback) (Forest Service, 2017).

As of 31st July 2017, the current total findings of the disease for forestry plantations was 384, with positive forestry samples distributed over 24 counties. New findings have widened the general geographic distribution of the disease and the presence to a greater or lesser extent of the disease is confirmed in all counties of Ireland (DAFM, 2017b).

It remains the Forest Service policy to seek to mitigate the most adverse environmental and economic impacts of the disease, both on the national forest estate and individuals forest owners. To that end, the Forest Service is prioritising control actions and associated financial support on slowing down the rate of spread of the disease and is focusing on the requirement of any large scale removal and appropriate replanting on younger plantations. Ash sites are now classified as being in one of three categories, according to top height, diameter and age criteria. This determined the clearance requirement and appropriate support scheme(s) which may also incorporate tending and thinning under Woodland Improvement Scheme, as appropriate.

Dothistroma Needle Blight
Dothistroma Needle Blight (DNB) is a disease that can be caused by the two fungal pathogens, *Dothistroma septosporum* and *Dothistroma pini*. DNB was found in Ireland for the first time during September 2016 (DAFM, 2016c). Generally the disease will only cause mortality where the infections levels are high for successive years.

In Ireland approximately 10 percent of the forests are pine, mostly lodgepole pine with the remainder being made up of Scots pine, Monterey pine and Corsican pine. Sitka spruce the most common species in commercial forests in Ireland is deemed to have a low susceptibility to the disease. The Forest Service is currently surveying for DNB presence within pine forests and in pine-producing nurseries.

The diseases outlined have both direct and indirect effects on timber supply and demand which include the cost of eradication/containment, the opportunity cost associated with suspended or restricted the planting of specific tree species and the price effect on a diminishing supply of a particular species. It is likely that the long term biotic threat will increase, partly due to increased levels of free trade & personal travel and the possible increase in disease risk due to climate change.

10. Carbon Sequestration
Forestry offers significant potential to sequester carbon dioxide, thereby offsetting greenhouse gas (GHG) emissions from other sectors of society & industry and contributing to climate change abatement. Forestry can contribute to GHG abatement through a range of measures.

Forest products usage for bioenergy generation
The use of wood biomass energy in Ireland results in GHG emission savings from the displacement of fossil fuels. The saving in 2016 was estimated at over 0.76 million tonnes of carbon dioxide (CO₂), up almost 22 percent on the 2015 level of 0.63 million tonnes. (O’Driscoll & Hendrick, 2017).

The output of the forest-based biomass energy sector grew by 22 percent over 2015 to 1.58 million m³ during 2016. In 2017, it was forecasted that 2.5 million m³ of wood fibre is potentially
available, with a similar figure for 2018 (Phillips et al., 2016).

**Afforestation**
Under the 2016 EU Commission Effort Sharing Regulation proposals, currently under negotiations, Ireland has the potential to contribute 2.7Mt CO₂ equivalent per annum through LULUCF (land use, land use change and forestry) activities in order to meet its reduction emission requirements over the period 2021-2030 (DCCAE, 2017). This is based on a combined contribution of net afforestation, over a 30 year historical period as well as cropland and grassland management.

Including fossil fuel displacement, the sequestration potential for forestry is estimated to equate to 4.2 Mt CO₂ equivalent per annum by 2030, falling to 1.6 Mt CO₂ equivalent per annum by 2050 (Teagasc Working Group on Greenhouse Gas Emissions, 2013). Research suggests that the national carbon sequestration potential of forestry may fall after 2035 due to the decline in afforestation rates after 1997 (Hendrick and Black, 2009).

**Optimising forest productivity**
Targeted species selection offers the potential to optimise afforestation schemes in order to maximise their carbon sequestration potential. For example, average growth rates for Sitka spruce (P. *sitchensis* Bong. Carr) can be increased from 17 to 21 m² per hectare per annum by planting trees on land previously in traditional agricultural usage (Farrelly et al., 2009). Appropriate forest management practices can also influence carbon mitigation. Carbon sequestration by forests is largely determined by gross primary productivity and, as such, is strongly influenced by growth rates, species and management interventions (Chen et al. 2014).

