

A compendium of food chain statistics for the island of Ireland



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Foreword

The promotion of good food safety behaviours throughout the food chain is reliant on a scientifically robust and accurate evidence base. This includes not only information on people's behaviour and preferences regarding the foods they eat but also accurate statistics on food production, trade and economics, and information on food product recalls, foodborne illness, and the impact of external influences such as climate change. A broad range of public and private sector organisations are involved in the generation of this data, which remains fragmented and, in many cases, difficult to access. In Ireland and Northern Ireland, there are several agencies and bodies responsible for collecting, organising and analysing agrifood (agriculture and food production) statistics. In addition, statistical data about Northern Ireland is often mixed with data from Great Britain and so is presented as data for the whole of the United Kingdom.

safefood commissioned this project to generate a compact but detailed collection of food chain statistics for both Ireland and Northern Ireland. This work was undertaken during 2019 and 2020 and investigated the most up-to-date data available at the time. The data have already been published in a variety of other sources. References are provided for these sources, which the reader can consult if they need greater context or a broader perspective of the overall issues.

safefood wishes to thank the Principal Researcher on this project – Dr Karen Clarke, Director at Ipsos in Belfast, Northern Ireland – and her colleagues, particularly Dr Sinéad Furey of the Ulster University Business School, who worked on this project.

Glossary

€	Euro
%	per cent or percentage
£	pounds sterling
AfIB	“Agri-food Inspection Branch”
BMW	biodegradable municipal waste
CCC	Climate Change Committee
CCF	childcare facility
CIR	crude incidence rate
COICOP	Classification of Individual Consumption According to Purpose
CPI	Consumer Price Index
CSO	Ireland Central Statistics Office
DAFM	Department of Agriculture, Food and the Marine in Ireland
DAERA	Department of Agriculture, Environment and Rural Affairs in Northern Ireland
EHS	Environmental Health Service
EU	European Union
EWG	European Waste Catalogue
FDF	Food and Drink Federation
FEFAC	European Feed Manufacturers’ Federation
FSA	Food Standards Agency in Northern Ireland
FSAI	Food Safety Authority of Ireland
FUSIONS	Food Use for Social Innovation by Optimising Food Waste Prevention Strategies
GHG	“greenhouse gas”
GM	genetically modified
GMO	genetically modified organism
HACCP	hazard analysis and critical control point
HPSC	Health Protection Surveillance Centre
HSE	Health Service Executive
MESL	Minimal Essential Standard of Living
NISRA	Northern Ireland Statistics and Research Agency
NMVOG	non-methane volatile organic compound
ONS	Office for National Statistics
RASFF	Rapid Alert System for Food and Feed
SMEs	small and medium-sized enterprises

STEC	Shiga toxin-producing <i>Escherichia coli</i>
US	United States
VTEC	Verocytotoxin-producing <i>Escherichia coli</i>
WHO	World Health Organization

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1 Background and overview of available data on the agrifood sector: the preceding 4 years

The objective of this project was to provide an overview of available data on the agrifood (agriculture and food production) sector across the island of Ireland for 2019 and, where possible, the preceding 4 years. In Ireland, the agrifood sector is defined as “agriculture, forestry and fishing, plus food, beverages and wood processing” while in Northern Ireland the definition is “agriculture, forestry and fishing, plus food and drink processing”. Accurate statistics on food production, trade and economics, and information on food product recalls, foodborne illness, and the impact of external influences such as climate change were gathered.

The ability to find and have access to reliable statistics on the food chain in both Ireland and Northern Ireland is important for organisations that operate in both jurisdictions. This includes **safefood**, the Food Safety Promotion Board, whose key and primary function is the promotion of good food safety behaviours across the whole food chain on the island of Ireland. The food safety regimes on the island of Ireland were harmonised under European Union-based (EU) agrifood policy and legislation. However, since the withdrawal of the United Kingdom (UK) from the EU, possible differences in future policy and legislation will present new challenges for many stakeholders, for whom a comprehensive and accessible resource on up-to-date food chain statistics for the island of Ireland would be of immense benefit.

This study focussed primarily on published statistics from reputable sources in both jurisdictions. All data sources were accessed during 2019. It must be noted that the parameters used to investigate a study population or group may not be the same, or even use the same definitions, in Ireland and Northern Ireland. Although in some cases the data may appear similar, the statistics may not be directly comparable and so it may not be possible to obtain an all-island overview. It may also not be possible to get standalone data for Northern Ireland or to robustly extrapolate the Northern Irish element from the overall UK datasets. Where available, data is presented in five-year trends.

Table 1.1: Key agrifood statistics for the island of Ireland

Key statistics	Detail
Contribution to the economy (Gross Value Added) of the agricultural sector in 2018	£553 million or 1.4 per cent (Northern Ireland) €4,624 million or 1.5 per cent (Ireland)
Number of people employed in the agrifood sector in 2018	40,000 (Northern Ireland) 173,000 (Ireland)
Contribution to the economy (Gross Value Added) 2018	1.4% (Northern Ireland) 1.5% (Ireland)
Value of agrifood and beverage exports in 2017	£4,905 million (Northern Ireland) €13.6 billion (Ireland)
Value of agrifood imports in 2017	£1.5 billion (Northern Ireland) €8.01 billion (Ireland)
Average family expenditure on food per week in 2018	£120 (Northern Ireland) €128 (Ireland)
“Niche markets” in 2018	“Free from” markets increasing steadily across the Island of Ireland 8.0 per cent vegetarian across the island of Ireland 3.5 per cent vegan across the Island of Ireland
“Greenhouse gas” emissions agrifood sector responsible for in 2018	27.0 per cent of emissions (Northern Ireland) 34.0 per cent of emissions (Ireland)
Foodborne illness rates per 100,000 population due to <i>Salmonella</i> species in 2017	6.8 (Northern Ireland) 7.9 (Ireland)
Foodborne illness rates per 100,000 population due to <i>Listeria monocytogenes</i> in 2017	0.10 (Northern Ireland) 0.29 (Ireland)

2 The economics of food production

Introduction

Agriculture and food processing form a significant element of the economies of both Northern Ireland and Ireland. Section 2 of the compendium provides an overview of the key statistics relating to the economic contribution of the wider food chain on the Island of Ireland:

- Contribution to the economy or Gross Value Added (GVA) of the agricultural sector (given in pounds sterling, “£”, for Northern Ireland and in euro, “€”, for Ireland, and as a percentage)
- Number of people employed in the agrifood sector
- Value of exports and imports in the agrifood sector (in pounds sterling, “£”, for Northern Ireland and in euro, “€”, for Ireland)

Gross Value Added

“Gross Value Added” is a measure of the value of goods and services produced by an industry or sector and, therefore, the contribution to the overall economy minus costs such as raw materials. Gross Value Added can be affected by a number of factors, such as weather, exchange rates and global stock markets [1].

The GVA of the agricultural sector in Ireland and in Northern Ireland from 2013 to 2018 is presented in Table 2.1. Due to differences in national accounting principles, the GVA figures provided in Table 2.1 do not include subsidies or direct aid.

Table 2.1: Gross Value Added of the agricultural sector as a percentage of the economy and in millions of pounds sterling (£) in Northern Ireland and in millions of euro (€) in Ireland from 2013 to 2018

Gross Value Added of agricultural sector	2013	2014	2015	2016	2017	2018
Northern Ireland Gross Value Added in millions of pounds sterling (£) [2] [3]	445	450	351	410	644	553
Ireland Gross Value Added in millions of euro (€) [4]	3,815	4,189	2,297	4,093	3,444	4,624

Employment

Data from the Central Statistics Office (CSO) in Ireland and from the Northern Ireland Statistics and Research Agency (NISRA) noted that, in 2018, there were around 213,000 people employed in the agrifood sector on the island of Ireland. (The Department of Agriculture, Environment and Rural Affairs in Northern Ireland [DAERA] notes that agricultural manpower statistics refer to the number of employees and self-employed workers in agriculture, as used by the Department for the Economy. The count of self-employed includes farmers and partners who work full time on their farms; the count of employees includes all other workers except part-time farmers and partners and famers' spouses.)

In 2018, employment within the agrifood sector accounted for 4.6 per cent of all employment in Northern Ireland and 7.7 per cent in Ireland (shown in Table 2.2).

Table 2.2: Employment in the agrifood sector in Northern Ireland (agriculture, forestry and fishing, plus food and drink processing) and in Ireland (agriculture, forestry and fishing, plus food, beverages and wood processing) from 2014 to 2018

Year	Ireland [5]	Ireland	Northern Ireland [6]	Northern Ireland	Island of Ireland
	Number of people employed	Percentage (%) of all employment	Number of people employed	Percentage (%) of all employment	Total number of people employed
2018	173,000	7.7	40,000	4.6	213,000
2017	174,400	7.9	37,000	4.4	211,400
2016	173,400	8.6	40,000	4.7	213,400
2015	165,700	8.4	44,000	5.5	209,700
2014	163,000	8.4	47,000	5.7	210,000
Average	169,900	8.2	41,600	5.0	211,500

The following paragraphs provide an overview of the key datasets on agrifood exports and imports in Ireland.

Northern Ireland agrifood exports and imports

In 2017, the total value of agrifood (including beverages) exports from Northern Ireland was £4,905 million, rising from £4,607 million in 2013 (Table 2.3) [7] [8]. The rest of the UK was the main destination for sales from the Northern Irish food and drinks processing sector.

Table 2.3: Value of food and drinks exports from Northern Ireland by category in millions of pounds sterling (£) from 2013 to 2017 [8]

Food or drink product category	2013	2013	2014	2014	2015	2015	2016	2016	2017	2017
	Value of food and drinks exports from Northern Ireland	Value of food and drinks exports from Northern Ireland outside of the United Kingdom	Value of food and drinks exports from Northern Ireland	Value of food and drinks exports from Northern Ireland outside of the United Kingdom	Value of food and drinks exports from Northern Ireland	Value of food and drinks exports from Northern Ireland outside of the United Kingdom	Value of food and drinks exports from Northern Ireland	Value of food and drinks exports from Northern Ireland outside of the United Kingdom	Value of food and drinks exports from Northern Ireland	Value of food and drinks exports from Northern Ireland outside of the United Kingdom
Animal by-products	No data	22.0	No data	No data	No data	No data	No data	No data	No data	No data
Bakeries	131.5	74.0	129.3	75.2	129.0	76.1	152.4	92.7	165.0	98.8
Beef meat and sheep meat	1,016.8	241.1	1,021.0	241.6	1,053.4	234.8	1,035.3	220.5	1,150.8	223.3
Drinks	237.3	194.6	227.3	179.0	211.6	168.2	216.9	182.2	228.2	195.3

Eggs	91.0	13.4	94.0	12.7	97.3	12.9	105.8	13.0	118.9	12.9
Fish	66.2	32.0	64.1	30.0	64.4	30.5	66.9	31.1	80.4	34.8
Fruit and vegetables	191.0	57.2	199.8	60.8	205.3	51.4	217.9	55.7	223.3	63.6
Milk and milk products	703.0	480.7	707.6	462.2	643.5	380.5	632.5	309.4	776.3	No data
Pig meat	191.9	71.6	189.1	83.6	180.8	79.2	192.8	71.2	201.4	90.3
Poultry meat	No data	131.4	No data	No data	No data	No data	No data	No data	No data	No data
Totals	3,289.2	1,318.1	3,322.1	1,298.8	3,277.3	1,178.2	3,287.1	1,099.0	3,641.1	1,264.0

Note: Not all food and drink product categories are shown so the totals are greater than the sum of the individual product category values for the different export years.

“No data” in Table 2.3 indicates that data has been suppressed due to data disclosure issues in these subsectors, in line with the UK’s Code of Practice for Statistics.

The latest available data (from 2018) relating to food and drink processing sector exports from Northern Ireland shows that Northern Irish businesses conducted most international trade (outside of the UK) with Ireland, accounting for around 15.0 per cent of exports and 33.0 per cent of imports [9].

Food and drinks and live animals represented around 33.0 per cent of the total Northern Ireland exports going to Ireland, of which the top subcategory was milk and cream products. The data also shows that the rest of the UK remains Northern Ireland’s biggest single agrifood market (Table 2.4).

Table 2.4: Total value of food, drinks and live animal exports from Northern Ireland in millions of pounds sterling (£) from 2014 to 2018 [9]

Year	Total value of food, drinks and live animal exports from Northern Ireland to the Great Britain	Total value of food, drinks and live animal exports from Northern Ireland outside of the United Kingdom
2018	3,987	1,369
2017	3,639	1,260
2016	3,287	1,099
2015	3,277	1,178
2014	3,322	1,298

Note: The export values given in Table 2.4 do not include an estimate of exports from food and drinks processing businesses with turnovers less than £250,000 [10].

Table 2.5 shows the main EU trading partners for Northern Irish imports and exports in 2018 and 2019. In 2019, the total value of food and drinks exported from Northern Ireland to Ireland was roughly the same as the value imported into Northern Ireland from Ireland (£1,510 million) [11].

His Majesty’s Revenue and Customs Regional Trade Statistics for the UK show that food and live animals account for around 20.0 per cent of all goods imported into Northern Ireland.

