



NUI Galway
OÉ Gaillimh



Whitaker
Institute

Agriculture Sectoral Overview



**Galway City and County Economic
and Industrial Baseline Study**

AGRICULTURE SECTORAL OVERVIEW

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Our Approach¹

Our approach in undertaking this overview of the agriculture sector was to take a global and national perspective before focusing on the regional and local level. One of the main limitations we faced preparing this sector review is the lack of quality and reliable data at the local level. The framing of the global and national level overviews against publicly available local data provides a basis and context to consider the future of the in Galway City and County.

¹ The information contained in this overview has been compiled from many sources that are not all controlled by the Whitaker Institute. While all reasonable care has been taken in the compilation and publication of the contents of this resource, Whitaker Institute makes no representations or warranties, whether express or implied, as to the accuracy or suitability of the information or materials contained in this resource.

Executive Summary Overview of the Agriculture Sector

Global Overview

- There are 1.5 million indigenous farmers feeding the world's population.
- There are more people engaged in farming than any other profession in the world.
- 32 hectares is the average farm size in Europe.
- The global grain market is highly concentrated and dominated by four main companies.
- To meet the estimated crop needs of 2050, global production may need to increase between 60% and 70%
- The global market for fertilizer is 180 million tonnes with growing industry consolidation
- The EU accounts for 16% of global meat production and the market is predicted to grow at 14% over the next 10 years due to an increased demand for beef in the Middle East and Asia.
- Some 620 billion litres of milk was produced in 2013, with 10 countries producing 57% of this milk production.
- There is a 5% increase in milk production predicted in the EU by 2024.
- EU policies are focused on minimizing market distortions, refraining from the use of export subsidies, sustainability and termination of EU sugar production

National Overview

- Ireland is the most expensive country in the world to buy farmland.
- The operating surplus increased by 2% in 2013, with milk output increasing by 25.5% and cattle output decreasing by 1.1%.
- Dairy (26%), food processing (15%) and beef (14%) are the top three primary areas of business for Irish agribusinesses.
- 80% of total dairy and beef production is exported with the UK being the leading export market accounting for 69% of Ireland's exports.
- The top 2 cereal productions are spring barley and winter wheat.

- Ireland is the 4th largest beef exporter but the average cattle farm income has declined from €19,183 in 2011 to €15,667 in 2013.
- Some 80% of a 5.4 billion milk pool is processed by five dairy companies and the average dairy income increased by 31% in 2013 compared to 2012.

Regional and Local Overview

- There are 13,445 farms in Galway, 14,730 average work and labour units, €13,852 is the average labour output and 615,877 total hectares
- Galway has the highest number of farms in the West of Ireland with an average farm size of 25.8 hectares.
- There is a trend in the number of large farms increasing while the number of small farms is decreasing.
- 65% of farms in Galway are for beef production.
- There has been a 55% decrease in specialist dairy farms since 2000 and 33% decrease in mixed grazing livestock farms.
- The average output of farms in Galway (€13,852) is 54% less than the State's average output (€30,726) in 2010.
- Over 65 year olds are the largest cohort of farm holders and 34 % of farm enterprises do not generate sufficient income.
- Economically viable farms increased from 27% in 2010 to 35% in 2011.
- Some 380 farms produce cereals with 280 farms producing spring barley.
- Fertilizer spreading costs is greater in Galway than other counties.
- There were 11,247 cattle farms in 2010, with 420,205 cattle and 24, 928 being dairy cows.
- Galway has 6.3% of total cattle stock in Ireland, 2.3% of Ireland's dairy cow stock and has the most cattle in the State after Cork.
- After Donegal, Galway has the most sheep in the State at 576,463 sheep
- Galway has the most goats in the State.
- There are 3,916 sheep farms, 60 pig farms, 810 poultry farms (the largest number after Cork in the State).
- There are 151 milk producers in County Galway and the sixth largest number of dairy cows in the sector.
- There are 10 farmers' markets ranking Galway number four in the State after Dublin, Cork and Kerry.

- Agricultural education has been provided in Mountbellew Agricultural College since 1904.

Global Overview of the Agriculture Sector

Global Overview

Introduction

Global population growth and the increase in the global middle classes are generating substantial demand for food, in particular, protein-rich foods. Due to the increase in wealth in Asia, the global middle class is predicted to triple from 1.8 billion to 3.2 billion in 2020 and to 4.9 billion by 2030 with the total global population increasing to 9 billion by 2050 (Yeuh, 2013). The globalisation of the agriculture industry has given rise to a small number of companies being established as industry superpowers. For example Fonterra is the world's largest dairy processor, processing 21.6 billion litres of milk per year out of a global pool of 620 billion litres. JBS is the global leader in beef processing, slaughtering 500,000 cattle per week. To put this to scale, the entire country of Ireland slaughters on average 28,000 cattle per week (KPMG, 2014).

Global Overview

1.1 Global Farms

There are approximately 1.5 billion indigenous farmers feeding the world's population. There are more people engaged in farming than any other profession in the world. The average farm size in Asia is 1 hectare, while in Australia it is 3,500 hectares and in the US it is 200 hectares. Some 98% of farms in China are 2 hectares in size accounting for 198 million farms while in India 82% of farms are less than 2 hectares accounting for 98 million farms. Table 1 shows the average global farm sizes with Europe's average farm size at 32 hectares with 30 % of farms being less than 2 hectares (KPMG, 2014).

Table 1:
Average Global Farm Size

Region	Average Size (ha)	% <= 2 ha
Australia	3,601	0
Canada	273	7
New Zealand	222	7
USA	178	4
South America	111	36
Europe	32	30
Ireland	32	1
Sub-Saharan Africa	2	69
China	1	98

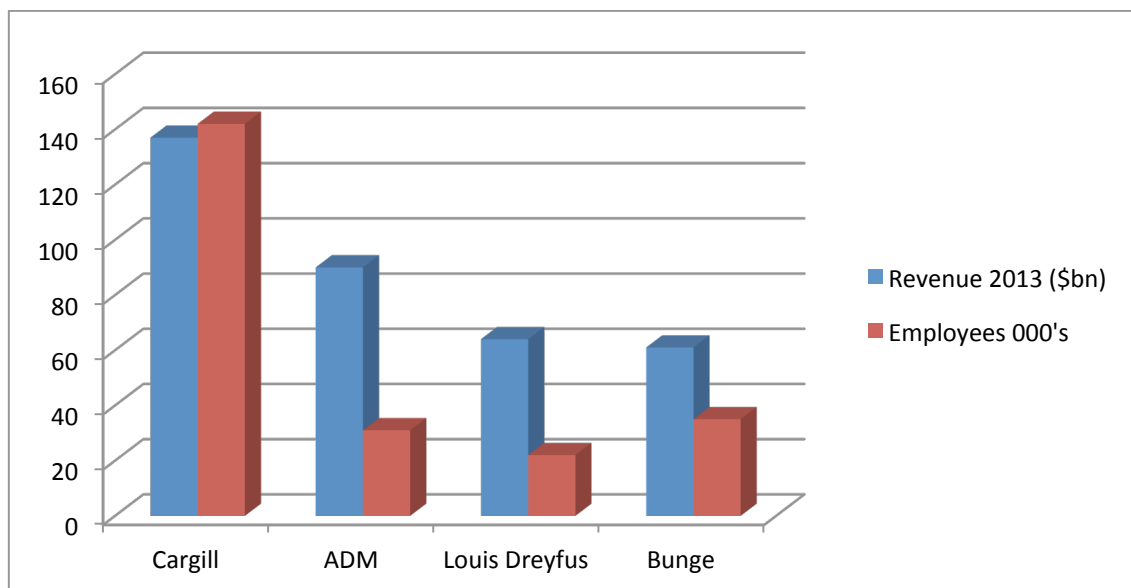
(Adapted from KPMG, 2014)

The agricultural sector has different sub sectors including the grain market, crop yields, the fertiliser market, meat and milk market (EPA, 2012). An overview of each subsector is now provided.

1.2 Global Grain Market

The global grain sector is extremely concentrated and is dominated by four companies – Archer Daniels Midlands (ADM), Bunge, Cargill and Louis Dreyfus. These four companies control between 75% and 90% of the global grain market. They collectively trade half a billion tonnes of commodities per year. Figure 1 illustrates the revenue earned by these four companies in 2013. ADM and Bunge are both publically owned allowing for finance to be raised on the markets. Louise Dreyfus and Cargill on the other hand are privately owned (KPMG, 2104). Global Wheat production for 2014 was 702 million tonnes, which is the second largest harvest after 2013. This 1.9% reduction is concentrated in Canada. International trade is forecasted to decline by one million tonnes. Asia has a continued strong demand for wheat and purchases by the EU are predicted to increase (FAO, 2014).

Figure 1:
Top Four Global Grain Companies, 2013



(Adapted from KPMG, 2014).

1.3 Global Crop Yields

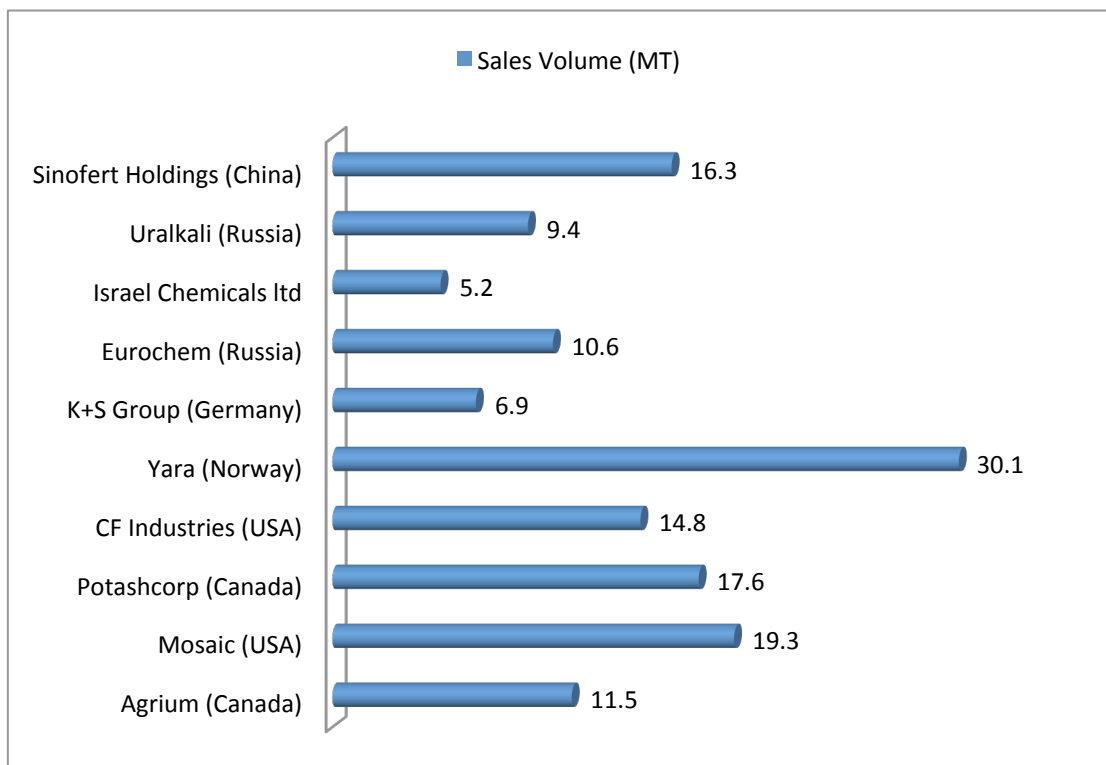
Global crop production has expanded threefold over the past 50 years due to higher yields per unit of land and crop intensification (FAO, 2013). In order to meet the estimated crop needs of 2050 however, global agricultural production may need to increase by between 60% and 110%. Maize, rice, wheat and soybean are currently increasing by between 0.9% and 1.6% per year, which will only increase production by 38%-67% by 2050. In Guatemala; a corn-dependent society, the population is growing while corn production is decreasing (Ray et al., 2013). Agriculture requires the use of 70% of the world's water supply. In order to feed the growing global population, more water will be needed. It is estimated that the world will run out of water before oil. By 2020, between 13% and 15% of global coarse grain and vegetable oil and 30% of sugar cane will have to be used for fuel instead of food (OECD/FAO, 2013).