**11. Outlook for 2018 and beyond**
It is critical that afforestation levels are increased in 2018 and subsequent years if adequate progress is to be made towards the National Strategic Plan target to expand forestry to 18% of the land area by 2046. While most new planting will continue to occur on farmer-owned land, afforestation by non-farmers is set to increase, partly in response to common afforestation premium rates for both groups. Without achieving the twin objectives of a sufficiently high afforestation rate and a sustainable harvesting rate, the resultant medium-term supply shortfalls mean that there is a risk that demands of both our export driven timber processing sector and our expanding biomass sector will not be met. Teagasc, in conjunction with the forest industry are actively promoting sustainable afforestation up to 2020 and beyond. It is anticipated that changes in the Mid-term Review of the Forestry Programme and addressing of appropriate barriers to facilitate landowner decisions on afforestation can also have a positive effect on planting levels.

The harvest of timber from first and subsequent thinnings is likely to continue to be the major component of the wood-based panel (WBP) sector and the growing wood biomass sector. It is crucial that appropriate thinning be conducted on suitable private forestry plantations. Teagasc, in co-operation with all sectors of the forestry industry, is seeking to mobilise the private forest thinning resource through dissemination of research, training and the building of familiarity with and confidence in the harvesting and marketing of the timber resource. The empowerment of private forest owners through a range of knowledge transfer events and initiatives, capacity building and a sense of ownership is central to the realisation of the private timber resource production potential and to the optimisation of ecosystem services.

While domestic sawmilling demand is forecast to increase by 3.5 percent year-on-year between now and 2020, the sawmilling sector will continue to be dependent on its strong presence in the highly competitive UK market, as well as in Europe. The export market accounted for 81 percent of the total sawn-timber production and 86 percent of wood-based panel board in 2015 (IFFPA, 2015) and this situation is likely to continue into the future. The potential consequences of Brexit and its impact on the timber export market are very unclear at this stage.

Engagement with timber buyers provides insights into the continued demand for timber to meet the on-going requirements of the processing sector. Enhanced timber prices can be paid for well managed forests with good quality timber, adequate road access and felling licences in place, proximity to markets, and economically advantageous plantation size. The on-going development of forest owner groups/clusters will continue to help facilitate additional thinning and harvesting capacity and supply. The current Forest
Service-supported pilot Knowledge Transfer Group (KTG) scheme is testing the feasibility of a future KTG Scheme for forestry. The aim of this proposed scheme, modelled on DAFM’s existing KTGs for beef, sheep and other sectors of agriculture, is to increase the level of forest management activity among participating forest owners and to increase their awareness of the value of their forests. The on-going pilot project, to develop a group certification template for private forest owners, is an important initiative also funded by the Forest Service.

The wood energy market continues to develop as technologies are adapted or introduced to optimise the contribution of forestry to the Bioeconomy. The anticipated two fold increase in demand for wood biomass to 3.084 million m$^3$ in 2020 (Phillips et al., 2016) presents a significant challenge to existing timber processing sectors. Other non-timber benefits of forestry such as ecosystem services, tourism and recreation have potential added-value in the longer term.

In 2017, investment packages in relation to the trading of semi-mature forest properties continue to emerge. These include propositions on the forward selling of timber harvest rights. This is a new development in the private forest sector and may involve a range of investment scenarios and options for private forest owners (Irish Farmers Journal, 2016). A robust economic analysis of such investment scenarios is central to exploring the merits of this expanding forest investment sector. In certain cases, interest in semi-mature plantations may provide options to address landowners concerns over the perceived long production cycles and reduced asset liquidity associated with forestry.

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