Table 2.5: Top European Union trading partners for Northern Irish food and live animal exports and imports valued in millions of pounds sterling (£) in 2018 and 2019 [12]

European Union Member State	2018	2018	2019	2019
	Value of food and drinks exports from Northern Ireland	Value of food and drinks imports to Northern Ireland	Value of food and drinks exports from Northern Ireland	Value of food and drinks imports to Northern Ireland
Ireland	1,000.0	898.0	1,500.0	1,500.0
Netherlands	91.5	194.2	77.8	169.9
France	27.0	63.0	72.1	30.2
Belgium	60.9	37.1	64.4	33.2
Germany	35.9	83.1	23.9	89.9

Ireland agrifood exports and imports

Since 2015, the value of food and drinks exported from Ireland has consistently exceeded food and drinks imports [13]. In 2019, the value of food exported was €13,436 million, compared with €8,787 million in imports (Table 2.6).

Table 2.6: Value of food and beverage exports from, and imports to, Ireland in millions of euro (€) from 2015 to 2019 [13]

Year	Value of food and beverage exports from Ireland	Value of food and beverage imports to Ireland
2019	13,436	8,787
2018	12,621	8,666
2017	12,732	8,005
2016	11,394	7,522
2015	11,095	7,444

The agrifood sector in Ireland includes primary production (agriculture, fishing and forestry), food and beverages and the wood processing sector. It includes traditional food products such as beef, dairy and beverages, along with nonedible items such as animal foodstuffs, forestry, and animal hides and skins.

Table 2.7 shows the total value of food and beverages and live animals exported from and imported into Ireland from 2015 to 2019 [14]. Meat and meat preparations accounted for around a third of food exports while dairy products and birds' eggs accounted for between a fifth and a quarter, depending on the year. Cereals and fruits and vegetables were the most imported foods into Ireland in this time period.

In 2019, the value of food and beverages exported from Ireland was €13,436 million and the value imported into Ireland was €8,787 million [14].

Table 2.7: Value of food and beverages and live animal exports from, and imports to, Ireland by category in millions of euro (€) from 2015 to 2019 [14]

Food or beverage product category	Value of exports from Ireland	Value of exports from Ireland	Value of exports from Ireland	Value of exports from Ireland	Value of exports from Ireland	Value of imports to Ireland	Value of imports to Ireland	Value of imports to Ireland	Value of imports to Ireland	Value of imports to Ireland
	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
Live animals	436	340	448	440	458	316	284	303	262	319
Meat and meat preparations	3,482	3,596	3,846	3,939	3,870	958	956	983	1,028	1,017
Dairy products and birds' eggs	1,789	1,760	2,393	2,609	3,036	695	611	785	840	871
Fish, crustaceans, molluscs and preparations of these	564	555	617	576	575	259	263	291	290	309
Cereals and cereal preparations	399	381	419	440	536	1,014	1,049	1,103	1,277	1,304
Fruit and vegetables	287	278	299	321	315	1,156	1,211	1,252	1,334	1,362
Sugars, sugar preparations and honey	163	212	157	147	152	374	369	377	360	382
Coffee, tea, cocoa, spices and	370	374	374	385	413	543	569	595	614	659

Food or beverage product category	Value of exports from Ireland	Value of exports from Ireland	Value of exports from Ireland	Value of exports from Ireland	Value of exports from Ireland	Value of imports to Ireland	Value of imports to Ireland	Value of imports to Ireland	Value of imports to Ireland	Value of imports to Ireland
manufactures thereof										
Animal feedstuffs (excluding unmilled cereals)	295	283	320	346	366	779	741	780	1,064	898
Miscellaneous edible products and preparations	2,068	2,317	2,502	1,975	2,002	564	636	714	736	757
Total food	9,853	10,096	11,375	11,178	11,724	6,659	6,689	7,183	7,805	7,877
Beverages	1,242	1,298	1,358	1,443	1,712	785	833	822	861	910
Total food and beverages	11,095	11,394	12,732	12,621	13,436	7,444	7,522	8,005	8,666	8,787

The UK is the largest market for Irish exports. Table 2.8 shows the value of the top 15 categories of agrifood exports and imports [15].

Table 2.8: Value of Irish agrifood exports to, and imports from, Great Britain, Northern Ireland the United Kingdom by category in millions of euro (€) in 2017 [15]

Agrifood product category	Value of agrifood exports from Ireland to Great Britain	Value of agrifood exports from Ireland to Northern Ireland	Value of agrifood exports from Ireland to the United Kingdom	Value of agrifood imports from Great Britain to Ireland	Value of agrifood imports from Northern Ireland to Ireland	Value of agrifood imports from the United Kingdom to Ireland
Beef	1,049	119	1,168	91	12	104
Dairy	904	92	996	325	243	569
Pig meat	402	44	446	137	7	144
Cereals	293	80	373	593	65	659
Beverages	215	78	293	277	68	345
Live animals	247	82	329	235	8	244
Fruit and vegetables	203	47	250	357	83	441
Poultry	195	25	220	145	21	166
Animal foodstuffs	161,	73	234	155	113	268
Miscellaneous edible products and preparations	131	14	145	298	10	308
Forestry	110	42	152	41	15	56
Fish	51	9	60	167	18	184
Sheep meat	56	392	56	23	107	23
Other meat and meat produce	41	3	45	16	0.7	17
Other agrifood	356	44	400	561	51	612
Totals	4,416	753	5,169	3,421	716	4,137

Agrifood sector (including beverages) exports are an important element of the economies of both Northern Ireland and Ireland, accounting for at least £4,905 million and €12,732 million in exports in 2017, respectively.

The agrifood sector accounted for 11.0 per cent of all imports to Ireland in 2018, with €9.7 billion of agrifood products imported [16]. This was an increase on the €8.7 billion and €8.2 billion imports in 2017 and 2016, respectively. Table 2.9 sets out the proportionate value of foodstuffs imported by category.

Table 2.9: Percentage value of selected agrifood imports to Ireland by category from 2016 to 2018 [16]

Selected agrifood product category	2016	2017	2018
	Percentage (%) of agrifood imports	Percentage (%) of agrifood imports	Percentage (%) of agrifood imports
Cereal and cereal preparations	13	13	13
Animal foodstuffs	9	9	11
Dairy produce	8	10	10
Beverages	10	9	9
Fruit and vegetables	15	14	9
Fruit-based and vegetable-based products	No data	No data	5
Miscellaneous edible products and preparations	7	7	6
Coffee, tea, cocoa and spices	7	7	6
Poultry	5	5	5
Other	N/A	38	26
Total value of agrifood imports	€8.2 Billion	€8.7 Billion	€9.7 Billion

Note: “No data” in Table 2.9 means that data was requested from the CSO for Ireland but was not obtained.

In 2018, agrifood goods were imported into Ireland from over 180 countries worldwide. The top 5 countries of origin were the UK, the Netherlands, Germany, France and the United States (US), accounting for 73.0 per cent of Ireland’s total imports for that year. Table 2.10 sets out the main sources of food imports to Ireland.

Table 2.10: Country of origin of agrifood imports to Ireland as a percentage of total agrifood imports in 2017 and in 2018 [17]

Country of origin of agrifood imports to Ireland	2017	2018
	Percentage (%) of total agrifood imports to Ireland	Percentage (%) of total agrifood imports to Ireland
United Kingdom	47	46
Netherlands	10	9
Germany	7	7
France	5	5
United States	3	4
Spain	3	3
Belgium	3	2
Argentina	2	2
Canada	No data	2
Italy	2	2
Poland	2	No data
Other	16	18

Overview of agricultural output and commodity prices

“Agricultural output” is the value of the goods produced and sold from agriculture. This subsection of the compendium provides an overview of the key datasets on agricultural output and commodity prices on the island of Ireland.

Northern Ireland agricultural output and commodity price data

Table 2.11 shows agricultural indices on various producer prices in Northern Ireland, including cattle, sheep, pigs, grains, milk and potatoes. The indices relate to prices from which marketing expenses have not been deducted.

The “total products index” is calculated by taking into account the significance of each item in the base period (that is, Year 2015). This is shown in the column of weights. Since only the main items of output are included, the total of their weights does not add up to 1,000. Also, since the price index does not cover items such as production grants, compensation payments and gross fixed capital formation, it should not be regarded as a “deflator” to be used in estimating the volume of output.

The “inputs index” does not cover all inputs. It comprises feedstuffs, seeds, fertilisers and lime, and marketing expenses.

Table 2.11: Indices of producer prices of agricultural output in Northern Ireland from 2010 to 2019 [18]

Agricultural category	Weights	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019 (Provisional figures)
Finished steers and heifers*	221	78	90	97	109	101	100	98	107	107	100
Culled cows and bulls*	32	91	107	114	120	102	100	101	116	118	105
Store cattle exported	3	76	84	89	96	97	100	94	101	101	98
Finished sheep and lambs	48	109	121	107	114	112	100	114	117	125	113
Finished clean pigs	71	107	113	118	131	123	100	100	128	120	123
Milk	360	120	131	124	150	140	100	97	137	137	129
Eggs for consumption	26	87	91	107	98	96	100	100	97	92	87
Broilers	80	95	107	107	115	108	100	101	105	108	109
Ware maincrop potatoes (potatoes sold fresh, for consumption)	19	97	94	119	152	97	100	119	114	132	136
Seed potatoes	3	114	119	103	143	109	100	112	113	109	128
Barley	23	104	137	150	137	112	100	102	118	142	125
Wheat	5	112	141	149	144	115	100	101	118	134	128
Mushrooms	33	81	93	95	97	99	100	98	102	105	107
Apples	6	51	49	68	99	96	100	95	97	75	73
Total products index	930	100	110	112	124	116	100	99	118	119	113
Inputs index	1000	87	99	105	110	106	100	98	98	104	106

Notes: In Table 2.11, animals slaughtered under foot-and-mouth disease control measures are not included.

* Includes cattle slaughtered under the “Over Thirty Months Scheme”.

Ireland agricultural output and commodity prices

“Net Operating Surplus” is calculated as Gross Value Added at basic prices less (a) Compensation of Employees, (b) Consumption of Fixed Capital and (c) other subsidies less taxes on production. The CSO estimated that the operating surplus in agriculture increased by over €800 million between 2016 and 2017 (around 31.0 per cent). Output from agriculture in Ireland in 2017 is shown in Table 2.12.

Table 2.12: Agricultural output in Ireland by category in 2017 [19]

Agriculture category	Percentage (%) of output from agriculture in Ireland in 2017	Value of output from agriculture in Ireland in millions of euro (€) in 2017
Milk	45	809
Cattle	3	72
Pigs	11	50
Sheep	3	7
Cereals	3	6
Goods output at producer prices	14	992

Eurostat (the statistical office of the EU) have developed an interactive food price monitoring tool that tracks price trends along the food supply chain from farm to consumer. The tool provides data for prices relating to each component of the food supply chain – imports, agricultural sector, food processing sector and retail sector.

The “Agricultural Output Price Index” is a system that records and measures changes and rates of change in values of “producer prices” or “farm-gate prices” (which exclude Value Added Tax). It is based on the sales of agricultural products. In this latest series of output statistics, Year 2015 is used as the “base” for the indices, with a value of 100.0 against which the producer prices for other years can be compared or related.

Table 2.13 provides an overview of producer prices of agricultural products in Ireland (the Agricultural Output Price Indices) from 2014 to 2017. The Agricultural Output Price Index increased by 11.9 per cent in 2017, compared with 2016.

Table 2.13: Agricultural Output Price Indices for Ireland from 2014 to 2017: (Base year 2015=100)**[20]**

Agricultural category	2014	2015	2016	2017
Cattle	90.4	100.0	93.0	94.8
Sheep	98.8	100.0	99.9	99.6
Pigs	109.4	100.0	102.6	110.4
Poultry	101.2	100.0	99.5	99.2
Milk	128.6	100.0	91.0	121.3
Cereals	105.8	100.0	101.3	101.9
Potatoes	87.5	100.0	128.5	117.2
Vegetables	99.9	100.0	100.3	100.2
Total outputs	106.8	100.0	95.1	106.5

Detailed information on Irish food market reports can be accessed through the Irish Farmers' Association website [21]. Commodity reports and the latest prices for different commodities, such as cattle, also can be accessed through the Irish Farmers Association [22] [23].

Table 2.14 provides an overview of changes in agricultural commodity prices for food for Ireland, the UK and the EU between 2015 and 2019. (Northern Ireland-specific data is not available within this dataset.) In this latest series of commodity price statistics, Year 2015 is used as the “base” for the indices, with a value of 100.0 against which the commodity prices for other years can be compared or related. Month-on-month data can be accessed in Eurostat’s food price monitoring tool [24], which will provide a more detailed view of price changes.

Table 2.14: Agricultural Commodity Prices Indices for Ireland, the United Kingdom and the European Union (28 countries, 2013 to 2020) from 2015 to 2019 [24]

Region	2015	2016	2017	2018	2019
Ireland	97.4	95.4	108.6	104.6	100.0
United Kingdom	98.1	102.7	111.8	117.5	110.5
European Union (28 countries, 2013 to 2020)	99.4	99.3	106.4	109.7	No data

3 Animal feed

Introduction

“Agricultural input” is the value of all goods and services (excluding fixed assets, or “capital goods”) used to in the production of goods from agriculture. Animal feedstuffs, including feed materials and compound feeds, are the main input into livestock production [25].