1.4 Global Fertiliser Market

The fertiliser market is dominated by ten companies controlling half the global market. The global market is 180 million tonnes of fertiliser. Consolidation, like most sectors of agriculture is the general trend. Different nutrients are used in fertiliser production. Nitrogen accounts for

61% of the market. Producers using this nutrient are located close to natural gas supplies. The trade of phosphate products is dominated by phosphate rock and processed phosphate fertilisers. Morocco accounts for half of the world's export of phosphate rock. Phosphate rock and potassium are mined fertilisers and account for 23% and 16% of the nutrient market. China was the largest importer of phosphates up until 2005, when it became self-sufficient, and is now a large exporter. Potassium is essential for all plant life and has a global production of 57 million tonnes, mined by only twelve countries, dominated by Canada and Russia (KPMG, 2014). Figure 2 displays the top ten global fertiliser companies.

Figure 2:
Top Ten Global Fertiliser Companies



(Adapted from KPMG, 2014)

1.5 Global Meat Market

The U.S. and Brazil are the leading meat processors in the world. The meat sector is highly concentrated with there being four companies in the U.S. Tyson, JBS, Cargill and National Beef controlling 85% of the market. Tyson, Cargill and JBS also control 37% of the U.S. pork market. Tyson and JBS also control 40% of the chicken market. Europe in contrast is a fragmented market, with many different companies owning smaller market shares. The EU accounts for over 16% of global meat production. JBS is the largest meat processor in the world, with sales in 2013 reaching \$41.9 billion. It has a weekly slaughter capacity of 500,000 cattle, 350,000 pigs, 125,000 lambs and 60 million chickens (see Table 2). The OECD FAO Agricultural Outlook publication predicts that the EU beef market will increase moderately up until 2016, where it will then experience a marginal reduction over the next few years. The global market in contrast is predicted to increase by 14% over the next ten years due to the increased demand for beef in the Middle East and Asia (Department of Agriculture, Food and the Marine, 2014).

Table 2:
Top Five Global Meat Processing Companies

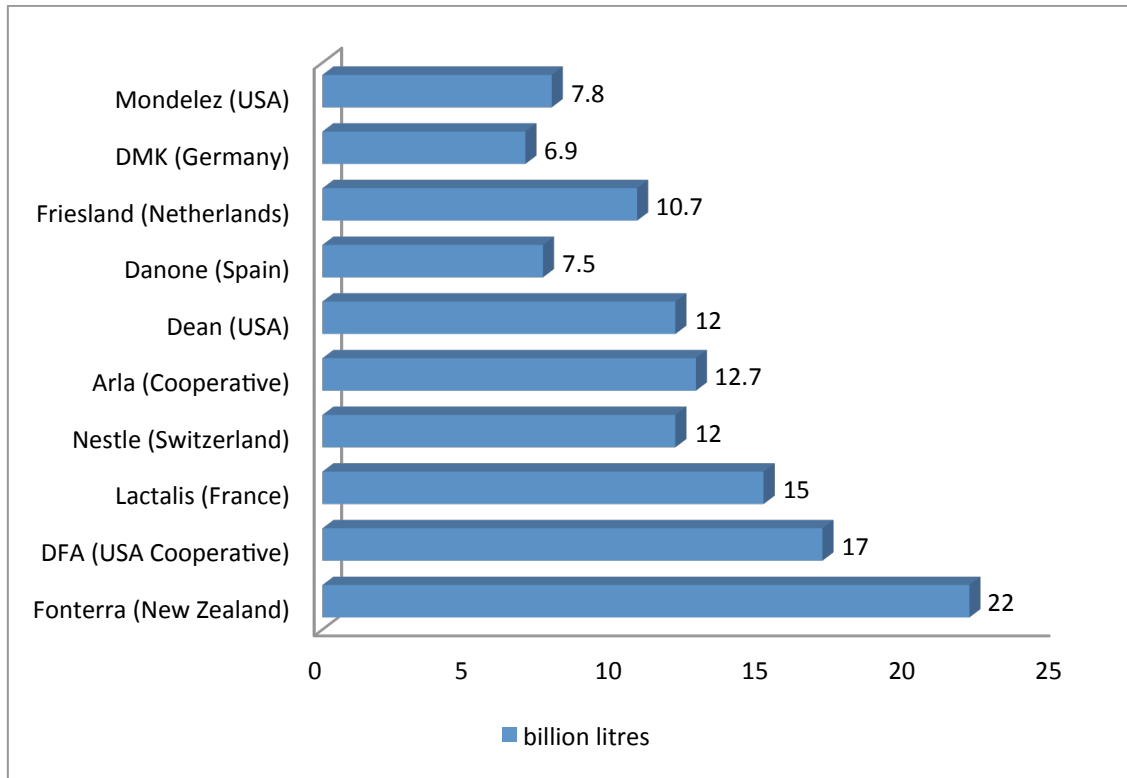
Company	Sales	Employees
JBS (Brazil)	\$41.9 billion	185,000
Tyson (USA)	\$34.4 billion	115,000
Cargill (USA)	\$20 billion	145,000
Brasil Foods (USA)	\$13.6 billion	110,000
Marfrig (Brazil)	\$8.4 billion	90,000

(Adapted from Bord Bia, 2014)

1.6 Global Milk Market

In 2013, 620 billion litres of milk was produced, with ten countries producing 57% of this. Twenty companies handled a quarter of the global milk pool. Figure 3 illustrates the leading milk producing companies. The consolidation of this industry is strategic and decisive due to the commoditised nature of the product, which makes economies of scale necessary (KPMG, 2014). The abolition of milk quotas in 2015 gives rise to a predicted 5% increase in milk production in the EU over the next decade. World and EU dairy prices are forecasted to rise over the next ten years to the westernisation of diets, increased incomes and the demand, especially from the Asian, North African and the Middle Eastern markets (Department of Agriculture, Food and the Marine, 2014).

Figure 3:
Leading Milk Producing Companies with Annual Production



(Adapted from KPMG, 2014)

Arla has an annual turnover of €9.8 billion. It is the sixth largest dairy company in the world. It is the result of a Danish and Swedish merger, processing 90% of the Danish and 66% of the Swedish milk pool. FrieslandCampina is the fifth largest dairy company and processes 60% of milk pool within the Netherlands. This company was also the result of several mergers. Fonterra, with a turnover of \$16 billion is the fourth largest dairy company. It supplies 90% of the New Zealand milk pool. New Zealand is the largest global exporter of milk as Fonterra accounts for 30% of global exports. This company was formed via the merger of two of New Zealand's largest dairy cooperatives. Dairy Farmers America (DFA) has a turnover of \$12.8 billion and is the seventh largest dairy company. The U.S. is the largest milk producer, producing 90 billion litres which is 15% of global milk. It was formed through the merger of four of the nation's largest milk cooperatives. Nestlé and Danone are the largest milk companies by turnover accounting for a combined \$59 billion in sales. These companies purchase their milk from nearby milk processors as opposed to directly from farmers (KPMG, 2014).

1.7 EU Policy Objectives

1.7.1 Minimising Market Distortions

The most dramatic change to the European Union's common agricultural policy over the last 10 years has been the change in direction away from 'coupled' support. Most direct support is now non-trade distorting which is decoupled from production (European Commission, 2015).

1.7.2 Refraining from the use of export subsidies

The systematic use of export refunds, used to bridge the gap between high EU prices and lower world prices has now been decreased to be used only in times of market crisis. As of January 2014 an end was put to the use of all export refunds for products exported to Africa entering into a full economic partnership with the EU (European Commission, 2015).

1.7.3 Sustainability as a Central Component

The new common agricultural policy ensures environment credentials and product quality. Over 60% of the budget is for direct payments and rural developments that will benefit the environment. Sustainable practices such as enhanced efficiency in fertiliser use has decreased greenhouse gas emissions from agriculture in the EU by 24% in the period 1990-2012 (European Commission, 2015).

1.7.4 Termination of EU Sugar Production Quotas

The 2013 common agricultural policy reform stated that sugar quotas will expire in 2017. The EU has provided over €1.25 billion in development assistance to sugar dependent economies to assist them in adapting to the new market through diversification. Sugar imports from the 79 countries bound by the ACP-EC Partnership Agreement have increased from an average of 1.5 million tonnes in 2006 to 2.2 million tonnes in 2014 (European Commission, 2015).

1.7.5 The Economic Partnership Agreements

Under the 'Everything but Arms' initiative, the EU's less developed countries are given duty and quota free access to the EU market aimed at eradicating poverty and enhancing their agricultural production (European Commission, 2015).

1.7.6 EU Biofuels Policy Impacts

The EU biofuels and renewable energy policy ensure awareness of the negativities involved in biofuel production such as food prices. Biofuel imports into the EU are from well-developed agricultural biofuel sectors with avoidance towards countries that have high risk to food security or weak land-use rights (European Commission, 2015).

National Overview of the Agriculture Sector

National Overview

Introduction

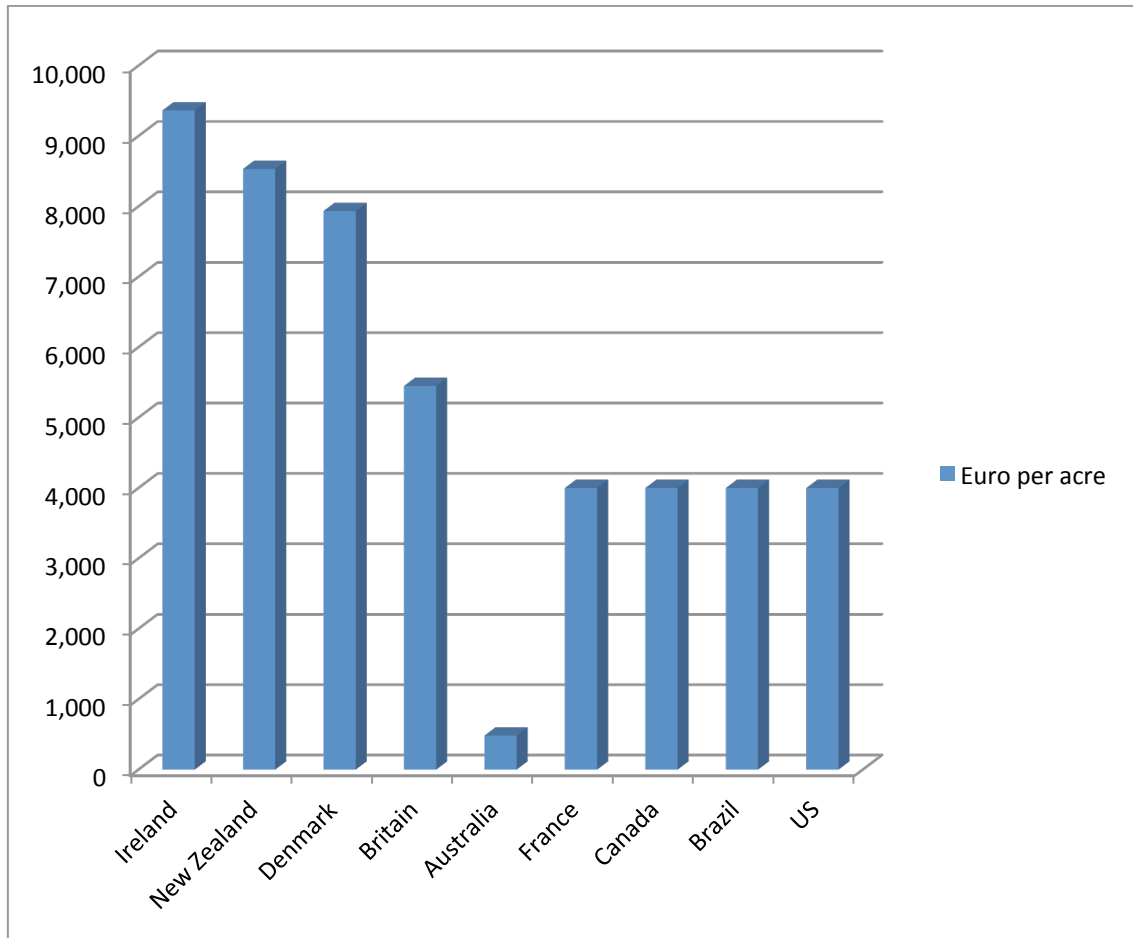
Agriculture is Ireland's largest indigenous industry. It employs 175,300 people (Department of Agriculture, 2014). Growth is strong, employment is increasing and substantial investments have been made.