“Compound feed” is fodder that is blended from various raw materials and additives. These blends are formulated according to the specific requirements of the target animal. They are manufactured by feed compounders as “meal type”, “pellets” or “crumbles” [26].

Table 3.1 shows the level of compound feed production in the UK and Ireland between 2013 and 2017 [27].

Table 3.1 Compound feed production in the United Kingdom and Ireland in thousands of tonnes from 2013 to 2017 [27]

Year	United Kingdom compound feed production in thousands of tonnes	Ireland compound feed production in thousands of tonnes
2017	16,267	4,366
2016	15,635	4,005
2015	15,560	3,988
2014	15,645	3,622
2013	15,633	4,377

Northern Ireland animal feed

Northern Ireland animal feed statistics

Northern Ireland animal feed statistics are based on surveys and provide information on the quantities, or “deliveries”, of feed used in Northern Ireland on a monthly, quarterly and annual basis. In February 2020 there were 502 registered and 135 approved feed business operators’ premises establishments in Northern Ireland [28]. The “Agri-food Inspection Branch” (AfIB) of DAERA is responsible for approving establishments that use animal

medicines or other specified feed additives. The AfIB also implements a programme of sampling and testing of feeds and feed ingredients.

National statistics on Northern Ireland animal feed produced by DAERA are released according to arrangements approved by the UK Statistics Authority. The data presented here represent the latest monthly or annual data available when the statistics were being compiled.

Northern Ireland animal feed deliveries

As shown in Table 3.2, total deliveries of compound and other processed animal feedstuffs have increased since 2015. Despite some variation in deliveries of cattle or calf animal feed, there have been overall increases in the cattle or calf, poultry and pig feed categories.

According to the Northern Ireland Grain Trade Association, the animal feed industry underpins the growth achieved by various livestock sectors [29]

Table 3.2: Deliveries of compound and other processed animal feedstuffs by Northern Ireland manufacturers in thousands of tonnes, overall and by livestock species, from 2009 to 2019 [30]

Livestock species	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
<i>Overall</i>	2,013.1	2,071.1	2,085.6	2,193.8	2,316.3	2,313.3	2,253.7	2,236.2	2,446.2	2,603.9	2,497.9
Cattle or calf	1,058.2	1,087.2	1,078.9	1,190.7	1,283.8	1,211.3	1,150.0	1,133.4	1,274.3	1,348.6	1,262.5
Pig	125.6	152.6	186.7	165.3	160.9	180.0	197.1	208.3	225.5	238.2	240.1
Poultry	665.4	680.6	691.8	692.7	709.8	778.9	770.3	754.4	798.1	865.4	851.1
Sheep	70.2	73.5	66.4	74.9	82.8	67.2	62.4	65.7	67.7	72.7	54.6
Other	93.7	77.2	61.8	70.2	79.1	75.9	74.0	74.5	80.7	78.9	89.7

Table 3.3: Monthly deliveries of compound and other processed animal feedstuffs made by Northern Ireland manufacturers to the nearest thousand tonnes in 2017 and 2018 [29]

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2017	236	224	256	218	212	191	186	210	203	225	211	234
2018	255	218	218	200	208	172	195	180	182	236	210	216

Table 3.4: February deliveries of compound and other processed animal feedstuffs made by Northern Ireland manufacturers by livestock species in thousands of tonnes from 2016 to 2020 [31]

Animal feedstuff	February 2016	February 2017	February 2018	February 2019	February 2020
Calf milk substitutes	0.0	0.0	0.0	0.0	0.0
Other calf compounds	6.3	6.6	7.0	7.1	7.1
Beef cattle compounds	12.7	15.7	18.1	15.6	13.8
Dairy cow compounds	40.4	43.9	46.7	45.2	45.1
All other cattle compounds	0.5	0.5	0.6	0.7	0.6
Beef – coarse mixes or blends	20.9	22.3	26.7	24.5	23.5
Dairy – coarse mixes or blends	20.5	20.7	23.3	22.1	20.7
Protein concentrates	0.1	0.1	0.1	0.0	0.1
<i>Total cattle and calf feedstuffs</i>	<i>101.4</i>	<i>109.8</i>	<i>122.6</i>	<i>115.3</i>	<i>110.8</i>
Pig starter and creep feed	1.2	1.8	2.3	2.2	2.9
Pig link or early grower feed	2.1	2.7	2.8	2.9	3.1
Pig growing feed	3.2	3.3	3.3	3.3	3.3
Pig finishing feed	7.0	7.3	7.2	7.3	9.2
Pig breeding feed	2.7	2.7	2.8	2.7	2.5
Protein concentrates	0.0	0.0	0.0	0.0	0.0
<i>Total pig feedstuffs</i>	<i>16.2</i>	<i>17.8</i>	<i>18.2</i>	<i>18.4</i>	<i>21.1</i>
Chick rearing feed	2.0	2.0	2.2	4.5	1.8

Animal feedstuff	February 2016	February 2017	February 2018	February 2019	February 2020
Layer and breeder feed	19.0	21.0	22.3	2.3	24.1
Broiler feed	32.3	34.5	36.6	1.9	36.1
Turkey and other poultry feed	3.4	3.3	2.9	0.0	2.6
<i>Total poultry feedstuffs</i>	<i>56.7</i>	<i>60.7</i>	<i>63.8</i>	<i>67.7</i>	<i>64.6</i>
Breeding sheep compounds	5.1	3.9	5.8	4.5	3.9
Growing or finishing sheep compounds	2.4	3.1	3.0	2.3	3.3
Sheep – coarse mixes or blends	2.1	1.9	2.6	1.9	2.1
Protein concentrates	0.0	0.0	0.0	0.0	0.0
<i>Total sheep feedstuffs</i>	<i>9.5</i>	<i>8.9</i>	<i>11.4</i>	<i>8.7</i>	<i>9.4</i>
Flaked maize and maize meal	4.9	4.9	6.0	4.8	4.2
Flaked barley and barley meal	0.2	0.3	0.2	0.2	0.2
Any other feedstuff	1.9	2.0	1.9	3.6	3.6
<i>Total other feedstuffs</i>	<i>7.0</i>	<i>7.1</i>	<i>8.1</i>	<i>8.7</i>	<i>8.1</i>
Total all feedstuffs	190.7	204.3	224.2	218.8	213.9

Table 3.5 shows the total deliveries of animal feed by volume from Northern Irish manufacturers compared with deliveries outside of Northern Ireland.

Table 3.5: Total deliveries, and deliveries outside Northern Ireland, of compound and other processed animal feedstuffs made by Northern Ireland manufacturers in thousands of tonnes from 2009 to 2019 [30]

Year	Total animal feedstuff deliveries by Northern Ireland manufacturers in thousands of tonnes	Animal feedstuff deliveries outside Northern Ireland in thousands of tonnes
2019	2,497.9	152.0
2018	2,603.9	181.7
2017	2,446.2	170.5

Year	Total animal feedstuff deliveries by Northern Ireland manufacturers in thousands of tonnes	Animal feedstuff deliveries outside Northern Ireland in thousands of tonnes
2016	2,238.8	164.4
2015	2,253.7	142.3
2014	2,313.3	142.6
2013	2,316.3	182.4
2012	2,193.8	145.3
2011	2,085.6	153.8
2010	2,071.1	136.6
2009	2,013.1	123.3

Raw materials used in animal feed manufacture in Northern Ireland

The primary raw materials used in the manufacture of compound and other processed animal feedstuffs in Northern Ireland are wheat, whole and flaked maize and soya cake and meal. Between 2015 and 2019, the volume of such raw materials used in animal feed manufacture has increased (Table 3.6).

Table 3.6: Deliveries of raw materials used in the manufacture of compound and other processed animal feedstuffs in Northern Ireland in thousands of tonnes from 2015 to 2019 [30]

Raw material	2015	2016	2017	2018	2019
Wheat	514.9	514.6	557.1	600.1	547.5
Barley	130.3	131.6	144.5	179.4	148.0
Whole and flaked maize	410.5	410.8	461.4	489.9	579.6
Maize gluten feed	110.9	112.0	130.5	129.8	127.7
By-products of malting, brewing and distilling	121.5	122.3	155.3	173.1	149.6
Other grains and cereal by-products	124.1	124.7	119.7	108.1	90.8
Rape seed cake and meal	109.4	110.1	100.9	101.9	94.4
Soya cake and meal	342.4	346.6	368.9	384.9	369.3
Whole oilseeds and other oilseed cakes and meals	63.0	63.6	68.0	75.5	72.1

Raw material	2015	2016	2017	2018	2019
Fish meal	0.0	0.0	0.0	0.0	0.0
Meat and bone meal	0.0	0.0	0.0	0.0	0.0
Milk products or by-products and other animal by-products (excluding fats)	4.6	4.6	5.9	6.7	6.3
Roots and tubers	0.2	0.2	0.1	0.4	0.0
Citrus and other fruit pulp	10.3	10.4	11.0	9.9	7.3
Molasses and sugar	62.2	63.5	65.5	71.0	59.5
Oils and fats	19.9	19.8	21.5	22.7	24.1
Dried forages and dried sugar beet pulp	35.2	36.4	41.3	51.1	49.1
Minerals, vitamins and other dietary supplements	68.1	67.7	78.9	87.6	79.0
Other raw materials	88.2	89.2	121.1	127.6	129.2
Total raw materials	2,215.9	2,228.0	2,451.6	2,619.8	2,533.6

Table 3.7 shows deliveries of raw materials made by animal feed manufacturers to Northern Irish farmers and distributing merchants. The highest volume of raw materials sold directly to farmers and distributing merchants within Northern Ireland are soya cake and meal, whole and flaked maize and barley.

Table 3.7: Deliveries of raw materials sold directly by animal feed manufacturers to Northern Ireland farmers and distributing merchants in thousands of tonnes from 2015 to 2019 [30]

Raw material	2015	2016	2017	2018	2019
Wheat	15.4	14.7	15.4	14.2	15.7
Barley	26.6	26.5	23.8	20.1	30.6
Whole and flaked maize	54.6	50.1	48.1	44.8	46.4
Maize gluten feed	15.7	14.2	17.9	14.2	16.1
By-products of malting, brewing and distilling	10.9	12.0	16.7	17.6	20.7
Other grains and cereal by-products	2.7	2.0	2.3	1.0	0.9
Rape seed cake and meal	6.2	3.2	4.2	6.1	4.8
Soya cake and meal	71.7	73.8	67.5	76.8	69.1

Raw material	2015	2016	2017	2018	2019
Whole oilseeds and other oilseed cakes and meals	1.9	2.3	3.3	3.5	3.4
Fish meal	0.0	0.0	0.0	0.0	0.0
Milk products or by-products and other animal by-products (excluding fats)	0.2	0.1	0.2	0.2	0.2
Roots and tubers	0.0	0.0	0.0	0.0	0.0
Citrus and other fruit pulp	0.3	0.2	0.5	0.1	0.2
Molasses and sugar	5.5	5.4	5.8	5.6	6.7
Oils and fats	1.3	1.7	2.0	1.6	1.8
Dried forages and dried sugar beet pulp	5.3	3.6	3.7	5.1	6.6
Minerals, vitamins and other dietary supplements	0.9	1.2	1.6	1.4	1.7
Other raw materials	3.9	2.8	2.6	1.7	2.4
Total raw materials	223.1	213.8	215.6	213.7	227.4

Ireland animal feed

Ireland industrial compound animal feed deliveries

“Compound feed” is a mixture of various concentrated raw materials (such as brans, grains, proteins, oils, vitamins and minerals) in suitably balanced proportions for the species of animal and the purpose or type of the feed.

According to the European Feed Manufacturers’ Federation’s (FEFAC) report, “Feed & Food 2018”, industrial compound feed production in Ireland has increased from 4,366 thousand tonnes in 2017 to 5,279 thousand tonnes in 2018 (Table 3.8) [25]. Data from the report are based on information received from the Member Associations, FEFAC contact points in the European Free Trade Association and candidate countries as well as FEFAC’s own calculations.

Table 3.8: Industrial compound animal feed deliveries in Ireland in thousands of tonnes in 2017 and 2018 [25]

Compound feed type	2017	2018
Fattening	1,278	1,576
Dairy cows	1,326	1,843
Calves (excluding milk replacers)	233	263
Other	82	125
<i>Total compound feeds for cattle or calves</i>	<i>2,919</i>	<i>3,807</i>
Piglets	153	138
Pigs for fattening	376	421
Breeding pigs	107	100
Other	56	53
<i>Total compound feeds for pigs</i>	<i>692</i>	<i>712</i>
<i>Total compound feeds for poultry</i>	<i>640</i>	<i>632</i>
<i>Other compound feeds</i>	<i>115</i>	<i>128</i>
Total	4,366	5,279

Ireland animal feed exports and imports

The volume of animal feed exports from Ireland has increased from 402.8 thousand tonnes in 2008 to 652.3 thousand tonnes in 2018 (Table 3.9). A significantly higher volume of animal feed was imported into Ireland. Animal feed imports into Ireland have also grown over the last 10 years, from 1,659.9 thousand tonnes in 2008 to 4,067.9 thousand tonnes in 2018. According to the farming news portal “Agriland”, imports of maize – the majority of which is used for animal feed – increased in 2019 [32].

In 2018, the Minister for Agriculture, Food and the Marine stated that,

“In Ireland, up to 80.0 per cent of the animal feed requirement for ruminants is supplied from grass, hay and silage, complemented, where appropriate, by compound feeds. In the case of pigs and poultry, virtually all nutrition is derived from compound feeds. In 2017, Ireland imported approximately 3.47 million tonnes of animal feed

materials. In addition, approximately 2.1 million tonnes of home-grown cereals is used in the production of animal feed, bringing the total usage of feed materials to about 5.6 million tonnes annually. With our grass-based livestock production system, with limited tillage area, Ireland is especially dependent on feed imports relative to other EU Member States.” [33]

Table 3.9: Animal feedstuffs exports from and imports to Ireland in thousands of tonnes from 2008 to 2018 [34]

Year	Animal feedstuffs exports from Ireland in thousands of tonnes	Animal feedstuffs imports to Ireland in thousands of tonnes
2018	652.3	4,067.9
2017	607.1	3,056.7
2016	569.3	2,811.0
2015	535.5	2,633.8
2014	438.8	2,733.2
2013	512.6	3,063.2
2012	475.0	2,773.0
2011	525.0	2,290.5
2010	475.1	2,547.4
2009	388.6	2,190.3
2008	402.8	1,659.9

As of April 2020, animal feed had been exported from Ireland to at least 44 countries and imported from at least 33 countries, summarised in Table 3.10. In 2018, the Minister for Agriculture, Food and the Marine stated that:

“Due to our high proportion of livestock production compared to tillage area, Ireland is especially dependent on feed imports relative to other EU Member States. Approximately two-thirds of the feed materials marketed here are imported, compared to 37.0 per cent in the UK, 27.0 per cent in France and 26.0 per cent in Germany. The pig, poultry and dairy sectors are particularly dependent on imports of

GM (genetically modified) soybean and GM maize by-products as they are essential ingredients in the formulation of these feed rations.” [33]

Table 3.10: Value of animal feedstuffs exports from and imports to Ireland by country in thousands of euro (€) in the year to April 2020 [35]

Country of destination or origin	Export value of feedstuffs in year to April 2020 in thousands of euro (€)	Import value of feedstuffs in year to April 2020 in thousands of euro (€)	Country of destination or origin	Export value of feedstuffs in year to April 2020 in thousands of euro (€)	Import value of feedstuffs in year to April 2020 in thousands of euro (€)
Austria	307	279	Malaysia	314	3,221
Australia	473	108	Malta	119	No data
Belgium	217	8,884	Netherlands	2,724	19,458
Brazil	No data	44	Northern Ireland	34,757	38,209
Bulgaria	242	No data	Norway	324	1
Canada	354	14,612	Other countries	6,338	93,582
China	506	2,714	Poland	292	3,519
Croatia	17	No data	Portugal	40	530
Cyprus	12	No data	Romania	2	36
Czech Republic	208	67	Russia	286	9,837
Denmark	1,752	525	Saudi Arabia	471	No data
Estonia	36	No data	Singapore	364	No data
Finland	116	2	Slovakia	51	No data
France	2,214	18,700	Slovenia	15	No data
Germany	6,121	12,189	South Africa	478	No data
Great Britain	55,453	51,521	South Korea	599	No data
Greece	226	34	Spain	1,375	2,047
Hungary	235	242	Sweden	628	5,029
India	2,150	238	Switzerland	464	375
Italy	6,274	300	Taiwan	182	No data
Japan	1,184	55	Thailand	129	101
Latvia	44	6,762	Turkey	859	313
Lithuania	58	2,555	United States	3,578	46,292

Farmed land utilisation in Ireland

The majority of farmed land area in Ireland is dedicated to crops and pasture (Table 3.11). Cereals, including oats and barley, accounted for around 12.0 per cent of farmed land use in 2019.

Table 3.11: Area of farmed land under crops and pasture in June in Ireland in thousands of hectares from 2017 to 2019 [36]

Crop or pasture	June 2017	June 2018	June 2019
Winter wheat	60.3	54.4	59.7
Spring wheat	6.8	3.6	3.8
<i>Total wheat</i>	<i>67.0</i>	<i>58.0</i>	<i>63.5</i>
Winter oats	14.4	10.2	16.6
Spring oats	10.0	7.6	7.2
<i>Total oats</i>	<i>24.4</i>	<i>17.8</i>	<i>23.8</i>
Winter barley	65.0	57.9	82.8
Spring barley	115.2	127.4	96.5
<i>Total barley</i>	<i>180.2</i>	<i>185.2</i>	<i>179.4</i>
<i>Total other cereals</i>	<i>0.8</i>	<i>0.6</i>	<i>1.0</i>
Beans and peas	13.7	8.5	8.1
Oilseed rape	10.1	10.6	10.6
Arable silage	2.9	3.3	3.3
Maize silage	11.9	17.8	17.8
Fodder rape and kale	1.6	1.5	1.5
Potatoes	9.2	8.2	8.2
Turnips	0.8	0.9	0.9
Beet (sugar beet and fodder beet)	10.0	11.3	11.3
Vegetables for sale	3.6	3.6	3.6
Fruit	0.8	0.8	0.8
Nurseries, horticulture and such	0.5	0.5	0.5
Other crops*	28.1	28.4	28.4
<i>Total fruit and horticulture</i>	<i>93.2</i>	<i>95.4</i>	<i>95.0</i>
<i>Total under crops (cereals, fruit and horticulture)</i>	<i>365.6</i>	<i>357.0</i>	<i>356.7</i>

Crop or pasture	June 2017	June 2018	June 2019
Silage	1,088.9	1,064.5	1,088.7
Hay	192.1	191.9	180.8
Pasture	2,322.7	2,378.7	2,376.7
<i>Total under pasture</i>	<i>3,603.7</i>	<i>3,635.1</i>	<i>3,646.2</i>
<i>Total under crops and pasture</i>	<i>3,969.3</i>	<i>3,992.2</i>	<i>4,002.8</i>
Rough grazing in use	520.2	524.1	521.5
Total area farmed	4,489.5	4,516.3	4,524.4

* In Table 3.11, “other crops” includes crops not specified elsewhere in the table. Miscanthus, fallow land (land that has been ploughed but left unsown to “rest” and recover some nutrients) and wild bird cover account for over 80.0 per cent of this area.

4 Food, drinks and household commodities and services prices and consumer expenditure

Food and drinks prices and consumer expenditure

Northern Ireland food and drinks prices and consumer expenditure

The Minimal Essential Standard of Living (MESL) is a standard of living that no one should be expected to live below. It is decided by members of the public who agree on what is needed to live at an acceptable, dignified standard and participate in society, meeting the physical, psychological and social needs of individuals and households. It applies to everyone and not just those in poverty. It takes into account the actual weekly cost of over 2,000 goods and services that are needed to enable a socially acceptable minimum standard of living. As such, it complements other poverty measures.

Research carried out by the Food Standards Agency in Northern Ireland (FSA) to establish the cost of a food basket that meets the MESL in Northern Ireland found that the cost of the MESL increased between 2016 and 2018 by between 4.2 per cent and 4.6 per cent. The proportion of income that households needed to spend on a food basket in 2018 ranged from 26.0 per cent to 46.0 per cent of “take-home” pay (that is, earnings after taxes and other deductions) (Table 4.1). Those who depend solely on state benefits were reported to spend the highest proportion of their income on food [37].

“Consensual budget standards methodology” was used to establish the average weekly cost of the food element of a MESL for 4 household types in Northern Ireland, adjusted to reflect food costs in 2018. A low-income scenario was used to establish the percentage of take-home pay spent on a healthy food basket for the household types.

The UK Consumer Price Index (CPI) – the official measure of inflation in consumer prices in the UK – was used to update the cost for 2018.

Table 4.1: Weekly cost of a minimum essential food basket in pounds sterling (£) and cost as a percentage of take-home income for 4 household types in Northern Ireland in 2016 and 2018 [38]

Household type	Cost 2016 (£)	Cost 2018 (£)	Percentage change	Income scenario	Cost as a % of take-home income: 2016	Cost as a % of take-home income: 2018
2 parents and 2 children (pre-school and primary school age)	115	120	+4.4	State benefits	33	34
				One adult employed, earning National Living Wage	24	26
2 parents and 2 children (primary school and secondary school age)	153	159	+4.2	State benefits	44	46
				One adult employed, earning National Living Wage	31	35
1 parent and 2 children (pre-school and primary school age)	99	103	+4.4	State benefits	32	33
				One adult employed, earning National Living Wage		
1 pensioner (female)	57	60	+4.6	State pension	34	33

In Northern Ireland, meat accounts for the largest proportion of the food costs in the minimum essential food basket (MEFB) across each household type – around a quarter of food costs for households with children and around a fifth for a female pensioner living alone (Table 4.2).

Table 4.2: Weekly cost of a minimum essential food basket (MEFB) by food or drink category in pounds sterling (£) and cost as a percentage of total food basket for 4 household types in Northern Ireland in 2018 [38]

	2 parents and 2 children (pre-school and primary school age)	2 parents and 2 children (pre-school and primary school age)	2 parents and 2 children (primary school and secondary school age)	2 parents and 2 children (primary school and secondary school age)	1 parent and 2 children (pre-school and primary school age)	1 parent and 2 children (pre-school and primary school age)	1 female pensioner	1 female pensioner
	Weekly cost of items in a MEFB in Northern Ireland in pounds sterling (£)	Cost as a percentage (%) of total MEFB	Weekly cost of items in a MEFB in Northern Ireland in pounds sterling (£)	Cost as a percentage (%) of total MEFB	Weekly cost of items in a MEFB in Northern Ireland in pounds sterling (£)	Cost as a percentage (%) of total MEFB	Weekly cost of items in a MEFB in Northern Ireland in pounds sterling (£)	Cost as a percentage (%) of total MEFB
Bread and cereals	12.97	11	16.22	10	11.58	11	2.38	4
Meat	29.60	25	41.34	26	24.73	24	11.33	19
Fish	4.10	3	4.58	3	2.68	3	2.33	4
Milk, cheese and eggs	13.22	11	10.12	6	9.57	9	3.67	6
Oils and fats	1.73	1	3.84	2	2.73	3	0.55	1
Fruit	13.93	12	13.54	8	9.98	10	3.13	5
Vegetables including potatoes and tubers	13.36	11	17.51	11	12.02	12	9.08	15

	2 parents and 2 children (pre-school and primary school age)	2 parents and 2 children (pre-school and primary school age)	2 parents and 2 children (primary school and secondary school age)	2 parents and 2 children (primary school and secondary school age)	1 parent and 2 children (pre-school and primary school age)	1 parent and 2 children (pre-school and primary school age)	1 female pensioner	1 female pensioner
	Weekly cost of items in a MEFB in Northern Ireland in pounds sterling (£)	Cost as a percentage (%) of total MEFB	Weekly cost of items in a MEFB in Northern Ireland in pounds sterling (£)	Cost as a percentage (%) of total MEFB	Weekly cost of items in a MEFB in Northern Ireland in pounds sterling (£)	Cost as a percentage (%) of total MEFB	Weekly cost of items in a MEFB in Northern Ireland in pounds sterling (£)	Cost as a percentage (%) of total MEFB
Sugar, jams and syrups	0.47	0	0.92	1	1.17	1	0.00	0
Food products not classified elsewhere	1.21	1	3.17	2	3.46	3	1.85	3
Coffee, tea and cocoa	2.04	2	4.04	3	1.61	2	1.13	2
Mineral waters, soft drinks and juices	2.25	2	2.68	2	1.36	1	0.00	0
Alcoholic beverages	8.46	7	10.28	6	6.17	6	3.98	7
Takeaway	5.44	5	6.64	4	3.99	4	3.26	5
Treats	3.95	3	3.14	2	3.24	3	2.49	4
School lunch and milk	6.26	5	19.99	13	8.04	8	0.00	0

	2 parents and 2 children (pre-school and primary school age)	2 parents and 2 children (pre-school and primary school age)	2 parents and 2 children (primary school and secondary school age)	2 parents and 2 children (primary school and secondary school age)	1 parent and 2 children (pre-school and primary school age)	1 parent and 2 children (pre-school and primary school age)	1 female pensioner	1 female pensioner
	Weekly cost of items in a MEFB in Northern Ireland in pounds sterling (£)	Cost as a percentage (%) of total MEFB	Weekly cost of items in a MEFB in Northern Ireland in pounds sterling (£)	Cost as a percentage (%) of total MEFB	Weekly cost of items in a MEFB in Northern Ireland in pounds sterling (£)	Cost as a percentage (%) of total MEFB	Weekly cost of items in a MEFB in Northern Ireland in pounds sterling (£)	Cost as a percentage (%) of total MEFB
Extra for visitors	0.00	0	0.00	0	0.00	0	10.06	17
Extra for Christmas	1.16	1	1.41	1	0.01	1	0.48	1
Eating out	0.00	0	0.00	0	0.00	0	4.05	7
Total	120.17	100	159.44	100	103.33	100	59.76	100

Tables 4.3, 4.4 and 4.5 provide an overview of the changing costs of various categories of food and drinks per week for each of the 4 different household types that were included in the study.