2 National Overview

2.1 National Farms

Ireland has coveted natural advantages for farming, including fertile soils, temperate climate and a steady supply of rain water. Due to this climate and the moderating effects of the Gulf Stream, ryegrass grows particularly well, and is used for livestock feed. According to a recent survey by the Financial Times, Ireland is the most expensive country in the world to buy farming land; next is New Zealand, followed by Denmark. Figure 4 illustrates the most expensive farmland in the world (Whelan, 2014). This high price is influenced by the EU's abolition of milk quotas in 2015, creating a high demand for dairy land. Irish farmland is generally sold only once in 400 or 500 years, while it is sold every 70 years in France (Whelan, 2014).

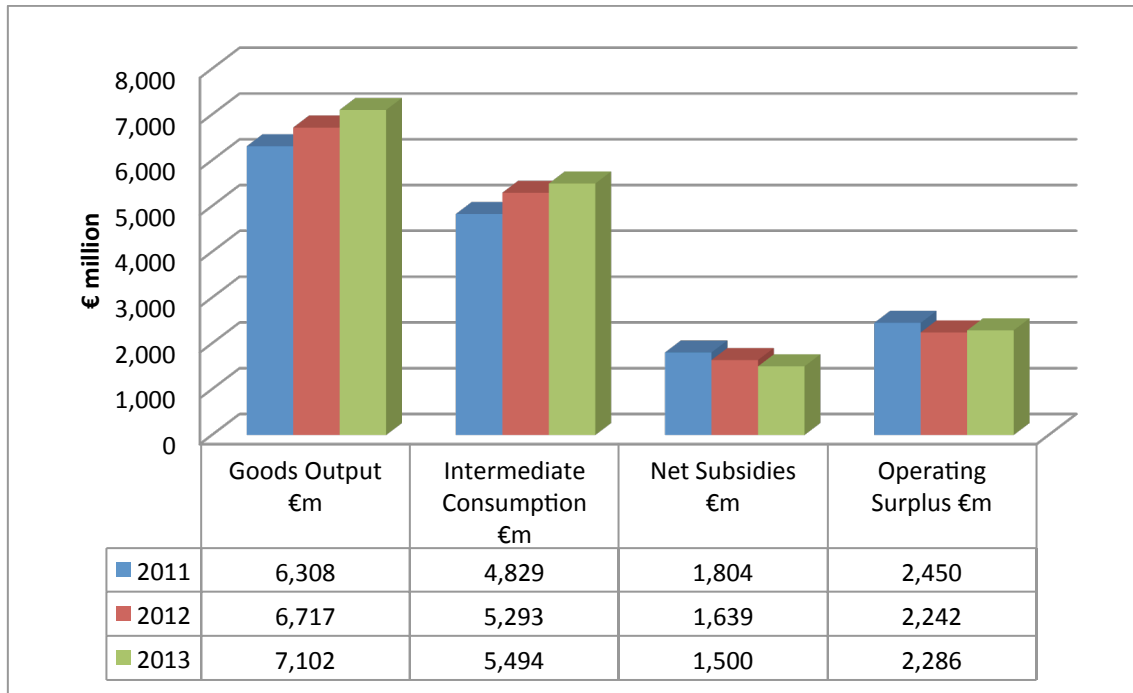
Figure 4:
Farmland Prices, 2014



(Adapted from Whelan, 2014)

The operating surplus (as can be seen in Figure 5) in agriculture in 2013 shows an annual increase of 2%. Goods output at producer prices increased by 5.7% or €385.2 million since 2012. Milk output increased by 25.5%, but cattle output decreased by 1.1% along with cereal output, decreasing by 32.4%. Pig output increased 7.8% and total intermediate consumption increased by 3.8% (CSO, 2014).

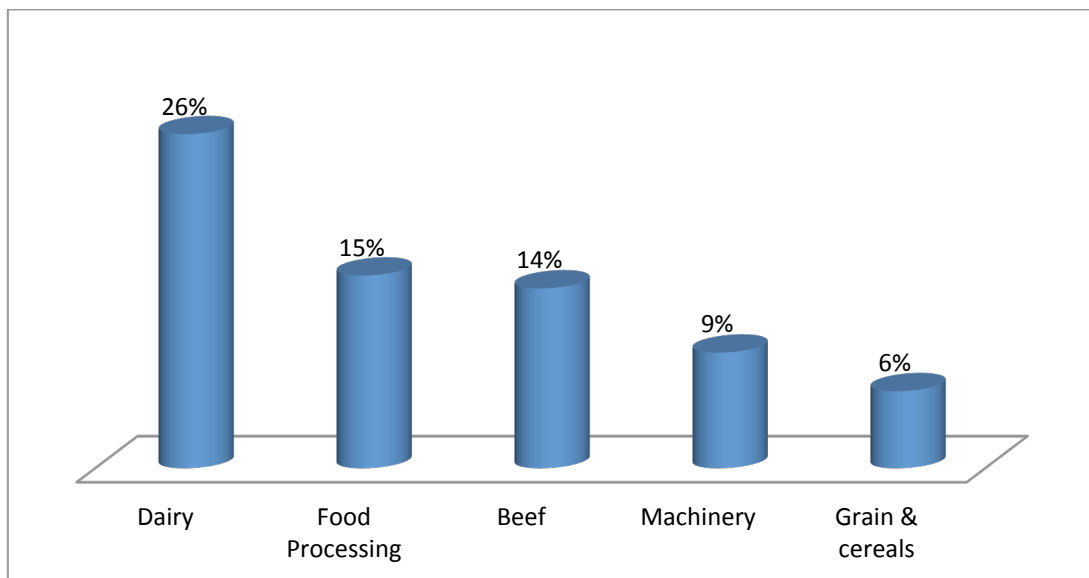
Figure 5:
Operating Surplus and Net Subsidies, 2011-2013



(Adapted from CSO, 2014).

As can be seen from Figure 6, Dairy is the primary area of business of Irish Agribusinesses followed by food processing and beef (KPMG, 2014).

Figure 6:
Primary Areas of Business of Irish Agribusinesses

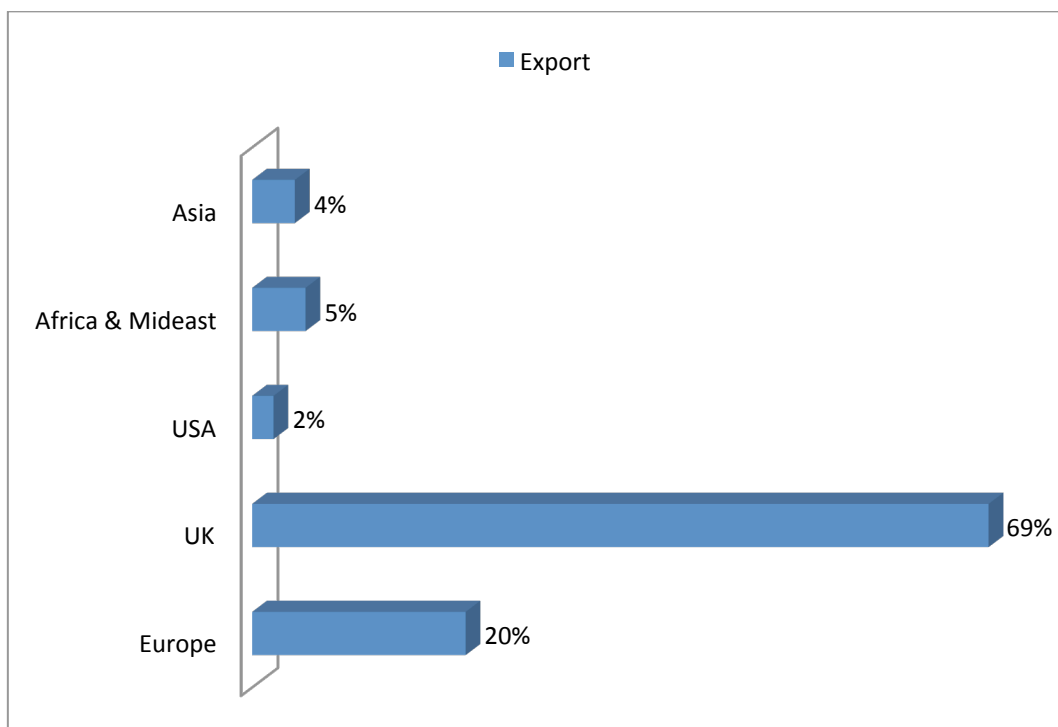


(Adapted from KPMG, 2014).

2.2 National Exports

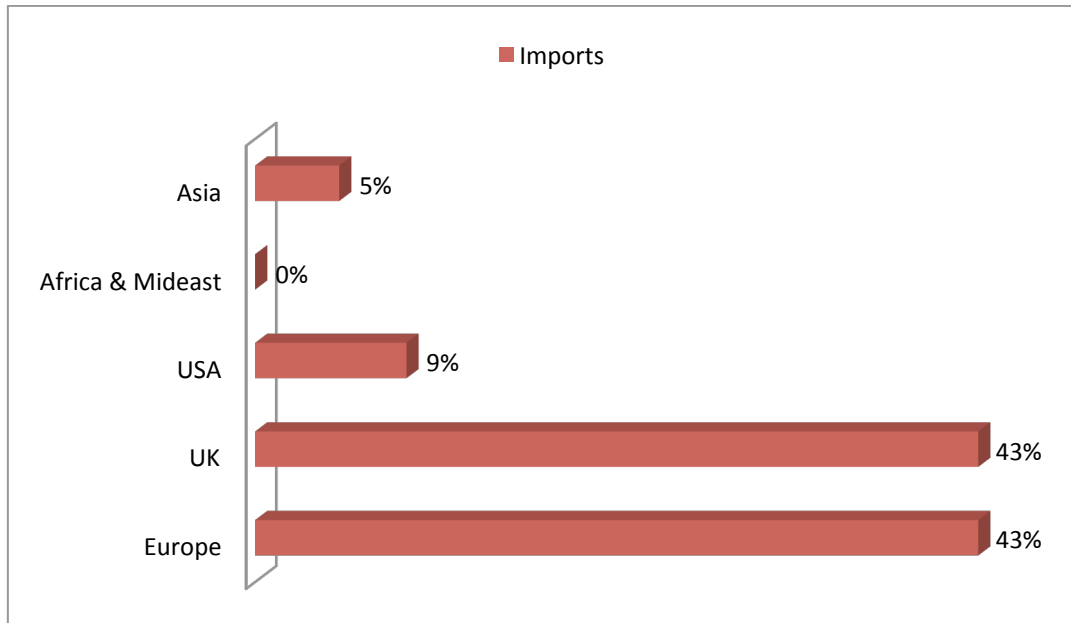
Ireland exports to 46 countries worldwide, exporting over 80% of its total dairy and beef production (KPMG, 2014). Agri-food exports have a 10% share of total exports (Teagasc, 2013). Ireland is the largest net exporter of beef in the world (KPMG, 2014). The UK is the leading export market for agribusinesses accounting for 69% of Ireland's exports, while 20% go to Europe (see Figure 7). The two main import locations are Europe accounting for 43% and the UK at 42% (see Figure 8). As the Euro currency has weakened against sterling it improves the competitiveness of Irish exports to the UK (Teagasc, 2014).

Figure 7:
Primary Export Destinations



(Adapted from KPMG, 2014).