Table 4.3: Weekly cost of a minimum essential food basket by food or drinks category in pounds sterling (£) for a household of 2 parents and 2 children (pre-school and primary school age) in Northern Ireland from 2014 to 2018 [38]

Food or drinks category	2014	2015	2016	2017	2018
Bread and cereals	12.85	12.80	12.55	12.72	12.97
Meat	30.18	30.01	28.69	28.69	29.60
Fish	3.95	3.83	3.63	3.95	4.10
Milk, cheese and eggs	13.47	13.08	12.53	12.64	13.22
Oils and fats	1.54	1.48	1.37	1.59	1.73
Fruit	13.43	13.05	13.30	13.47	13.93
Vegetables	13.52	13.57	13.01	13.24	13.36
Sugar, jams and syrups	0.46	0.46	0.45	0.46	0.47
Food products not classified elsewhere	1.19	1.18	1.18	1.20	1.21
Coffee, tea and cocoa	1.89	1.88	1.89	1.95	2.04
Mineral waters, soft drinks, etc	2.27	2.29	2.26	2.17	2.25
Alcoholic beverages	8.49	8.56	8.23	8.40	8.46

Food or drinks category	2014	2015	2016	2017	2018
Takeaway	5.00	5.02	5.11	5.26	5.44
Treats	3.93	3.89	3.78	3.84	3.95
School lunch and milk	5.83	5.83	6.05	6.05	6.26
Extra for Christmas	1.15	1.14	1.11	1.13	1.16
Total	119.17	118.09	115.14	116.75	120.17

Table 4.4: Weekly cost of a minimum essential food basket by food or drinks category in pounds sterling (£) for households of 2 parents and 2 children (primary school and secondary school age), and 1 parent and 2 children (pre-school and primary school age), in Northern Ireland from 2016 to 2018 [38]

Food or drinks category	2016	2016	2017	2017	2018	2018
	Household of 2 parents and 2 children (primary school and secondary school age)	Household of 1 parent and 2 children (pre-school and primary school age)	Household of 2 parents and 2 children (primary school and secondary school age)	Household of 1 parent and 2 children (pre-school and primary school age)	Household of 2 parents and 2 children (primary school and secondary school age)	Household of 1 parent and 2 children (pre-school and primary school age)
Bread and cereals	15.69	11.21	15.91	11.36	16.22	11.58
Meat	40.06	23.96	40.06	23.96	41.34	24.73
Fish	4.05	2.37	4.40	2.58	4.58	2.68
Milk, cheese and eggs	9.59	9.06	9.68	9.15	10.12	9.57
Oils and fats	3.05	2.17	3.52	2.51	3.84	2.73
Fruit	12.93	9.53	13.10	9.65	13.54	9.98
Vegetables	17.05	11.71	17.35	11.92	17.51	12.02
Sugar, jams and syrups	0.89	1.12	0.89	1.13	0.92	1.17

Food or drinks category	2016	2016	2017	2017	2018	2018
	Household of 2 parents and 2 children (primary school and secondary school age)	Household of 1 parent and 2 children (pre-school and primary school age)	Household of 2 parents and 2 children (primary school and secondary school age)	Household of 1 parent and 2 children (pre-school and primary school age)	Household of 2 parents and 2 children (primary school and secondary school age)	Household of 1 parent and 2 children (pre-school and primary school age)
Food products not classified elsewhere	3.09	3.37	3.14	3.43	3.17	3.46
Coffee, tea and cocoa	3.75	1.49	3.88	1.54	4.04	1.61
Mineral waters, soft drinks	2.70	1.37	2.58	1.31	2.68	1.36
Alcoholic beverages	10.00	6.00	10.20	6.12	10.28	6.17
Takeaway	6.25	3.75	6.43	3.86	6.64	3.99
Treats	3.00	3.09	3.05	3.14	3.14	3.24
School lunch and milk	19.57	7.83	19.57	7.83	19.99	8.04
Extra for Christmas	1.35	0.96	1.37	0.98	1.41	1.01
Total	153.00	99.00	155.14	100.46	159.44	103.33

Table 4.5: Weekly cost of a minimum essential food basket by food or drinks category in pounds sterling (£) for a household of 1 female pensioner in Northern Ireland from 2014 to 2018 [38]

Food or drinks category	2014	2015	2016	2017	2018
Bread and cereals	2.35	2.35	2.30	2.33	2.38
Meat	11.55	11.48	10.98	10.98	11.33
Fish	2.24	2.17	2.06	2.24	2.33
Milk, cheese and eggs	3.74	3.63	3.48	3.51	3.67
Oils and fats	0.49	0.47	0.44	0.51	0.55
Fruit	3.02	2.94	2.99	3.03	3.13
Vegetables	9.18	9.21	8.84	8.99	9.08
Sugar, jams and syrups	0.00	0.00	0.00	0.00	0.00
Food products not classified elsewhere	1.82	1.80	1.80	1.83	1.85
Coffee, tea and cocoa	1.05	1.04	1.05	1.08	1.13
Mineral waters, soft drinks and juices	0.00	0.00	0.00	0.00	0.00
Alcoholic beverages	3.99	4.02	3.87	3.95	3.98
Takeaway	3.00	3.01	3.07	3.06	3.26
Treats	2.47	2.45	2.38	2.41	2.49
Extra for visitors	10.00	9.91	9.61	9.77	10.06
Extra for Christmas	0.48	0.48	0.46	0.47	0.48
Eating out	3.75	3.76	3.84	3.94	4.05
Total	59.13	58.73	57.14	58.19	59.76

Ireland food and drinks prices and consumer expenditure

Table 4.6 provides an overview of the minimum cost of a healthy food basket in Ireland for the years 2016 and 2018 for 6 different household types with 2 low-income scenarios: dependent on state benefits, or with 1 adult employed and earning the National Minimum Wage. The average weekly cost of a minimum healthy food basket decreased between 2016 and 2018 by 4.4 per cent.

Table 4.6: Weekly cost of a minimum essential food basket (MEFB) in euro (€) and cost as a percentage of take-home income for 6 household types in 2 low-income scenarios in Ireland in 2016 and 2018 [39,40]

Household type	Weekly cost of MEFB in Ireland (€): 2016	Weekly cost of MEFB in Ireland (€): 2018	Cost as a % of take-home income for a household dependent on state benefits:2016	Cost as a % of take-home income for a household dependent on state benefits: 2018	Cost as a % of take-home income for a household with 1 adult earning National Minimum Wage: 2016	Cost as a % of take-home income for a household with 1 adult earning National Minimum Wage: 2018
2 parents and 2 children (pre-school and primary school age)	133	128	30	28	23	22
2 parents and 2 children (primary and secondary school age)	160	153	36	33	28	26
1 parent and 2 children (pre-school and primary school age)	101	97	31	28	16	15
1 adult	55	53	29	27	17	15
1 female pensioner	64	53	26	23	Does not apply	Does not apply
2 pensioners (who are a couple)	86	83	21	19	Does not apply	Does not apply

Table 4.7 provides an overview of changes in the cost of food and non-alcoholic beverages for March 2019 and includes the average price change – as measured by the Consumer Price Index (CPI) in Ireland – since the previous month and over the previous 12-month period.

The CPI measures the overall change in the prices of frequently purchased goods and services, including foodstuffs, collecting data on around 53,000 prices each month. The goods and services that are included are determined from the CSO’s Household Budget Survey and represent an average household in Ireland 41].

Table 4.7: Change in cost of food and non-alcoholic beverages prices as a percentage over 12 months in Ireland from March 2018 to March 2019 [42]

Ireland Consumer Price Index category	Average change in cost of food and non-alcoholic beverages in Ireland since previous month, as of March 2019, as a percentage (%)	Change in cost over 12 months from March 2018 to March 2019 as a percentage (%)
Overall	+0.8	+1.1
Food and non-alcoholic beverages	+0.4	-0.6
Food	+0.3	-0.7
Beef and veal	+3.7	-1.5
Pork	+1.9	-3.6
Lamb and goat	-0.6	-4.0
Poultry	-0.5	-1.3
Other meat preparations	-0.5	-0.9
Fish	-1.4	-0.4
Bread and cereals	+0.9	-0.6
Fresh whole milk	0.0	-0.2
Other milk products	+0.2	-3.5
Cheese and curd	-1.9	-3.4
Eggs	-0.3	-0.5
Butter	-1.1	-1.1

Ireland Consumer Price Index category	Average change in cost of food and non-alcoholic beverages in Ireland since previous month, as of March 2019, as a percentage (%)	Change in cost over 12 months from March 2018 to March 2019 as a percentage (%)
Sugar	-0.2	-6.3
Potatoes	-0.6	+16.1
Other fresh or chilled vegetables	+0.5	-1.6
Fresh or chilled fruit	+0.4	-1.7
Tea, coffee and cocoa	+0.3	-2.8
Mineral waters, soft drinks and juices	+1.5	+0.5
Non-alcoholic beverages	+1.2	-0.3

United Kingdom food and drinks prices and consumer expenditure

An overview of average weekly expenditure and total weekly expenditure by UK households on food and non-alcoholic drinks is shown in Tables 4.8 and 4.9. Expenditure is broken down by place of purchase: large supermarket chains, other outlets and the Internet.

Large supermarket chains are the most common place where UK households purchase food and non-alcoholic drinks, with average weekly expenditures of £44.60 and £4.10, respectively.

The data were captured using the UK Office for National Statistics' (ONS) Living Costs and Food Survey, which is a voluntary sample survey of private households. Each individual in a selected household is asked to complete a household interview and then an expenditure diary for 2 weeks.

Table 4.8: Weekly expenditure on food by category and place of purchase in the United Kingdom in pounds sterling (£) in 2019 [43]

Food category	Large supermarket chains*	Large supermarket chains*	Large supermarket chains*	Other outlets	Other outlets	Other outlets	Internet**	Internet**	Internet**
	Average weekly expenditure on food for all households in pounds sterling (£)	Total weekly expenditure on food in the United Kingdom in millions of pounds sterling (£)	Number of recording households in Living Costs and Food Survey sample	Average weekly expenditure on food for all households in pounds sterling (£)	Total weekly expenditure on food in the United Kingdom in millions of pounds sterling (£)	Number of recording households in Living Costs and Food Survey sample	Average weekly expenditure on food for all households in pounds sterling (£)	Total weekly expenditure on food in the United Kingdom in millions of pounds sterling (£)	Number of recording households in Living Costs and Food Survey sample
Food	44.60	1,226	5,330	8.30	229	4,660	3.60	99	550
Bread, rice and cereals	4.40	122	5,090	0.70	20	2,290	0.30	10	450
Pasta products	0.30	10	2,080	0.10	2	420	0.00~	1	200
Buns, cakes, biscuits and so on	3.10	86	4,630	0.60	16	1,950	0.20	6	350
Pastry (savoury)	0.90	24	2,100	0.00~	1	260	0.10	2	140

Food category	Large supermarket chains*	Large supermarket chains*	Large supermarket chains*	Other outlets	Other outlets	Other outlets	Internet**	Internet**	Internet**
	Average weekly expenditure on food for all households in pounds sterling (£)	Total weekly expenditure on food in the United Kingdom in millions of pounds sterling (£)	Number of recording households in Living Costs and Food Survey sample	Average weekly expenditure on food for all households in pounds sterling (£)	Total weekly expenditure on food in the United Kingdom in millions of pounds sterling (£)	Number of recording households in Living Costs and Food Survey sample	Average weekly expenditure on food for all households in pounds sterling (£)	Total weekly expenditure on food in the United Kingdom in millions of pounds sterling (£)	Number of recording households in Living Costs and Food Survey sample
Beef (fresh, chilled or frozen)	1.40	39	2,040	0.40	10	560	0.10	3	180
Pork (fresh, chilled or frozen)	0.40	11	950	0.10	3	250	0.00~	1	60
Lamb (fresh, chilled or frozen)	0.30	8	450	0.30	7	190	0.00~	1	30
Poultry (fresh, chilled or frozen)	1.70	48	2,570	0.50	12	620	0.10	4	200
Bacon and ham	0.70	18	2,020	0.10	3	480	0.10	2	150

Food category	Large supermarket chains*	Large supermarket chains*	Large supermarket chains*	Other outlets	Other outlets	Other outlets	Internet**	Internet**	Internet**
	Average weekly expenditure on food for all households in pounds sterling (£)	Total weekly expenditure on food in the United Kingdom in millions of pounds sterling (£)	Number of recording households in Living Costs and Food Survey sample	Average weekly expenditure on food for all households in pounds sterling (£)	Total weekly expenditure on food in the United Kingdom in millions of pounds sterling (£)	Number of recording households in Living Costs and Food Survey sample	Average weekly expenditure on food for all households in pounds sterling (£)	Total weekly expenditure on food in the United Kingdom in millions of pounds sterling (£)	Number of recording households in Living Costs and Food Survey sample
Other meats and meat preparations	5.40	147	4,530	0.80	23	1,660	0.40	11	390
Fish and fish products	2.40	67	3,250	0.40	10	690	0.20	5	250
Milk	1.60	45	4,470	0.40	11	1,630	0.10	4	350
Cheese and curd	1.70	48	3,680	0.20	4	760	0.20	5	320
Eggs	0.60	15	2,760	0.10	3	690	0.10	1	230
Other milk products	2.00	55	4,060	0.10	3	890	0.20	5	340
Butter	0.40	11	1,360	0.00~	1	250	0.00~	1	110

Food category	Large supermarket chains*	Large supermarket chains*	Large supermarket chains*	Other outlets	Other outlets	Other outlets	Internet**	Internet**	Internet**
	Average weekly expenditure on food for all households in pounds sterling (£)	Total weekly expenditure on food in the United Kingdom in millions of pounds sterling (£)	Number of recording households in Living Costs and Food Survey sample	Average weekly expenditure on food for all households in pounds sterling (£)	Total weekly expenditure on food in the United Kingdom in millions of pounds sterling (£)	Number of recording households in Living Costs and Food Survey sample	Average weekly expenditure on food for all households in pounds sterling (£)	Total weekly expenditure on food in the United Kingdom in millions of pounds sterling (£)	Number of recording households in Living Costs and Food Survey sample
Margarine, other vegetable fats and peanut butter	0.50	14	2,080	0.00~	1	340	0.00~	1	170
Cooking oils and fats	0.30	99	4,690	0.50	12	1,320	0.30	9	400
Fresh fruit	3.50	97	4,480	0.30	8	1,150	0.20	7	380
Other fresh, chilled or frozen fruits	0.40	11	1,540	0.00~	1	280	0.00~	1	130
Dried fruits and nuts	0.70	18	1,740	0.20	4	490	0.00~	1	110

Food category	Large supermarket chains*	Large supermarket chains*	Large supermarket chains*	Other outlets	Other outlets	Other outlets	Internet**	Internet**	Internet**
	Average weekly expenditure on food for all households in pounds sterling (£)	Total weekly expenditure on food in the United Kingdom in millions of pounds sterling (£)	Number of recording households in Living Costs and Food Survey sample	Average weekly expenditure on food for all households in pounds sterling (£)	Total weekly expenditure on food in the United Kingdom in millions of pounds sterling (£)	Number of recording households in Living Costs and Food Survey sample	Average weekly expenditure on food for all households in pounds sterling (£)	Total weekly expenditure on food in the United Kingdom in millions of pounds sterling (£)	Number of recording households in Living Costs and Food Survey sample
Preserved fruit and fruit-based products	0.10	4	750	0.00~	0.00~	120	0.00~	0.00~	60
Fresh vegetables	3.60	99	4,690	0.50	12	1,320	0.30	9	400
Dried vegetables and other preserved and processed vegetables	0.70	20	3,040	0.10	26	2,930	0.10	3	290
Potatoes	0.60	17	2,950	0.10	2	680	0.00~	1	220
Other tubers and products of tuber vegetables	1.50	42	3,730	0.20	4	1,130	0.10	3	290

Food category	Large supermarket chains*	Large supermarket chains*	Large supermarket chains*	Other outlets	Other outlets	Other outlets	Internet**	Internet**	Internet**
	Average weekly expenditure on food for all households in pounds sterling (£)	Total weekly expenditure on food in the United Kingdom in millions of pounds sterling (£)	Number of recording households in Living Costs and Food Survey sample	Average weekly expenditure on food for all households in pounds sterling (£)	Total weekly expenditure on food in the United Kingdom in millions of pounds sterling (£)	Number of recording households in Living Costs and Food Survey sample	Average weekly expenditure on food for all households in pounds sterling (£)	Total weekly expenditure on food in the United Kingdom in millions of pounds sterling (£)	Number of recording households in Living Costs and Food Survey sample
Sugar and sugar products	0.30	8	1,440	0.10	2	410	0.00	1	110
Jams and marmalades	0.20	6	1,220	0.10	1	280	0.00	0	80
Chocolate	1.50	42	3,110	0.50	13	1,510	0.10	2	170
Confectionery	0.50	14	2,100	0.30	8	1,180	0.00	1	100
Edible ices and ice cream	0.70	18	1,770	0.10	2	330	0.10	1	130
Other food products	2.00	54	4,120	0.50	13	1,380	0.20	7	380

* In 2011, the list of large supermarket chains was updated.

** Includes internet expenditure in large supermarket chains.

Table 4.9: Weekly expenditure on non-alcoholic drinks by category and place of purchase in the United Kingdom in pounds sterling (£) in 2019 [43]

Drinks category	Large supermarket chains *	Large supermarket chains *	Large supermarket chains *	Other outlets	Other outlets	Other outlets	Internet **	Internet **	Internet **
	Average weekly expenditure on non-alcoholic drinks for all households in pounds sterling (£)	Total weekly expenditure on food and drinks in the United Kingdom in millions of pounds sterling (£)	Number of recording households in Living Costs and Food Survey sample	Average weekly expenditure on non-alcoholic drinks for all households in pounds sterling (£)	Total weekly expenditure on food and drinks in the United Kingdom in millions of pounds sterling (£)	Number of recording households in Living Costs and Food Survey sample	Average weekly expenditure on non-alcoholic drinks for all households in pounds sterling (£)	Total weekly expenditure on food and drinks in the United Kingdom in millions of pounds sterling (£)	Number of recording households in Living Costs and Food Survey sample
Non-alcoholic drinks	4.10	112	4,620	0.80	23	2,230	0.40	11	410
Coffee	0.70	21	1,660	0.10	4	460	0.10	3	130
Tea	0.30	9	1,240	0.10	2	370	0.00	1	100
Cocoa and powdered chocolate	0.10	2	300	0.00~	1	80	0.00	0.00~	30

Drinks category	Large supermarket chains *	Large supermarket chains *	Large supermarket chains *	Other outlets	Other outlets	Other outlets	Internet **	Internet **	Internet **
	Average weekly expenditure on non-alcoholic drinks for all households in pounds sterling (£)	Total weekly expenditure on food and drinks in the United Kingdom in millions of pounds sterling (£)	Number of recording households in Living Costs and Food Survey sample	Average weekly expenditure on non-alcoholic drinks for all households in pounds sterling (£)	Total weekly expenditure on food and drinks in the United Kingdom in millions of pounds sterling (£)	Number of recording households in Living Costs and Food Survey sample	Average weekly expenditure on non-alcoholic drinks for all households in pounds sterling (£)	Total weekly expenditure on food and drinks in the United Kingdom in millions of pounds sterling (£)	Number of recording households in Living Costs and Food Survey sample
Fruit and vegetable juices (including fruit squash)	0.90	25	2,770	0.10	2	570	0.10	3	260
Mineral or spring waters	0.30	9	1,380	0.10	2	390	0.00	1	100
Soft drinks	1.70	47	3,160	0.50	13	1,530	0.10	4	230

* In 2011, the list of large supermarket chains was updated.

** Includes internet expenditure in large supermarket chains.

Household commodities and services prices and consumer expenditure

Northern Ireland and United Kingdom household commodities and services prices and consumer expenditure

The average household in Northern Ireland spent a weekly average of £63.20 on food and non-alcoholic drinks between 2016 and 2018 (Table 4.10).

Table 4.10: Average weekly household expenditure on commodities and services in pounds sterling (£) in Northern Ireland between 2016 and 2018 [44]

Commodity or service	Average weekly household expenditure in pounds sterling (£) in Northern Ireland between 2016 and 2018
Food and non-alcoholic drinks	63.20
Alcoholic drinks, tobacco and narcotics	16.30
Clothing and footwear	30.90
Housing (excluding mortgage interest payments and Northern Ireland rates), fuel and power	53.40
Household goods and services	31.50
Health	6.40
Transport	72.70
Communication	17.20
Recreation and culture	53.70
Education	5.60
Restaurants and hotels	46.80
Miscellaneous goods and services	40.90
All expenditure groups	438.60
Other expenditure items	50.50
Total expenditure	489.10
Average weekly expenditure per person	199.60

Table 4.11 lists the price level results of each region of the UK relative to the national price level (the UK equals “100”) according to the “Classification of Individual Consumption According to Purpose” (COICOP) division level for 2016 [45].

The COICOP is the international reference classification of household expenditure. It was developed by the United Nations Statistics Division to classify and analyse individual

consumption expenditures incurred by households, non-profit institutions serving households and general government, according to their purpose. It includes categories such as clothing and footwear, housing, water, electricity and gas and other fuels. The COICOP divides goods and services according to their purpose for use or consumption.

Table 4.11: United Kingdom regional price level of household expenditure relative to national price level (where United Kingdom equals “100”), by Classification of Individual Consumption According to Purpose division, in 2016 [46]

Classification of Individual Consumption According to Purpose division	London	England (excluding London)	Scotland	Wales	Northern Ireland
Food and non-alcoholic beverages	102.2	97.6	99.8	100.8	99.7
Alcohol and tobacco	103.0	96.8	99.4	102.3	98.6
Clothing and footwear	103.5	101.3	99.2	97.7	98.5
Household and housing services (excluding rental costs and costs associated with owner-occupied housing)	105.1	98.7	99.7	99.6	97.0
Furniture and household goods	112.2	97.4	103.2	95.5	99.8
Transport	103.3	100.4	99.7	100.6	96.1
Communication	100.0	100.0	100.0	100.0	100.0
Recreation and culture	143.8	96.2	101.4	96.8	95.8
Restaurant and culture	113.0	97.4	100.4	95.1	98.3
Miscellaneous goods and services	110.5	99.7	104.8	96.2	93.4
All divisions	107.0	98.7	100.4	98.5	97.7

According to the Which?® Consumer Insight Report 2019 Northern Ireland, which analysed ONS Living Costs and Food Survey data, weekly consumer expenditure in Northern Ireland averaged £557 – £90 lower than the UK average of £647 [47].

The same report found that the largest proportion of people in Northern Ireland were most likely to expect to increase their spending on 3 commodities, including the weekly food shop (34.0 per cent of people) (Table 4.12).

Table 4.12: Proportion of Northern Ireland and United Kingdom consumers expecting to increase household expenditure by commodity or service, in 2019 [47]

Commodity or service	Northern Ireland	United Kingdom
Energy	43	33
Running a car	37	31
Groceries	34	28
Home improvements	27	23
Housing (rent or mortgage)	20	18
Public transport	18	16
Clothing and footwear	17	14

Table 4.13 sets out the proportion of households in Northern Ireland and in the UK that were spending on the listed commodities and services, based on Living Costs and Food Survey participant households who kept detailed diaries of their outgoings over a two-week period.

Table 4.13: Proportion of Northern Ireland and United Kingdom households who were spending on selected commodities and services over a two-week period in 2019 [47]

Commodity or service	Northern Ireland	United Kingdom
Meat	98	93
Vegetables	97	96
Restaurants and takeaway	92	86
Confectionery	91	87
Petrol and diesel	74	61
Clothing and footwear	73	65
Furniture	51	41
Tobacco	28	17
Bank charges	25	34
Appliances	11	8

Ireland household commodities and services prices and consumer expenditure

Data for Ireland on household expenditure on commodities and services is presented in the CSO's Household Budget Survey, which is conducted every 5 years. The data presented here are from 2015 to 2016 (Tables 4.14 and 4.15), the most recent dataset available when the compendium was being compiled.

Table 4.14: Average weekly household expenditure on commodities and services in euro (€) in Ireland from 2015 to 2016 **[48]**

Commodity or service	Average weekly household expenditure in euro (€) in Ireland from 2015 to 2016
Total expenditure	837.47
Food and non-alcoholic beverages	123.28
Alcoholic beverages and tobacco	28.00
Clothing and footwear	33.65
Fuel and light	38.56
Housing	164.36
Household non-durable goods	16.51
Transport	124.39
Miscellaneous goods, services and other expenditure	281.21

Table 4.15. Average weekly household expenditure on food and drinks, including takeaway and meals away from home, in euro (€) in Ireland from 2015 to 2016 [48]

Type of food and drinks expenditure	Average weekly household expenditure on food and drinks in euro (€) in Ireland from 2015 to 2016
Total food consumed at home	93.23
Bread	5.21
Flour	0.22
Pastries and biscuits	6.22
Breakfast cereals	1.82
Milk, cream, yoghurt and cheese	9.72
Butter, fats and cooking oil	2.21
Eggs	1.37
Pasta, pizza, quiche and grains	2.26
Meat	21.04
Fish	3.28
Fruit and nuts	7.20
Vegetables	9.83
Sugars, confectionery and snacks	8.60
Other food items	5.27
Non-alcoholic beverages	6.87
Takeaway food brought or delivered to home	5.90
Meals away from home (including takeaway tea or coffee)	26.27

Island of Ireland household commodities and services prices and consumer expenditure

Table 4.16 provides a comparison of the average household weekly expenditure on food and non-alcoholic drink, meals outside of the home, and alcoholic drink and tobacco for each jurisdiction on the island of Ireland.

Expenditure on narcotics is included for Northern Ireland only.

Data are currently unavailable to compare Northern Ireland with Ireland year on year; however, data on average weekly expenditure are provided for Northern Ireland for the years 2014 to 2016 and 2016 to 2018 to provide a better overview of expenditure changes over time for that jurisdiction.

Prices in Northern Ireland were converted from pounds sterling to euro using an exchange rate of £1 to €1.11, as of 5 July 2020.