Figure 8:
Main Import Regions

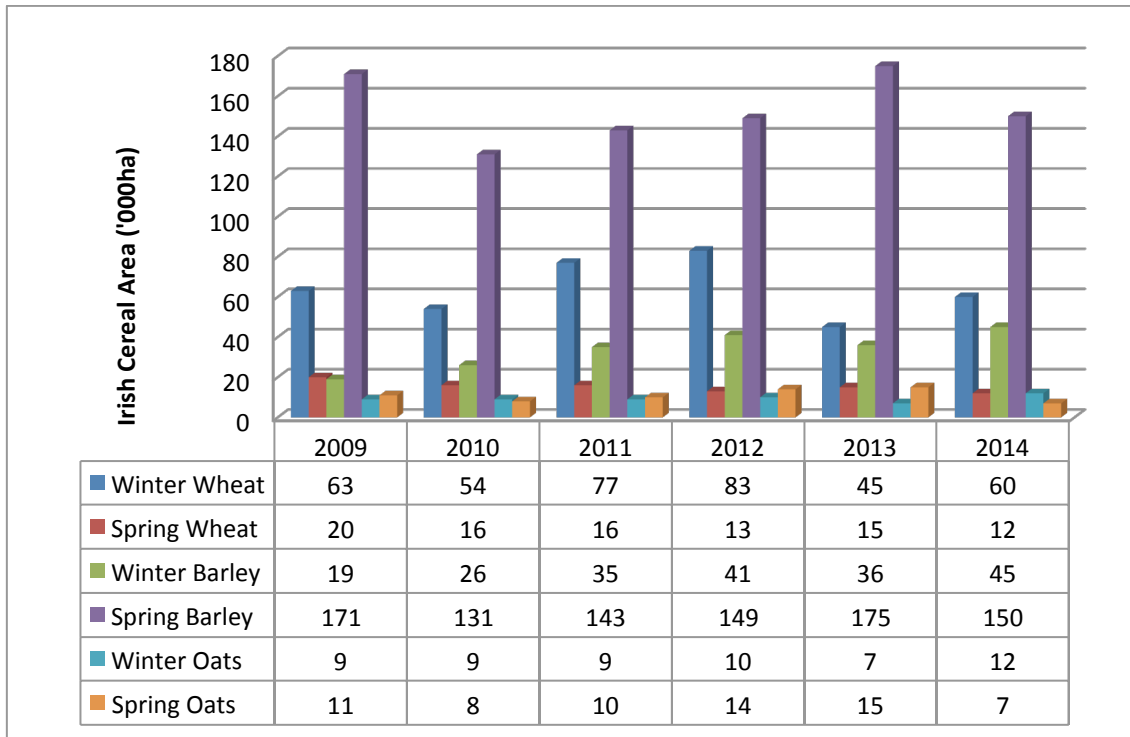


(Adapted from KPMG, 2014).

2.3 National Grain Market

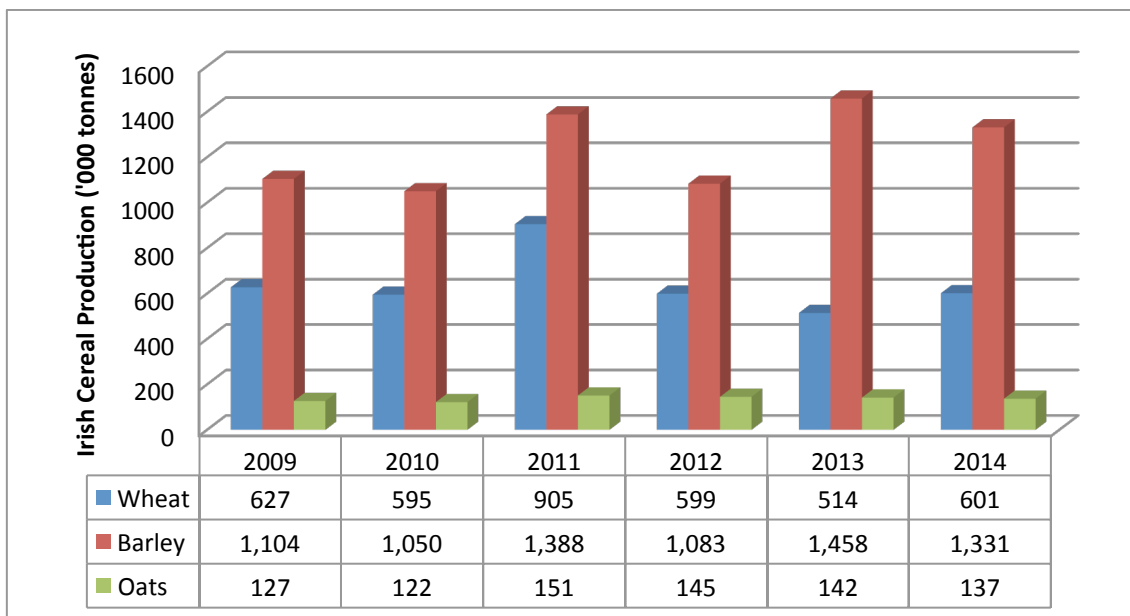
The volume of farmland used for cereal production is illustrated in Figure 9 with 150,000 hectares being used for spring barley and 60,000 hectares being used for winter wheat (Bergin, 2014). Figure 10 displays the Irish cereal production volumes from 2009 to 2014. In 2012 there was a reduction in all grain production due to large amounts of rainfall. The changing and unpredictable climate can have a major influence over grain production in Ireland (Dermody, 2012).

Figure 9:
Irish Cereal Area ('000ha)



(Adapted from Bergin, 2014).

Figure 10:
Irish Cereal Production ('000 tonnes) 2009-2014



(Adapted from Bergin, 2014).

2.4 National Fertiliser Market

Ireland imports the necessary fertiliser nutrients and then blends, packs and distributes them for a profit margin, gained from selling to merchants and co-ops (KMPG, 2014). There are five main fertiliser companies in Ireland who collectively handle 1.3 million tonnes. Approximately 25% of fertilisers used in Ireland are Russian produced or Russian supplied. A trade war between the EU and Russia could sky rocket Irish fertiliser prices (Halleron, 2014).

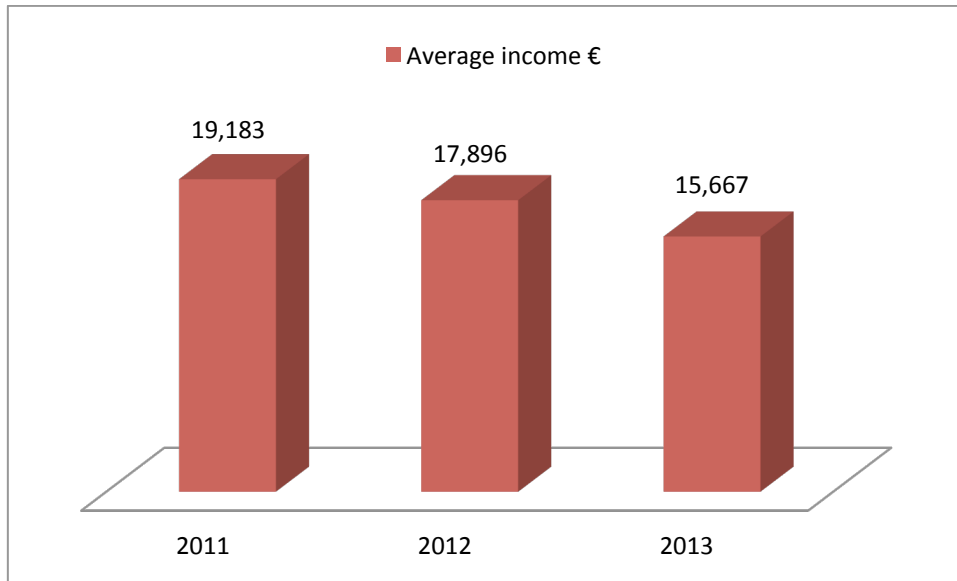
2.5 National Meat Market

Ireland is the fourth largest beef exporter in the world. In 2013, 180,900 cattle and 300 tonnes of beef were exported (CSO, 2013). Ireland is also a large grass-fed lamb producer, exporting 1,653,000 in 2014, which is up 3.5% from the previous year (BordBia, 2014). More than 100,000 farms have a beef enterprise. Ireland exports 90% of beef production. 60% of meat processing is accounted for by three firms – ABP, Dawn Meats and the Kepak Group (KMPG, 2014). Ireland slaughters on average 28,000 cattle per week.

Production of beef in Ireland increased in 2014 and a considerable gap has emerged between Irish factory beef prices and UK prices. The farm profitability is farm specific. While margins for cattle finishers are likely to decline, margins for cattle rearing farms should improve (Teagasc, 2014).

There are approximately 16,700 cattle rearing farms in Ireland with an average family farm income of €9,541 in 2013, which is a 22% reduction on 2012 (Teagasc, 2013b). This reduction was driven by higher costs such as increased feed expenditure. Only 14% of cattle rearing farms produced a farm income of €20,000 or more. Figure 11 illustrates the fluctuating average cattle rearing farm income between 2011 and 2013 (Teagasc, 2013).

Figure 11:
Average Cattle Farm Income, 2011-2013



(Adapted from Teagasc, 2013).

There are approximately 12,650 sheep farms in Ireland with an average family farm income of €11,731 as of 2013. This is a 36% decrease on 2012 due to an increase in direct costs and a reduction in output. Average lamb prices increased somewhat in 2013 from an average of €94 to €95. 31% of sheep farms produce a family income of €5,000 or less in 2013 and 21% earn between €5,000 and €10,000. Only 8% of sheep farms earn an income of €30,000 or more (Teagasc, 2013).

Regarding the pig sector of Ireland, 2013 saw a drop of 1.2% in the total number of pigs. Since cereals account for 75% of pig feed, the increase in cereal prices negatively impact the pig market. It is estimated that as of June, 2013 there was 1,552,000 pigs in Ireland (CSO, 2014b). Ireland has the 16th highest population of pigs in the EU, with Germany having the most at 27.4 million pigs. In 2013, the number of breeding pigs was up 2.5% while non-breeding pig numbers were down by 0.1%. A 6% increase in pig meat prices resulted in a 3% increase in the value of Irish pig meat exports. Exports have been shifting from Continental Europe to international markets. 37% of pig meat exports are for the international market, with China and Russia accounting for approximately three quarters of this trade (Department of Agriculture, 2014).

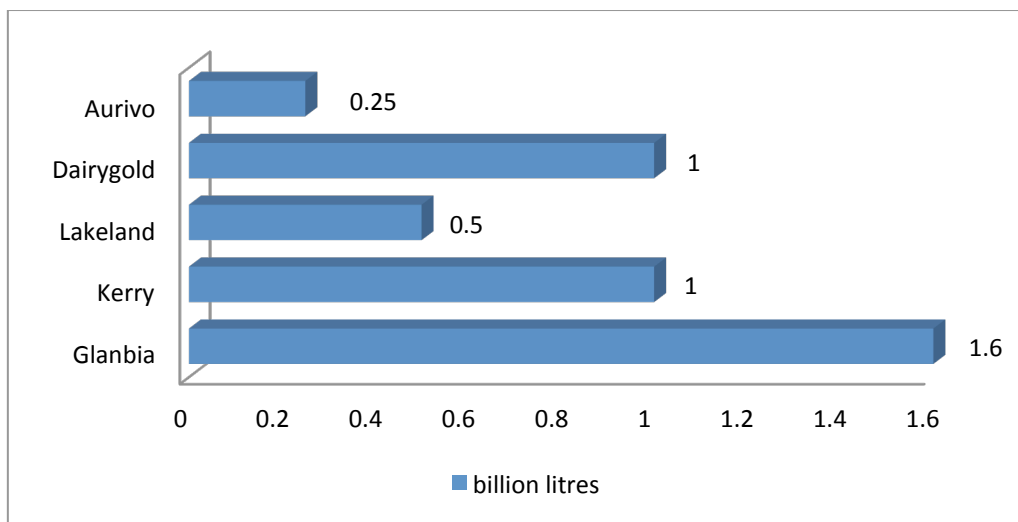
Last year's budget introduced a new Beef Genomics Scheme and this year it is being further developed with a total package of €74 million being provided for the beef sector in 2015. A

payment of €100 per animal for the first 10 animals is to be delivered with the remaining animals being eligible for an €80 payment per animal. This will account for €52 million. The sum of €9 million will fund the Beef Data Programme and a further €6 million will assist farmer participation in the Beef Quality Assurance Scheme. In addition €1 million has been allocated for Beef Efficiency Programme and another €1 million has been allocated to Bord Bia to support the marketing of Irish beef abroad (Department of Agriculture, Food and the Marine, 2015).