Table 4.16: Average weekly household expenditure on food and drinks, meals away from home, and alcoholic drinks, tobacco and narcotics across the island of Ireland in euro (€) from 2014 to 2018 [48] [49]

Jurisdiction	Food and non-alcoholic drinks	Meals away from home	Alcoholic drinks and tobacco (and narcotics for Northern Ireland only)	Total
Northern Ireland, from 2016 to 2018	70.05	No data	17.98	87.98
Northern Ireland, from 2014 to 2016	71.27	No data	17.32	87.59
Ireland, from 2015 to 2016	93.23	26.27	28.00	147.50

Grocery market share

The following data provide an overview of the share of the market for each of the main supermarkets on the island of Ireland.

“Market share” is the percentage of total sales made by a particular company in an industry. It is calculated by dividing a company’s sales by total sales for the industry and then multiplying the result by 100.

Northern Ireland grocery market share

Table 4.17 provides an overview of the grocery market share in Northern Ireland for each of the main supermarkets. The figures include expenditure across food, drinks, alcohol, household, and health and beauty categories.

Table 4.17: Grocery market share of grocers in Northern Ireland in the year to 9 September 2018 and the year to 8 September 2019 [50]

Retailer	Grocery market share as a percentage (%) of total for all grocers	Grocery market share as a percentage (%) of total for all grocers	Change in value of sales as a percentage (%)
Total for all grocers	100.0	100.0	1.0
Tesco®	35.3	35.0	0.1
Sainsbury's®	17.3	17.1	-0.2
Asda®	17.1	16.8	-0.7
Lidl®	5.7	6.1	7.6
Other outlets*	7.9	8.2	4.7

* "Other outlets" in Table 3.22 includes stores such as Boots®, greengrocers and butchers.

Ireland grocery market share

By June 2020, SuperValu® held 22.9 per cent of the Irish grocery market share, closely followed by Tesco®, at 21.5 per cent, and Dunnes Stores®, at 20.6 per cent (Table 4.18).

Table 4.18: Grocery market share of main supermarkets in Ireland in the 12 weeks to 14 June 2020 [51]

Retailer	Grocery market share in Ireland in the 12 weeks to 14 June 2020 as a percentage (%)
SuperValu®	22.9
Tesco®	21.5
Dunnes Stores®	20.6
Aldi®	11.9
Lidl®	12.2
Other retailers	11.0

Online grocery shopping

Online grocery shopping in Ireland and the United Kingdom

In the second quarter of 2018, the weekly value of online sales from food stores in the UK was valued at £179 million, up from £141.9 million in 2016 [52]. In 2018, the UK accounted for 7.9 per cent of the global online shopping market sector. Despite the continued growth of online grocery shopping in 2019, it accounted for less than 10.0 per cent of all grocery shopping in the UK [53]. However, it is anticipated that online grocery shopping in the UK will grow by 33.0 per cent in 2020 to reach an estimated value of £16.8 billion, up from £12.7 billion in 2019 [54].

Data analytics and brand consulting company Kantar® (Kantar Group, London) noted that, in the UK, online grocery sales increased by 91.0 per cent in June 2020, with around 5.7 million shoppers in the UK using online channels [55].

No Northern Ireland-specific data on online grocery shopping was available.

There is relatively scarce data available on the value of the online grocery market in Ireland but market intelligence from a number of sources show that online grocery sales have been increasing steadily over the past 10 years. For example, market and consumer data providers Statista® (based in Hamburg, Germany) note that the proportion of people in Ireland who have purchased groceries online increased from 2.0 per cent in 2009 to 9.0 per cent in 2019 [56]. The online grocery market then grew more rapidly in 2020, specifically during the period when restrictions were imposed on contact between people during the COVID-19 pandemic (known as “lockdown”).

Data from Kantar® indicates that, during the 12 weeks to 12 July 2020, online grocery shopping increased by 123.0 per cent, compared with the same period in 2019. An additional 75,000 shoppers purchased groceries online between May 2020 and July 2020, spending €38.9 million [57].

Data on the levels of online food shopping show a dramatic increase in online grocery shopping in March 2020, when the world was confronted with the COVID-19 pandemic and the UK and Ireland went into “lockdown”. For example, the value of monthly internet food sales in the UK increased by 20.9 per cent in March 2020, compared with February 2020, and by a further 85.7 per cent in April 2020, compared with March 2020 [58].

Online grocery shopping in the European Union and the United States

The value of online grocery shopping in the US generated sales in the region of 28.68 billion US dollars (\$) in 2019, with sales forecast to reach \$59.5 billion by 2023 [59].

Table 4.19 provides an overview of the proportion of global online grocery shopping for selected European and worldwide countries.

Table 4.19: Proportion of total global online grocery sales in selected countries in Europe and worldwide as a percentage in 2018 [60]

Country (Europe)	Proportion of total global online grocery sales as a percentage (%) in 2018	Country (worldwide)	Proportion of total global online grocery sales as a percentage (%) in 2018
Germany	2	United States	4
Spain	2	Japan	8
Denmark	3	Taiwan	9
Netherlands	5	China	14
France	6	South Korea	19
United Kingdom	7	n/a	n/a

Factors influencing consumers' food choices

There are many interrelated factors that may influence an individual's food choices or eating behaviours. Such factors extend beyond the biological (for example hunger). Factors that influence food behaviours include [61]

- Biological determinants such as hunger, appetite and taste
- Economic determinants such as cost, income and availability
- Physical determinants such as access, education, skills (for example cooking) and time
- Social determinants such as culture, family, peers and meal patterns
- Psychological determinants such as stress, mood and guilt
- Attitudes, beliefs and knowledge about food

For those on low incomes or with limited budgets, choices as to what items to purchase can be based primarily around the lowest price. Research into food poverty in Northern Ireland has also reported that those on lower incomes may buy cheaper but “satisfying” food [62].

Low-income consumers interviewed as part of that research for the FSA reported several coping strategies they used in order to feed a household on a limited budget.

Northern Ireland and United Kingdom factors influencing a decline in consumption of meat and dairy products

According to the FSA’s “Food and You” survey (2019), meat and dairy consumption continues to decline year on year. (The survey data are collected every 2 years in England, Wales and Northern Ireland and reflects these regions combined.) [63] This is despite only small proportions of survey respondents describing themselves as “completely vegetarian” or “vegan” (3.0 per cent and 1.0 per cent, respectively).

Data on market drivers suggests that consumers’ attitudes towards food impacts their purchasing behaviours. Some consumers are adopting a more “flexitarian” approach to their diet, due to health concerns [64].

Table 4.20 shows the decline in overall meat consumption in the UK between 2012 and 2018.

Table 4.20: Proportion of United Kingdom consumers eating different types of meat at least once a week as a percentage, by biennial survey wave, from 2012 to 2018 [63]

Type of meat	Survey wave 2 (2012)	Survey wave 3 (2014)	Survey wave 4 (2016)	Survey wave 5 (2018)
Cuts or portions of beef, lamb and pork	75	73	62	55
Chicken and turkey	86	87	83	81
Pre-cooked meats	65	63	54	52
Sausages	No data	No data	29	32
Burgers	No data	No data	13	17

The “Food and You” survey (2019) also asked participants to what extent they agreed that, *“People in the UK have to start eating less meat in order to ensure there is enough food to feed the population worldwide”*. Almost two-thirds of participants (37.0 per cent) agreed with this statement, almost the same proportion disagreed (36.0 per cent) and the remaining 27.0 per cent neither agreed nor disagreed.

Ireland factors influencing a decline in consumption of meat and dairy products

Research conducted by Bord Bia (an Irish state agency that promotes sales of Irish food and horticulture in Ireland and abroad) in 2018 into dietary lifestyles has also found that people in Ireland are reducing their intake of meat and dairy produce. The data presented here outline the drivers for reduced meat and dairy consumption.

In line with UK findings, “health” is reported as the top reason for reducing meat and dairy consumption, followed by “lifestyle change” (Table 4.21).

Table 4.21: Proportion of people who have consciously reduced meat or dairy consumption in Ireland in 2018 [65]

Product	Proportion of people who have consciously reduced meat or dairy consumption in Ireland in 2018 as a percentage (%)
Meat*	3,028 (76 per cent those surveyed)
Dairy**	1,943 (73 per cent those surveyed)

Tables 4.22 and 4.23 provide an overview of the available data on the extent to which consumers are changing their eating and why they are doing so.

Bord Bia’s Dietary Lifestyles Report (2018) revealed that over two-thirds of people in Ireland who are reducing their intake of meat are doing so for health reasons (Table 3.25).

Table 4.22. Reasons given for reducing meat consumption, as a percentage, in Ireland in 2018 [65]

Reason for reducing meat consumption	Proportion of people reducing meat consumption in Ireland in 2018 as a percentage (%)
Health	67
Lifestyle change	30
Environment	30
Animal welfare	27
Save money	17
Media influence	11

As shown in Table 4.23, over half of those who noted that they were reducing their intake of dairy were doing so for health reasons, confirming that “health” is the most pertinent reason why people are modifying their diet.

Table 4.23: Reasons given for reducing dairy consumption, as a percentage, in Ireland in 2018 [65]

Reasons for reducing dairy consumption	Proportion of people reducing dairy consumption in Ireland in 2018 as a percentage (%)
Health	56
Lifestyle change	31
To look better	16

Reasons for reducing dairy consumption	Proportion of people reducing dairy consumption in Ireland in 2018 as a percentage (%)
Animal welfare	16
Have more energy	16
Doctor's or other professional's advice	15
Environment	14

5 Consumer expenditure on food and drinks in relation to household income

Northern Ireland consumer expenditure on food and drinks in relation to household income

Northern Ireland household expenditure between 2015 and 2018 for different food and drinks product categories is shown in Table 5.1. Northern Irish households spent an average of £62.50 on food and non-alcoholic beverages in 2015 to 2017.

Table 5.1: Details of average weekly household expenditure on food and drinks in pounds sterling (£) in Northern Ireland for the years April 2016 to March 2018 and April 2015 to March 2017 [71] [66]

	2016 to 2018	2015 to 2017
Average weighted number of households (thousands)	750	750
Total number of households in sample (over 3 years)	950	710
Total number of persons in sample (over 3 years)	2,280	1,720
Total number of adults in sample (over 3 years)	1,760	1,320
Weighted average number of persons per household	2.5	2.5
Food or drinks product category	Expenditure 2016-2018 Pounds sterling (£)	Expenditure 2015-2017 Pounds sterling (£)
1. Food and non-alcoholic drinks	63.20	62.50
1.1 Food	57.60	57.40
1.1.1 Bread, rice and cereals	5.80	5.90
1.1.2 Pasta products	0.40	0.50
1.1.3 Buns, cakes, biscuits and so on	4.40	4.30
1.1.4 Pastry (savoury)	0.80	0.80
1.1.5 Beef (fresh, chilled or frozen)	3.40	3.50

1.1.6 Pork (fresh, chilled or frozen)	0.60	0.70
1.1.7 Lamb (fresh, chilled or frozen)	0.50	0.50
1.1.8 Poultry (fresh, chilled or frozen)	2.50	2.50
1.1.9 Bacon and ham	1.30	1.20
1.1.10 Other meat and meat preparations	7.40	7.40
1.1.11 Fish and fish products	2.20	2.10
1.1.12 Milk	2.60	2.50
1.1.13 Cheese and curd	1.60	1.60
1.1.14 Eggs	0.70	0.70
1.1.15 Other milk products	2.10	2.20
1.1.16 Butter	0.60	0.60
1.1.17 Margarine, other vegetable fats and peanut butter	0.40	0.40
1.1.18 Cooking oils and fats	0.30	0.30
1.1.19 Fresh fruit	3.80	3.80
1.1.20 Other fresh, chilled or frozen fruits	0.50	0.50
1.1.21 Dried fruit and nuts	0.60	0.60
1.1.22 Preserved fruit and fruit-based products	0.10	0.10
1.1.23 Fresh vegetables	3.30	3.30
1.1.24 Dried vegetables	0.00~	0.00~
1.1.25 Other preserved or processed vegetables	1.50	1.40
1.1.26 Potatoes	1.20	1.30
1.1.27 Other tubers and products of tuber vegetables	1.90	2.00
1.1.28 Sugar and sugar products	0.30	0.30
1.1.29 Jams and marmalades	0.40	0.30
1.1.30 Chocolate	2.30	2.20
1.1.31 Confectionery products	0.80	0.80

1.1.32 Edible ices and ice cream	0.70	0.60
1.1.33 Other food products	2.40	2.50
1.2 Non-alcoholic drinks	5.60	5.10
1.2.1 Coffee	1.00	0.90
1.2.2 Tea	0.60	0.50
1.2.3 Cocoa and powdered chocolate	0.10	0.00~
1.2.4 Fruit and vegetable juices (including fruit squash)	0.90	0.90
1.2.5 Mineral or spring waters	0.40	0.40
1.2.6 Soft drinks (including fizzy drinks and ready-to-drink fruit drinks)	2.60	2.30

Ireland consumer expenditure on food and drinks in relation to household income

In Ireland, detailed information on household and individual income, expenditure and living conditions is gathered in the CSO's Household Budget Survey. The estimated average weekly expenditure in 2015 to 2016 for all households in the State was €837.47. This is 3.3 per cent higher than the estimated figure of €810.61 in 2009 to 2010.

Levels of disadvantage or affluence were derived according to the Pobal HP Deprivation Index (the Pobal Haase-Pratschke Deprivation Index). The index is used to analyse Irish Health Survey questionnaire responses about health and health-related behaviours and uses census data to measure levels of disadvantage or affluence in a particular geographical area.