2.6 National Milk Market

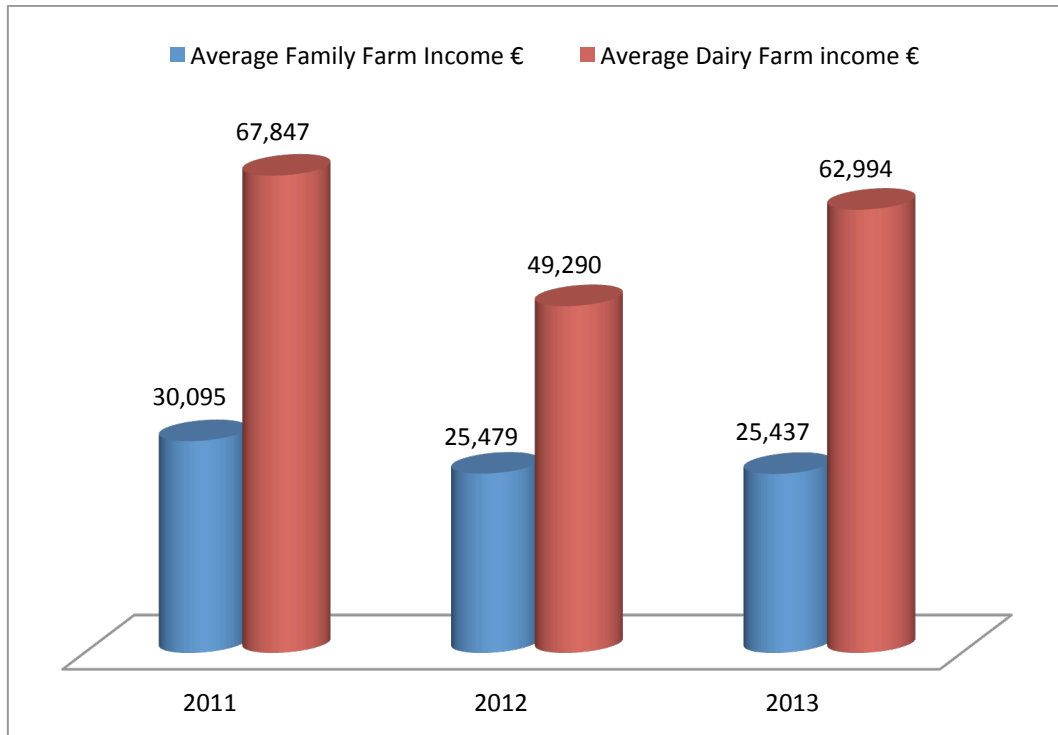
The Irish milk sector is a grass-based production system. Unlike other countries, five dairy companies process 80% of a 5.4 billion litre milk pool. Figure 12 shows the five main dairy companies in Ireland. Finland for example has a milk pool which is half the size of Ireland but has one company (Valio) that processes 85% of the country's milk. Milk levels are forecasted to reach 7.4 billion litres by 2020, allowing for greater dairy export levels to the global market. The Irish Dairy Board, with a turnover of €2 billion was established in 1961 to solely export dairy products. It exports 60% of Ireland's milk accounting for 2.8 billion litres of milk (Irish Dairy Board, 2013). The average dairy farm income increased by 31% in 2013 compared to 2012, while non-dairy farms experienced declines in average incomes (Department of Agriculture, Food and the Marine, 2014). Figure 13 illustrates the average farm incomes of both dairy and non-dairy farms, between 2011 and 2013. The average family farm income increased by 28% in 2013, reversing the decline of 2012 (Teagasc, 2013).

Figure 12:
Primary Milk Producing Companies in Ireland



(Adapted from KPMG, 2014)

Figure 13:
Average Farm Income versus Average Dairy Farm Income



(Adapted from Teagasc, 2013).

2.7 National Policy Objectives

The Food Harvest 2020 is a strategy to chart the direction of agri-food, forestry and fisheries for the 10 years beginning in 2010. Over 200 recommendations and suggestions were made towards which government and private enterprise will work. In addition targets were set, including: increasing the value of primary output of the agriculture, fisheries and forestry sector by €1.5 billion; improving the value added in the sector by €3 billion; achieving an export target of €12 billion; increasing milk production by a half and adding 20% to the value of the beef sector (Department of Agriculture, 2011).

A target to reduce greenhouse gas emissions between 2020 and 2030 was recently settled at reducing emissions by 40% compared with 1990 levels. This enables the future build-up of the dairy sector to be able to proceed without the risk of EU fines (Lynch & Beesley, 2014).

The abolition of the milk quota in 2015 could be worth €1.3 billion and create 15,000 jobs to the economy according to the National Dairy Council, underpinned by a growing global population (Department of Finance, 2014).

Regional and Local Overview of the Agriculture Sector

Regional and Local Overview

Introduction

According to the most recent data source, Galway has 614,877 hectares of farmland (CSO, 2010) with 13,445 farms. The average standard output for farms in Galway is €13,852, while the average for the State is €30,726 with Monaghan and then Louth being the most profitable (see Table 3).

Table 3:
Top Five Global Meat Processing Companies

Region	Total Hectares	Total Farms	Labour Input Annual work units	Avg. Labour Output
Galway	347,123	13,445	14,730	€13,852
State	4,568,938	139,860	162,345	€30,726
Monaghan	106,288	4,565	5,202	€45,534
Louth	60,938	1,676	1,919	€44,837

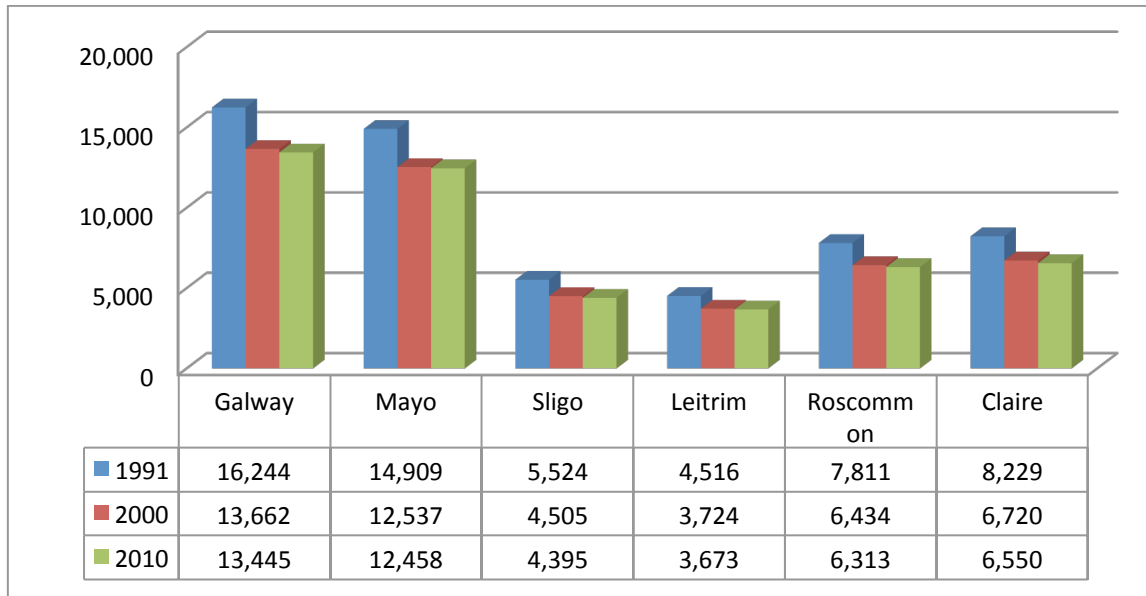
(Adapted from CSO, 2010)

3 Regional and Local Overview

3.1 Regional Farm Sizes and Incomes

As of 2010, Galway has 13,445 farms. Figure 14 compares the number of farms in Galway and its neighbouring counties during the years 1991, 2000 and 2010 (CSO, 2010b). Although all counties' farm numbers have decreased from 1991 to 2010, Galway has always had the largest number of farms in the West.

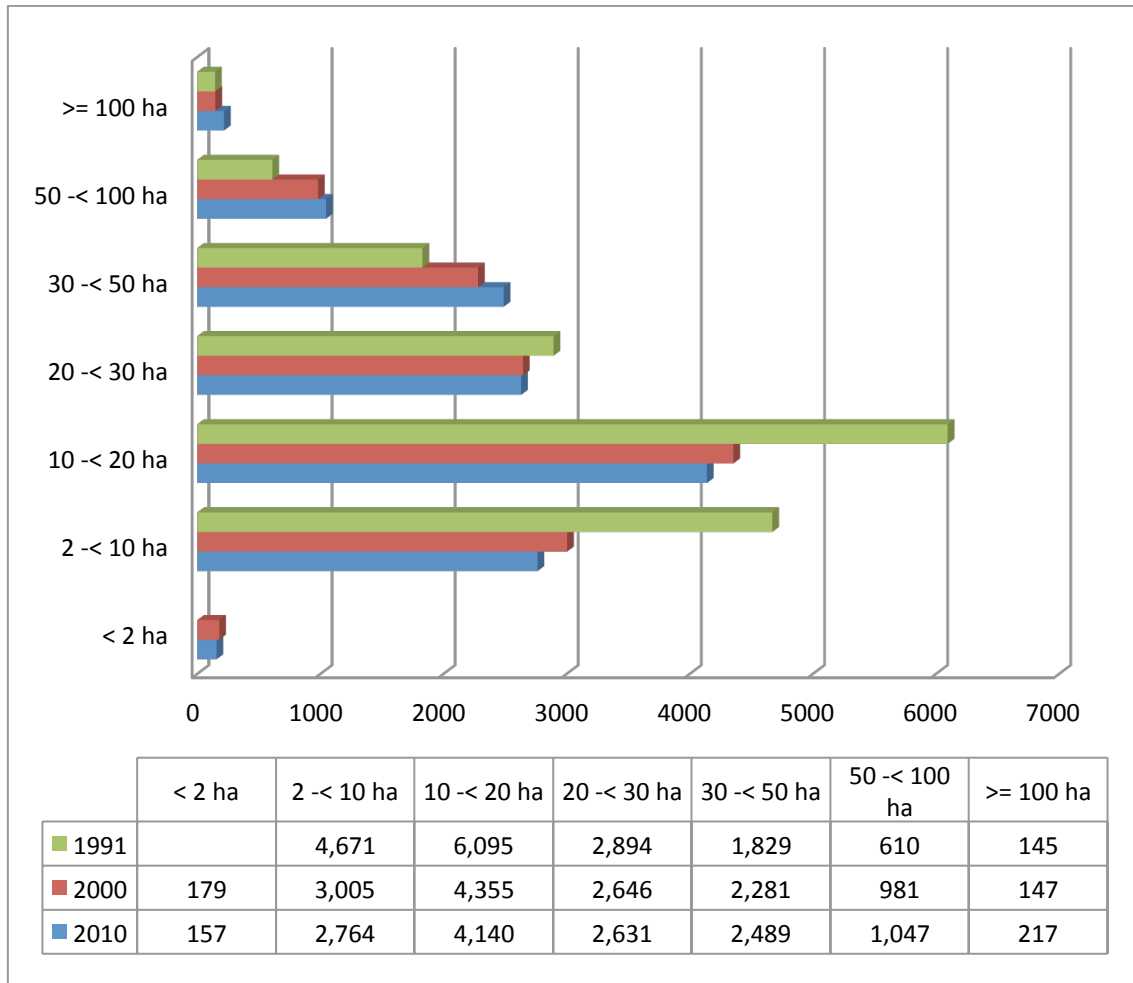
Figure 14:
Number of Farms in Galway and Neighbouring Counties



(Adpated from CSO, 2010b).

The average farm size in Galway is 25.8 hectares. Figure 15 shows the range of farm sizes in Galway. As can be seen from the graph, the majority of farms in Galway are between 10 and 20 hectares, with the fewest amounts of farms being less than 2 hectares followed by 217 farms with greater than 100 hectares. The number of farms greater or equal to 100 hectares has increased from 145 in 1991 to 217 in 2010. Farm numbers between 30 hectares and 100 hectares have also increased in size since 1991. In contrast all farms that are less than 30 hectares have decreased in numbers. In other words the number of large farms in Galway is increasing, while the number of smaller farms is decreasing (CSO, 1991, CSO, 2000; CSO, 2012).

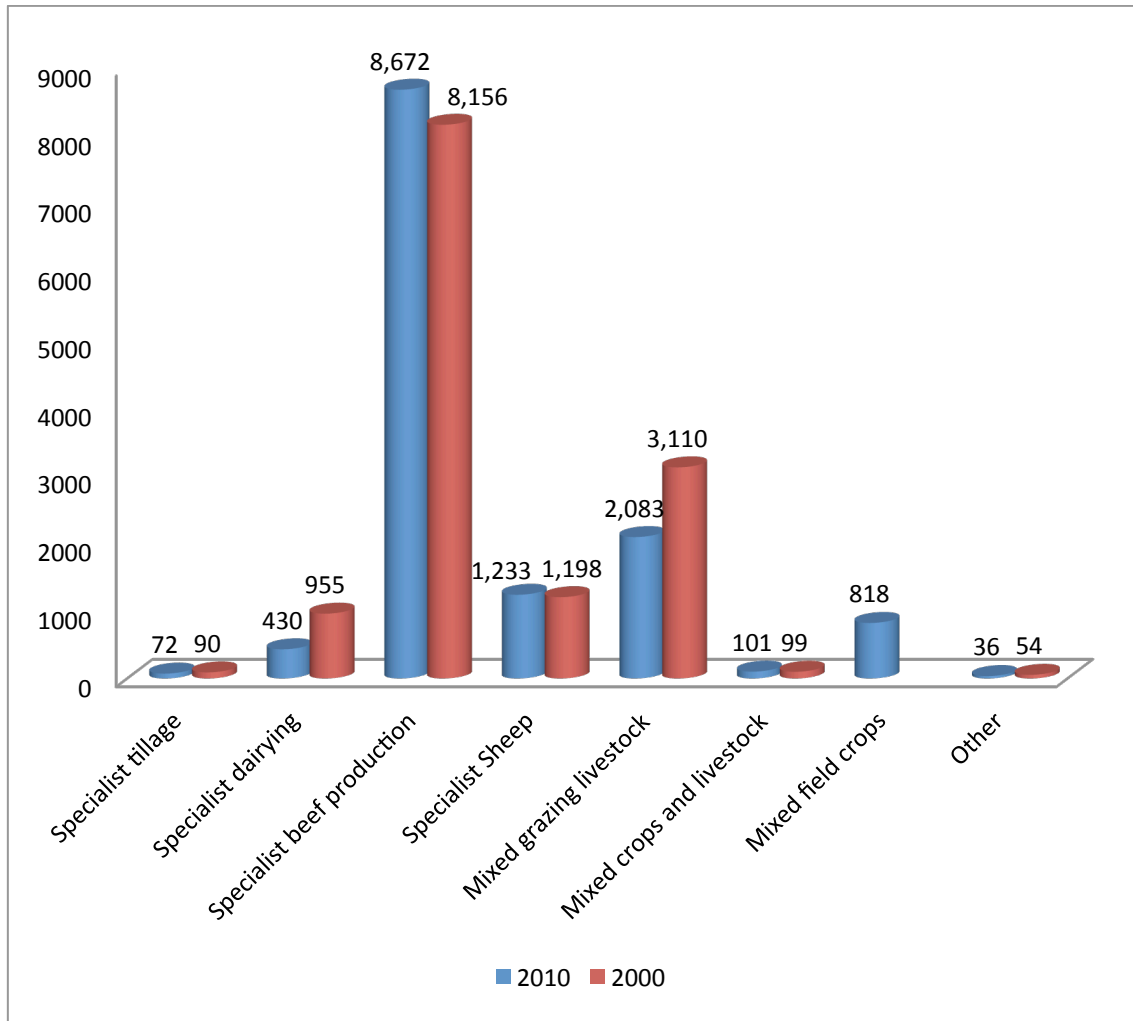
Figure 15:
Number of Farms in Galway Classified by Farm Size



(Adapted from CSO, 2010b; CSO, 2000; CSO, 2012)

With respect to the number of Galway farms classified by type of farm, the large majority of farms in Galway are specialist beef production farms (see Figure 16). In fact 65% of farms in Galway are for beef production. Beef production farms and specialist sheep farms and to a lesser extent mixed crops and livestock farms are the only type of farms to have increased in number over the decade between 2000 and 2010. All other types of farms in Galway have decreased in number during that timeframe. Specialist dairy farms have reduced by 55% since 2000 and mixed grazing livestock farms have decreased by 33% (CSO 2010b; CSO, 2000; CSO 2012).

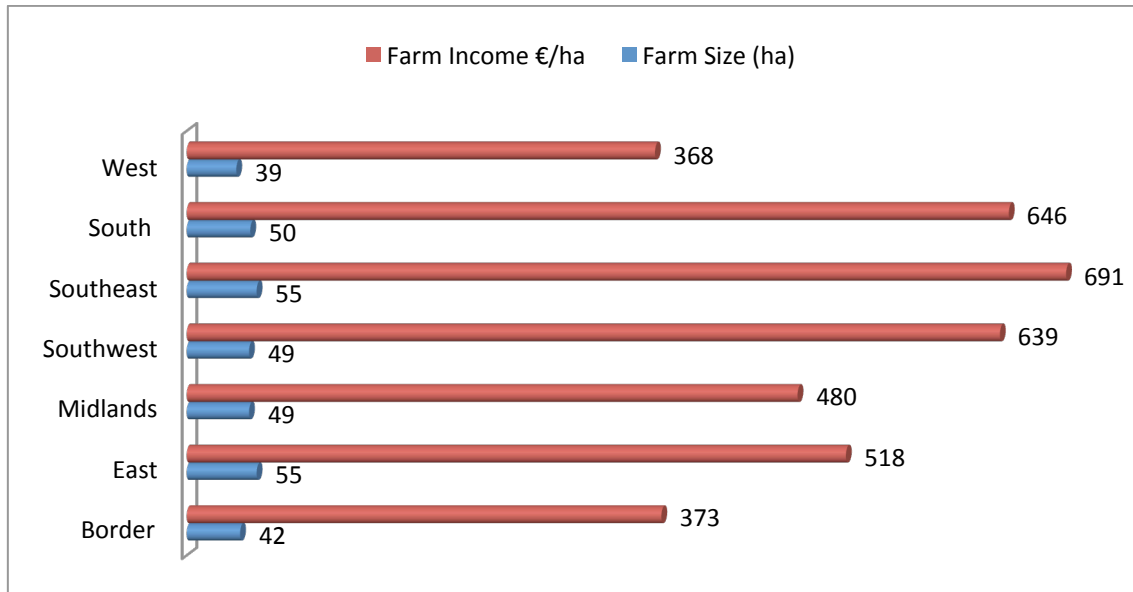
Figure 16:
Number of Farms in Galway Classified by Type of Farm



(Adapted from CSO, 2012; CSO, 2000).

The average farm size in the West of Ireland is 39 hectares, generating an average income of €368 per hectare (see Figure 17). Therefore the average standard output of farms in the West of Ireland is €14,252 (Teagasc, 2013b). The Southeast of Ireland has the largest average farm size at 691 hectares followed by the South. Farms in the Southeast of Ireland in comparison on average generate €38,005.

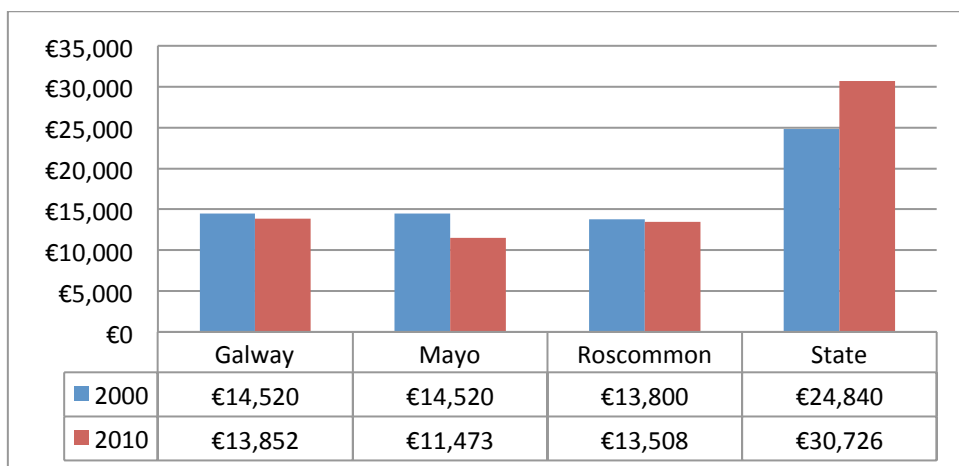
Figure 17:
Regional Overview: Average Farm Income and Size



(Adapted from Teagasc, 2013b).

The average standard output of farms in the West of Ireland is decreasing (see Figure 18). Although farms in Galway generate on average the highest output within the west, the average output of farms in Galway is 54% less than the State's average standard output (CSO, 2012; CSO, 2000).

Figure 18:
Average Standard Output of West Irish Farms, 2000, 2010

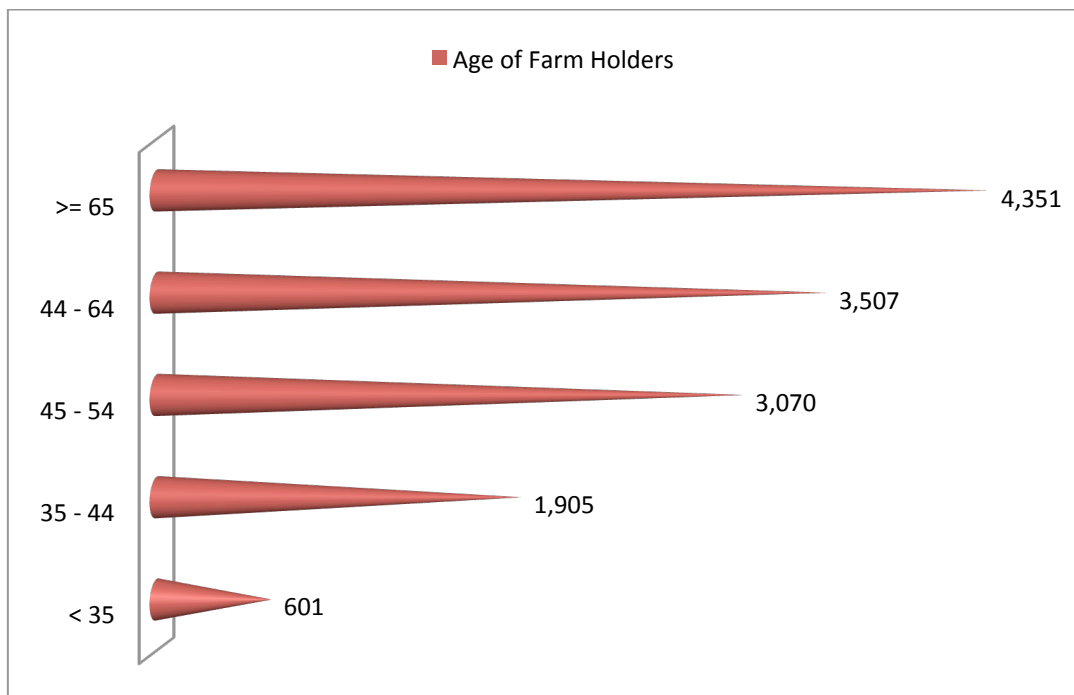


(Adapted from CSO, 2012; CSO, 2000)

The largest cohort of farm holders in Galway is over 65 years old (see Figure 19). There are only 601 farm holders under the age of 35, suggesting that it is a declining industry within Galway (CSO, 2012). Agriculture is a declining industry due to rural poverty. There is need for up-to-date research outlining the extent and nature of rural and farm household poverty (Teagasc, 2014). While the proportion of economically viable farms increased to 35% in 2011 from 27% in 2010, 34% of farm enterprise did not generate sufficient income, whereas 31% were considered as sustainable but due to the presence of an external off-farm income. The most appropriate means of tackling this is to simultaneously support the strategic development and diversification of the local economy through the up-skilling and where necessary re-skilling of farmers (Teagasc, 2014). Local shops and services cannot compete with large shopping centres and unreliable broadband deters enterprises from setting up (Healy, 2014).

The Commission for the Economic Development Rural Areas (CEDRA) is an establishment with the goal of finding the economic potential of rural Ireland and how best to channel funding and resources between now and 2025 (Department of Agriculture, Food and the Marine, 2014).

Figure 19:
Age of Farm Holders in Galway



(Adapted from CSO, 2012).

The average farm size and income differs considerably according to its region. Galway's West region has the lowest average farm income of only €12,864 per farm or €368 per. The West also has the smallest farms with an average farm size of 24.8 hectares and the most farms after the Southern & Eastern regions at 32,216 farms. The Southeast has the most profitable farms with an average income of €50,977 as well as the largest farms at an average of 42.6 hectares (CSO, 2012). This would suggest that the Western region of Ireland needs a strategy of consolidation, where smaller bordering farms in the West merge to create a larger more profitable farm.

Table 4:
Top Five Global Meat Processing Companies

Region	Avg. Farm Size	Total Farms	Most Farm Type	Avg. Income
State	32.7 (ha)	139,860	SBP* (77,738)	€30,726
Galway	25.8 (ha)	13,445	SBP* (8,672)	€13,852
West	24.8 (ha)	32,216	SBP* (20,660)	€12,864
Midland	35.1 (ha)	12,834	SBP* (8,724)	€30,945
Border	26.8 (ha)	28,831	SBP* (16,411)	€23,682
Southern & Eastern	38.6 (ha)	65,679	SBP* (31,943)	€42,482
Mid-West	34.9 (ha)	16,346	SBP* (10,781)	€31,301
South-East	42.4 (ha)	16,660	SBP* (6,798)	€50,977
South-West	36.6 (ha)	22,634	SBP* (9,920)	€42,225

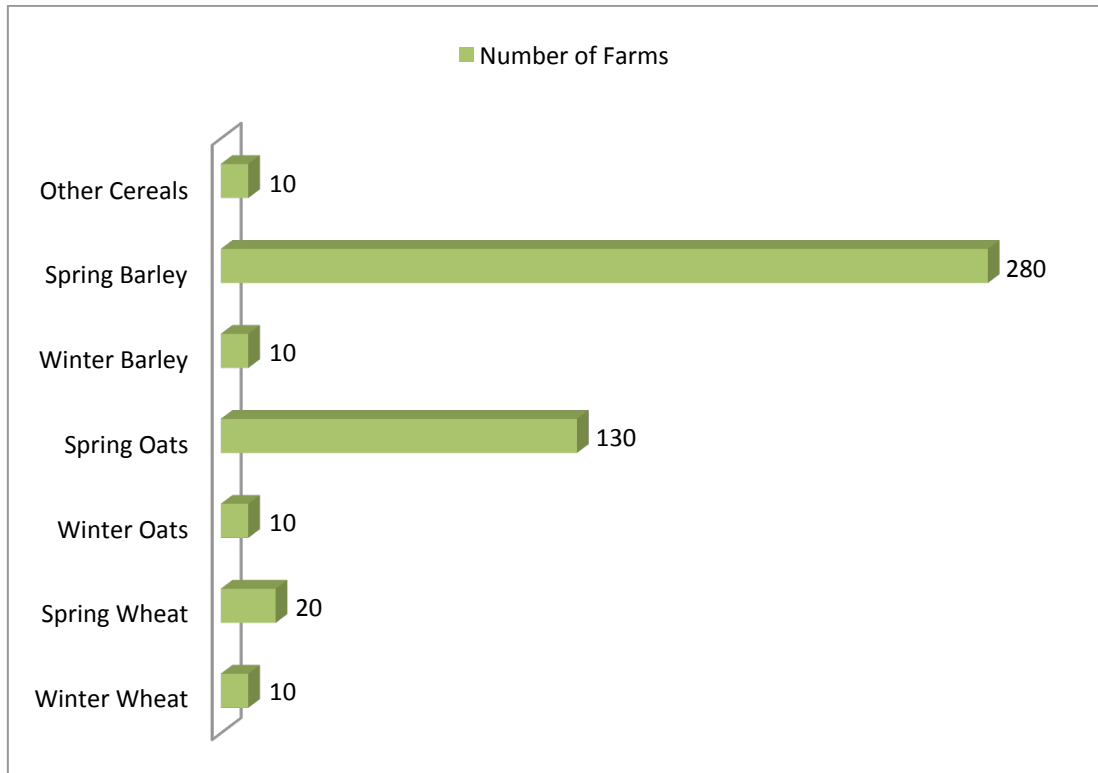
(Adapted from CSO, 2012)

*SBP (Specialist Beef Production)

3.2 Regional Grain Market

There are 380 farms in Galway that produce cereals, with 10 farms that produce winter wheat, while 20 farms produce spring wheat. Some 10 farms produce winter oats and 130 farms produce spring oats. Some 10 farms produce winter barley and 280 farms produce spring barley. Figure 20 illustrates the number of farms growing cereals in Galway. Spring Barley Farms are the most common at 280 farms followed by spring oat producing farms (CSO, 2012).

Figure 20:
Number of Farms Growing Cereals in Galway



(Adapted from CSO, 2012).

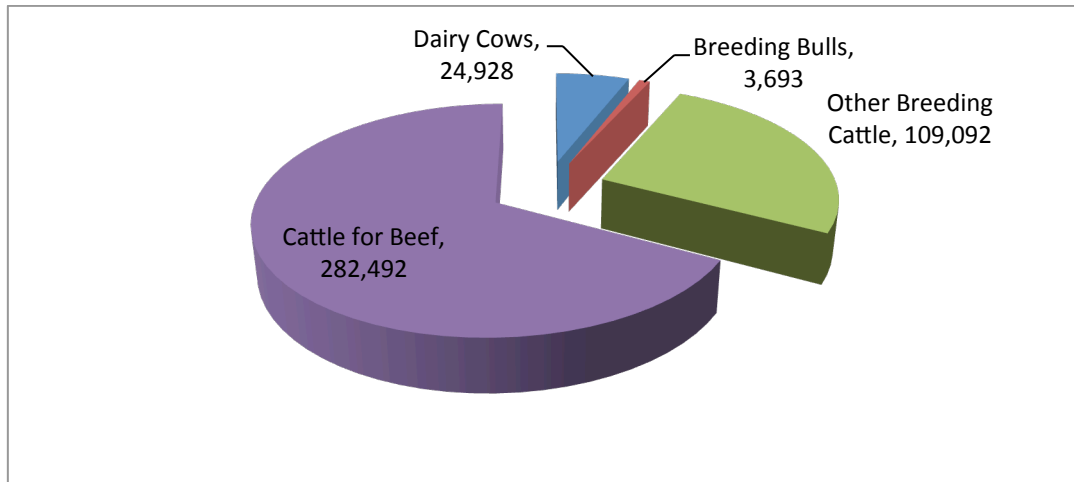
3.3 Regional Fertiliser Market

Fertiliser-spreading costs increased by over 13% over 2011 to a national average of €35 per tonne. Galway, however experienced a greater increase, resulting in fertiliser costing €50 per tonne compared to just €14 per tonne in Kerry. These increasing prices have been influenced by the spiralling diesel costs (McCullough & Brady, 2012).

3.4 Regional Meat Market

Galway has 11,247 cattle farms as of 2010. There are 420,205 cattle in Galway, with 24,928 being dairy cows. Figure 21 shows the percentage of cattle in Galway that are dairy cows (CSO, 2012). The total number of cattle in Ireland is 6,606,585, with the total number of dairy cows being 1,070,755. Galway has 6.3% of Ireland's total cattle stock and 2.3% of Ireland's dairy cow stock.

Figure 21:
Percentage of Cattle in Galway that are Dairy Cows



(Adapted from CSO, 2012).

After Cork, Galway has the most cattle in the State, followed by Limerick and then Kerry. Galway however is sixth on the ranking of most dairy cows, with Cork having 284,050, which is 11 times more than Galway (see Table 5). Even though Galway and Cork have a similar amount of cattle farms, Cork has almost 2 and a half times as many cattle. Galway also has the most breeding bulls in the country after Cork, accounting for almost half of the bulls in the West (CSO, 2012).

Table 5:
Top Five Global Meat Processing Companies

Region	Total Cattle	Total Cattle Farms	Dairy Cows	Breeding Bulls
State	6,606,585	110,995	1,070,755	52,043
West	908,003	26,011	45,062	7,887
Galway	420,205	11,247	24,928	3,693
Cork	990,603	11,595	284,050	6,940
Limerick	388,129	5,330	94,066	2,875
Kerry	323,957	6,455	84,444	3,236

(Adapted from CSO, 2012)

More than a quarter (26.6%) of the national flock of sheep is located in the Western region of Galway/Mayo/Roscommon. Total sheep in Galway comes to 530,267 with an average flock

size of 95 (National Sheep and Goat Census, 2013). After Donegal with 576,463 sheep, Galway has the most sheep in the state. Galway also has the most goats in the country, with 1,160, accounting for 70% of the West's total goat stock. There are 3,916 sheep farms in Galway and even though Mayo has the most sheep farms in the West, Galway has the largest sheep stock (see Table 6) (CSO, 2012).

Table 6:
Comparison of National and Regional Sheep and Goat Statistics

Region	Total Sheep	Total Sheep Farms	Total Goats	Total Goat Farms
State	4,745,424	32,111	10,520	1,203
West	1,262,936	9,868	1,673	250
Galway	530,267	3,916	1,160	100
Donegal	576,463	5,042	385	70
Cork	247,766	1,719	805	100
Kerry	433,546	2,197	723	90

(Adapted from CSO, 2012).

In reference to the regional pig and deer market, Galway has 60 pig farms, allowing for a total of 6,664 pigs. Galway has 10 deer farms, accounting for 411 deer. The West has the fewest pigs in the country but has the largest number of deer. Cavan has the most pigs in the State (332,880), accounting for 50 times as many as Galway, but has only 20 extra farms. Cork in comparison has 39 times more pigs than Galway but has 140 more farms (see Table 7) (CSO, 2012).

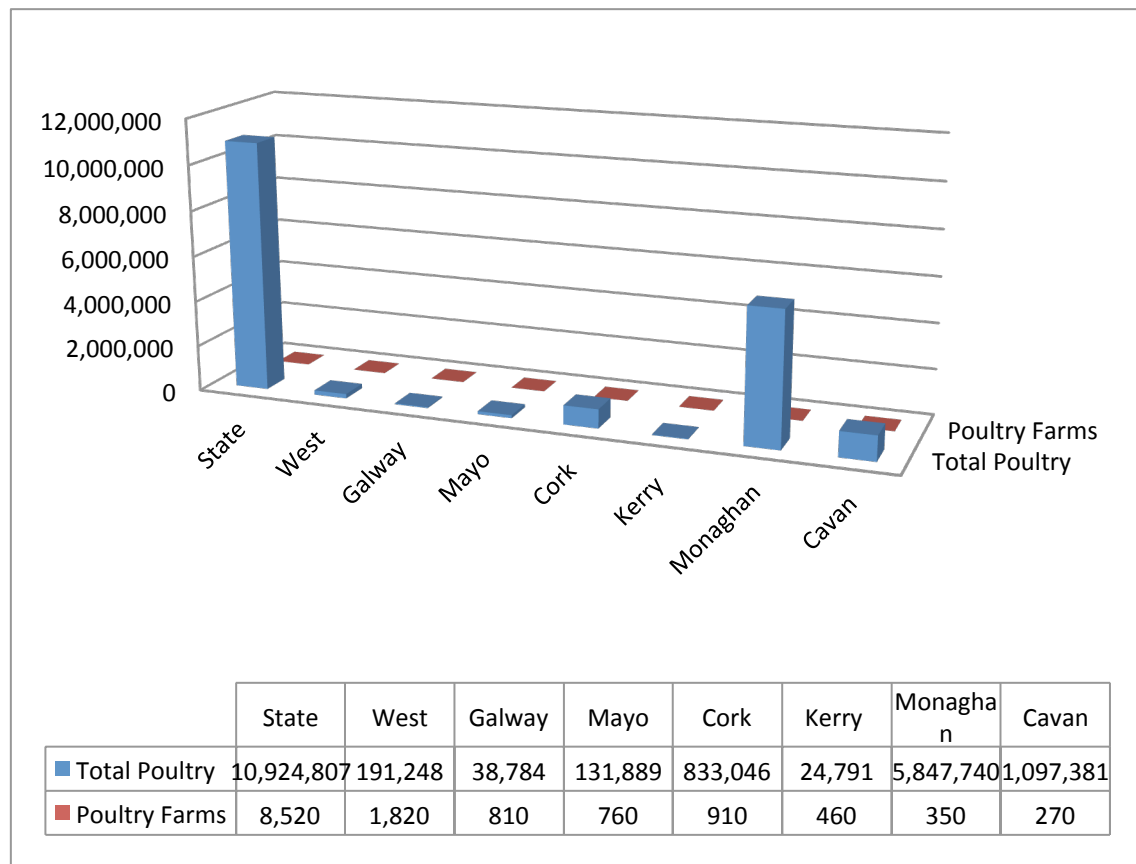
Table 7:
Comparison of National and Regional Pig and Deer Statistics

Region	Total Pigs	Total Pig Farms	Total Deer	Total Deer Farms
State	1,516,291	1,209	5,239	183
West	48,511	180	1,306	40
Galway	6,664	60	411	10
Cavan	332,880	80	149	10
Cork	259,031	200	1,036	30
Kerry	37,681	40	139	10

(Adapted from CSO, 2012).

As of 2010, Galway also has 810 poultry farms with a total of 38,784 poultry birds. Galway has the largest amount of poultry farms in Ireland after Cork, which has 910 farms. Although Cork has the largest number of poultry farms, there are four other poultry farms with more birds, including Monaghan with 5,847,740 birds and Cavan with 1,097,381 birds. In the West, Mayo has the largest number of birds (131,889), accounting for 69% of the West's poultry stock (see Figure 22) (CSO, 2012).

Figure 22:
Comparison of National and Regional Poultry Farms



(Adapted from CSO, 2012).

3.5 Regional Milk Market

There are currently 151 liquid milk producers in County Galway. These producers supply 5 pasteurising plants; Connacht Gold, Kerry, Glenisk and two Arrabawn plants (Galway County Council, 2014). The average milk sales for Galway is 972 million litres, while the national average total milk sales is 4534 million litres (Läpple & Hennessy, 2012).

Arrabawn in Galway was founded in 2001 through the Merger of the Mid-West Farmers Co-op and the Nenagh Co-op. Arrabawn Dairies dates back in the Mid-West for generations through a series of mergers and acquisitions including Oranmore Dairies, and Kilconnell Co-op. In 2004 all liquid milk production for the group was centralised at a new state of the art plant in Kilconnell, Ballinasloe, Co. Galway (Arrabawn, 2015). In 2010 Arrabawn Dairies acquired Dawn Dairies Galway, the Dawn brand is now produced in Kilconnell. Today Arrabawn Dairies is supplied by 120 local dedicated liquid milk farmers and employs 130 people throughout its operations. In 2014 17 Arrabawn suppliers from Galway have recently been presented with The Animal Health Ireland CellCheck Milking Quality award. This award illustrates that improving technical efficiencies can increase profitability on dairy farms up to 500%. With a 109 cow herd example, low efficiency levels would see surplus cash margins of €90 per cow per year, but by enhancing technical performance , returns of up to €480 per cow could be achieved, which is a 500% increase (Tierney, 2014).

Although Galway County has only the sixth largest number of dairy cows in Ireland, the quality of milk produced has won awards. The inaugural Irish Dairy Board (IDB) Dairy Farmer of the Year award was presented to Galway farmers Noel and Bernadette O'Toole in 2010. They own 125 dairy cows on 61 hectares of land. The farm has a quota of 530,000 litres, with a herd average of €105 (Dermody, 2010).

3.6 Sector Development and Support

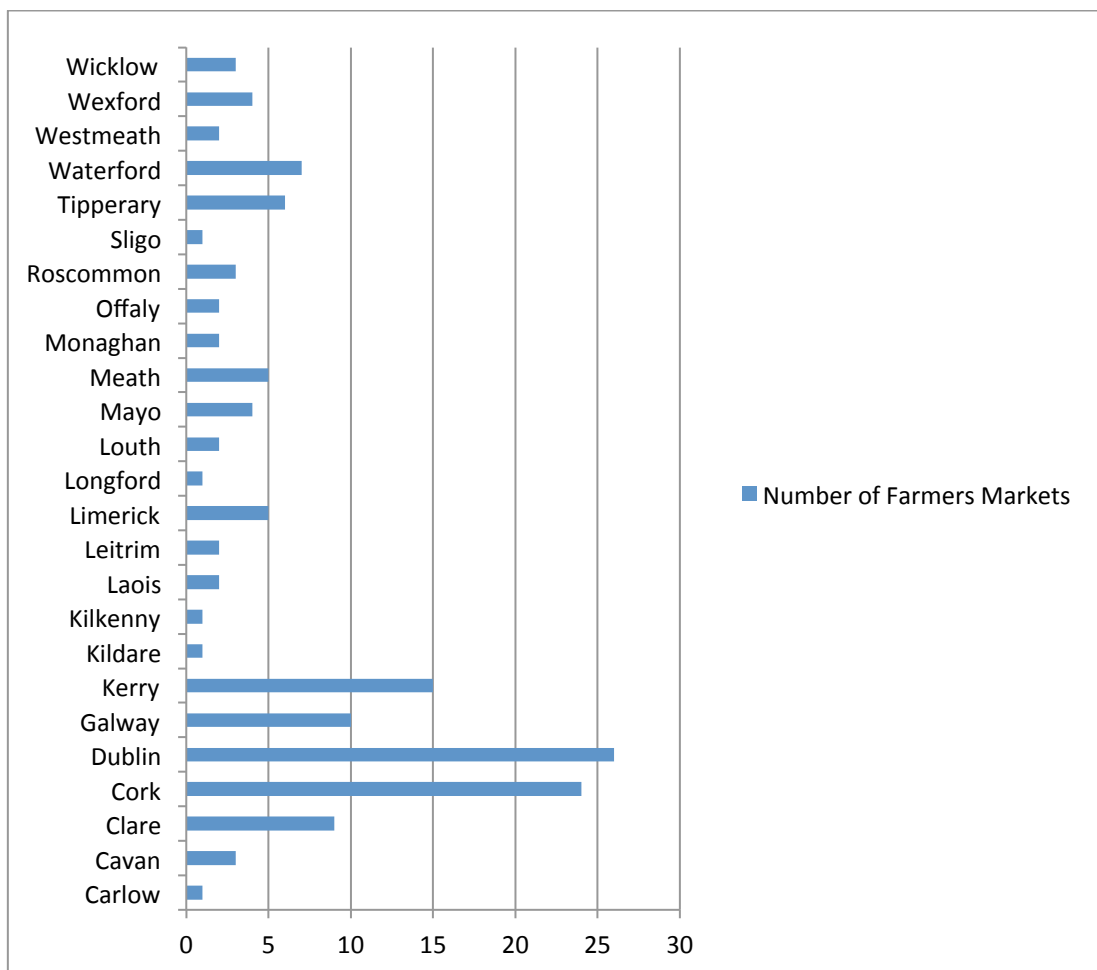
An upsurge in local farmers' markets, food festivals and general consumer interest in locally produced food has encouraged the local farming and food sectors to respond through the diversification of products and new enterprises. Local food tourism has been identified as a potential niche product within the West of Ireland with a tourist trail based on a network of local producers in development. 'Connemara Hill Lamb' has gained wide recognition as a registered Protected Geographical Indication (PGI) (Jones & Woods, 2010). There are 10 farmers' markets in operation in Galway City. Galway has the fourth largest number of farmers' markets in Ireland, after Dublin, Cork and Kerry. The Kinvara Farmers' Market, the Moycullen Market and the Roundstone Country Market all meet the criteria for the Code of Good Practice for Farmers' Markets (Bord Bia, 2014b). There are over 80 farmers' markets in the country, and that number is increasing. Table 8 lists Galway's farmers markets and Figure 23 compares the number of farmers' markets in each county.

Table 8:
Galway's Farmers Markets

Market	Location
Ballinasloe Farmers Market	Ballinasloe
Clifden Farmers Market	Clifden
Galway Market	Galway
Indoor Food & Craft Fair	Galway
Kinvara Farmers Market	KinvaraKinvara
Mountbellew Local Food Market	Mountbellew
Moycullen	Moycullen
Oranmore Producers Market	Oranmore
Roundstone Country Market	Roundstone
The Village Market	Oughterard

(Adapted from Bord Bia, 2014b).

Figure 23:
Number of Farmer's Markets in Ireland



(Adapted from Bord Bia, 2014b)

Mountbellew Agricultural College in collaboration with Teagasc, GMIT, VEC and FÁS has provided agricultural education since 1904. It provides a foreign language facility as well as 200 hectares of farmland, including a 90 cow dairy herd and a 50 unit calf to beef enterprise. There is also a sheep flock of 500 ewes and a 1200 store lamb enterprise. The cereal enterprise consists of 30 hectares of oats and barley. Alternative enterprises of deer, organic farming, forestry and Irish Draft horses have also been established (Teagasc, 2015).

LEADER is an EU funded programme aimed to improve the quality of life in rural areas and to diversify the rural economy. The programme is delivered by a network of 35 Local Development Companies throughout Ireland such as Galway Rural Development Company Ltd. The 2007 – 2013 programme helped farmers to diversify into non-agricultural activities; it supported the creation and development of micro-enterprises; it supported tourism activities; it provided and improved basic services for the rural economy; it enhanced villages; conserved and upgraded rural heritage and provided training to develop skills and build the capacity of local communities to develop local strategies (GRD, 2013). Funds of €250 million for the LEADER element of the Rural Development Programme 2014-2020 have recently been announced by the Minister for Environment, Community and Local Government, which will greatly benefit rural Galway and Mayo. Due to the new Local Government Reform Act 2014, this money will be controlled at a local level and therefore the allocation of resources will be more targeted, cost effective and efficient. Although this is of huge benefit, it is a reduction in funds from €423 million in the 2007-14 programme (Roche, 2014).

3.7 Galway County and City Food Markets

There are 19 food markets in operation in Galway County (see Table 6). Three of these have successfully met the criteria for the Code of Good Practice for Farmers' Markets. They include the Kinvara Farmers Market, the Moycullen Market and the Roundstone Country Market (Bord Bia, 2014).

Table 6:
Galway County Farmers Markets

Farmers Market	Location
Ballinasloe Farmers Market	Croffy's Centre, Main Street, Ballinasloe
Ballinasloe Country Market	Town Hall Theatre
Clifden Farmers Market	The Square, Clifden
Kinvara Farmers Market	The Square Kinvara
Loughrea Market	Barrack Street Loughrea
Mountbellew Local Food Market	Mountbellew
Moycullen Market	An Fuaran (opp. The Forge Pub) Moycullen
Oranmore Producers Market	Behind Church, Oranmore
Roundstone Country Market	Roundstone, Connemara
The Village Market	Supermacs Oughterard
Ballyconneely Country Market	Ballyconneely
Margadh an Spideal	Spideal
Athenry Local Market	Athenry
Portumna Country Market	Portumna
Adrahan Farmers Market	Adrahan
Headford Farmers Market	Keady's Carpark, The Square, Headford
Monivea Village Market	Monivea Green
Tuam Market Place	Tuam Shopping Centre Plaza
Claregalway Family Indoor Market	Claregalway Corporate Park

(Adapted from Bord Bia, 2014; MAST, 2015).

Galway City hosts four markets (see Table 7). The Galway Farmers Market, located in Church Lane in the centre of Galway city has been trading for centuries. It comprises of hundreds of stalls varying in foods from around the world. The Christmas Market opens annually from 14th December until 24th December selling a variety of homemade foodstuffs.

Table 7:
Galway City Farmers Markets

Farmers Market	Location
Galway Farmers Market	Beside St Nicholas Church, Galway
Indoor Food & Craft Fair	St. Mary's Hall, The Claddagh, Galway
Roscam Indoor & Outdoor Market	Castlegar Sports Hall, Roscam
Flea Style Market Factory Galway	36 Upper Abbeygate Street, Galway

(Adapted from Bord Bia, 2014).

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