Consumer expenditure and household income

Northern Ireland consumer expenditure and household income

In social statistics, household incomes are divided into 5 equal groups or “quintiles” according to how much disposable income each person in a household has. These can be further divided into 10 equal groups or “deciles”.

Table 5.2 shows average weekly household expenditure on food and non-alcoholic drinks for each gross (pre-tax) income quintile group in Northern Ireland between 2014 and 2016.

Table 5.2: Average weekly household expenditure on food and non-alcoholic drinks by gross income quintile group in pounds sterling (£) in Northern Ireland from 2014 to 2016 [67,68]

Food or drinks category	Lowest income quintile group	Second income quintile group	Third income quintile group	Fourth income quintile group	Highest income quintile group	All households
Food	36.40	52.40	58.30	81.30	87.40	59.00
Non-alcoholic drinks	2.80	4.70	6.40	7.20	7.00	5.20
Total food and non-alcoholic drinks	39.10	57.10	64.70	88.50	94.40	64.20

Ireland consumer expenditure and household income

The CSO's Household Budget Survey for 2015 to 2016 revealed that households in very affluent (wealthy) areas had the highest overall weekly expenditure, with an average of €1,083.73 (Table 5.3). This is almost twice as much as the average weekly expenditure of very disadvantaged households, at €584.53. Out of the 9 commodity groups, households in very disadvantaged areas spent the least, except for on alcoholic drinks and tobacco, which accounted for €28.19 on average per week [69].

Levels of disadvantage or affluence were derived according to the Pobal HP Deprivation Index (the Pobal Haase-Pratschke Deprivation Index). The index is used to analyse Irish Health Survey questionnaire responses about health and health-related behaviours, and uses census data to measure levels of disadvantage or affluence in a particular geographical area.

Table 5.3: Average weekly household expenditure on 9 selected groups of commodities in euro (€) by level of deprivation in Ireland from 2015 to 2016 [69]

Commodity group	Households in very disadvantaged areas	Households in disadvantaged areas	Households in average-income areas	Households in affluent areas	Households in very affluent areas	Average for all households
Food	101.28	116.96	125.30	133.28	138.97	123.28
Alcoholic beverages and tobacco	28.19	23.47	26.52	30.28	31.30	28.00
Clothing and footwear	26.21	31.26	33.38	35.54	41.55	33.65
Fuel and light	34.31	38.04	41.58	40.92	38.02	38.56
Housing	107.91	125.46	149.77	178.79	255.71	164.36
Household non-durable goods	13.42	15.62	17.17	17.79	18.48	16.51
Household durable goods	21.73	25.38	28.68	30.74	30.84	27.50
Transport	84.88	118.81	140.59	144.46	133.17	124.39
Miscellaneous goods, services and other expenditure	166.60	239.20	285.05	315.00	395.67	281.21
Total expenditure	584.53	734.20	848.04	926.81	1,083.73	837.47

Households in very disadvantaged areas spent the largest proportion of their total household expenditure on 6 of the 9 commodity groups listed in Table 5.4.

Table 5.4: Proportion of average weekly household expenditure on 9 selected groups of commodities by level of deprivation or affluence in Ireland from 2015 to 2016 [69]

Commodity group	Households in very disadvantaged areas	Households in disadvantaged areas	Households in average-income areas	Households in affluent areas	Households in very affluent areas	Average for all households
Food	17.3	15.9	14.8	14.4	12.8	14.7
Alcoholic beverages and tobacco	4.8	3.2	3.1	3.3	2.9	3.3
Clothing and footwear	4.5	4.3	3.9	3.8	3.8	4.0
Fuel and light	5.9	5.2	4.9	4.4	3.5	4.6
Housing	18.5	17.1	17.7	19.3	23.6	19.6
Household non-durable goods	2.3	2.1	2.0	1.9	1.7	2.0
Household durable goods	3.7	3.5	3.4	3.3	2.8	3.3
Transport	14.5	16.2	16.6	15.6	12.3	14.9
Miscellaneous goods, services and other expenditure	28.5	32.6	33.6	34.0	36.5	33.6
Total expenditure	100.0	100.0	100.0	100.0	100.0	100.0

The proportion of average weekly expenditure on food and non-alcoholic beverages (excluding meals away from home and own garden produce) of lowest and highest gross household income deciles (the lowest 10.0 per cent and highest 10.0 per cent of income levels) in Ireland is shown in Table 5.5.

Table 5.5: Proportion of average weekly expenditure on food and non-alcoholic beverages of the lowest and highest gross household income deciles in Ireland from 2015 to 2016 [69]

Food or drinks category	First (lowest) gross household income decile – income below €252.21	Tenth (highest) gross household income decile – income below €2,163.17	Average for all households
Bread	6.2	4.9	6.8
Cakes, buns, pastries and biscuits	7.4	6.1	8.2
Milk, yoghurt and cheese	10.1	10.2	12.8
Uncooked meat and fish	23.1	22.1	31.9
Fresh fruit and vegetables	12.9	14.5	16.5
Sugars, confectionery and snacks	8.5	8.4	11.3
Takeaway	4.2	6.2	7.7
Soft drinks	3.3	3.6	4.8

As a proportion of total household expenditure, food purchases fell from 16.2 per cent to 14.7 per cent between 2009 to 2010 and 2015 to 2016 (Table 5.6). Spending on food has been falling steadily since 1980, when food represented the largest proportion of total household expenditure, at 27.7 per cent. However, by 2015 to 2016 this had fallen to 14.7 per cent.

Table 5.6: Change in expenditure on food and non-alcoholic drinks as a percentage of total household expenditure in Ireland between 1980 and 2015 to 2016 [48]

1980	1987	1994 to 1995	1999 to 2000	2004 to 2005	2009 to 2010	2015 to 2016
27.70	25.20	22.70	20.40	18.10	16.20	14.70

Average household spend on food differs by deprivation status (derived from the Pobal HP Deprivation Index). The average spend is €123.80, with the least affluent spending €101.28 – which is 37.21 per cent less than the most affluent quintile (€138.97) [48] (Table 5.7).

Table 5.7: Average weekly household expenditure on food and non-alcoholic drinks in euro (€) in Ireland according to the economic status of areas (Very disadvantaged – Very affluent) in Ireland in 2015 [48]

Households in very disadvantaged areas	Households in disadvantaged areas	Households in average-income areas	Households in affluent areas	Households in very affluent areas	Average for all households
101.28	116.96	125.30	133.28	138.97	123.28

According to the Household Budget Survey for 2015 to 2016, there are differences in expenditure patterns by levels of deprivation. In 2015 to 2016, households in very affluent areas spent 14.9 per cent of their food budget on fresh fruit and vegetables, compared with 11.2 per cent in households in very disadvantaged areas (Table 5.8).

The data indicate that lower-income households spend proportionately more on bread, soft drinks and confectionery and less on fruit, vegetables and meat than those in more affluent areas.

Table 5.7: Proportion of average weekly household expenditure on food and non-alcoholic drinks (excluding meals away from home and own garden produce) as a percentage of total household expenditure by category and level of deprivation or affluence in Ireland in 2015 to 2016 [48]

Food or drinks product category	Households in very disadvantaged areas	Households in disadvantaged areas	Households in average-income areas	Households in affluent areas	Households in very affluent areas
Bread	5.8	5.6	5.6	5.2	4.9
Cakes, buns, pastries and biscuits	6.3	6.8	6.7	6.5	6.2
Milk, yoghurt and cheese	9.5	10.4	10.2	10.2	10.2
Uncooked meat and fish	22.7	23.1	23.0	22.5	20.7
Fresh fruit and vegetables	11.2	12.8	12.9	13.4	14.9

Food or drinks product category	Households in very disadvantaged areas	Households in disadvantaged areas	Households in average-income areas	Households in affluent areas	Households in very affluent areas
Sugars, confectionery and snacks	9.5	8.1	8.7	9.0	8.6
Takeaway	8.1	4.8	5.3	5.8	6.8
Soft drinks	4.3	3.9	3.6	3.6	3.6

The equivalent detail is not available for Northern Ireland as there is no specific dataset that includes expenditure by income decile or quintile.

United Kingdom consumer expenditure on food and drinks in relation to household income

The ONS Living Costs and Food Survey is the most significant survey on household spending in the UK. It collects information annually on spending patterns and the cost of living that reflect household budgets. The 2019 survey found that the average weekly household spending in the UK was £585.60 for the year ending 2018 – a similar level to 2017 (£582.40) after adjusting for inflation.

The average UK household spends £61.90 per week on food and non-alcoholic beverages (equivalent to 10.6 per cent of income). Of this, £56.60 is spent on food and £5.50 is spent on non-alcoholic drinks (Table 5.9).

Table 5.9: Average weekly household expenditure on food by category in pounds sterling (£) in the United Kingdom for the year April 2018 to March 2019 [70]

Food category	Average weekly household expenditure in pounds sterling (£) in the United Kingdom in the year April 2018 to March 2019
Poultry (fresh, chilled or frozen)	2.30
Beef (fresh, chilled or frozen)	1.90
Bacon and ham	No data available
Fish and fish products	3.00
Other meats and meat preparations	6.60
Eggs	No data available
Milk	2.20

Food category	Average weekly household expenditure in pounds sterling (£) in the United Kingdom in the year April 2018 to March 2019
Butter	No data available
Cheese and curd	2.10
Other milk products	2.30
Chocolate	2.10
Bread, rice and cereals	5.50
Buns, cakes, biscuits and so on	3.90
Pastry (savoury)	No data available
Fresh vegetables	4.40
Other tubers and products of tuber vegetables	No data available
Other preserved or processed vegetables	No data available
Potatoes	No data available
Fresh fruit	4.10
Dried fruit and nuts	No data available
Other food products	2.70

Spending on food and housing make up 42.0 per cent of total expenditure for households at the bottom decile of the income distribution, compared with 26.0 per cent for those in the top 10.0 per cent. While total expenditure increased across the deciles, the increase in food expenditure was disproportionate when compared with disposable income (Table 5.10).

Table 5.10: Household expenditure on food and non-alcoholic drinks by income decile ranking in the United Kingdom for the year April 2018 to March 2019 [71]

Household income ranking in the United Kingdom	Expenditure on food and non-alcoholic drinks for April 2018 to March 2019	Total household expenditure for April 2018 to March 2019	Disposable household income for April 2018 to March 2019
Decile 1	54.1	27.9	9.5
Decile 2	64.9	30.5	16.0
Decile 3	66.7	35.7	20.0
Decile 4	71.2	41.0	23.1
Decile 5	80.8	49.9	27.4
Decile 6	84.7	55.4	32.8
Decile 7	83.7	59.8	37.4
Decile 8	90.3	67.7	45.6
Decile 9	91.2	73.8	56.7
Decile 10	100.0	100.0	100.0

Table 5.11 shows that spending on food accounted for 14.0 per cent of total household spending in the bottom decile compared to 7.4 per cent for the top decile.

Table 5.11: Proportion of household expenditure as a percentage by Classification of Individual Consumption by Purpose category and income decile in the United Kingdom for the year ending 2019 [71]

Household income ranking in the UK	Transport	Housing*	Recreation and culture	Food and non-alcoholic drinks	Household goods and services	Restaurants and hotels	Other Classification of Individual Consumption by Purpose expenditure**
Decile 1	10.8	28.3	9.8	14.0	6.5	6.9	23.5
Decile 2	10.5	27.2	10.9	15.4	5.4	6.8	23.8
Decile 3	11.7	25.8	10.7	13.6	6.1	7.9	24.2
Decile 4	13.2	24.1	10.1	12.5	7.0	7.2	25.9
Decile 5	12.7	21.0	13.5	11.8	6.2	8.8	26.1
Decile 6	14.5	20.5	13.1	11.1	7.6	8.5	24.6
Decile 7	14.9	20.8	14.1	10.2	6.6	8.9	24.5
Decile 8	14.2	21.7	14.1	9.9	6.6	9.5	24.1
Decile 9	15.5	18.5	15.8	8.9	6.8	9.5	25.5
Decile 10	14.4	18.6	13.5	7.4	8.5	9.9	27.7

* "Housing" in Table 4.3 includes housing (net), fuel and power, mortgage interest and Council Tax and excludes mortgage capital payments.

** "Other" Classification of Individual Consumption by Purpose expenditure includes alcoholic drinks, tobacco and narcotics, clothing and footwear, health, communication, education, miscellaneous goods and services and other expenditure items (minus mortgage interest, Council Tax and so on).

6 “Niche markets”

Introduction

Section 6 of the compendium provides a summary of available data relating to some “niche markets” – segments of the food and drinks market that are focussed on (for example) a particular consumer need, or a method of production, or lifestyle. Data are shown for free-from foods, organic foods, genetically modified organisms and clean label food.

“Free from” food and drinks products

Island of Ireland market for “free from” food and drinks products

“Free from” food and drinks are products that are manufactured and targeted specifically at consumers who suffer from food intolerances or allergies, or who are following avoidance diets for other reasons. Typically, this includes foods that are free from gluten, dairy, nuts or eggs [72].

Table 6.1 provides an overview of the most common foods that are avoided across the island of Ireland [73].

Table 6.1: Types of food or ingredients consumers (aged 16 and above) avoid as part of a generally healthy lifestyle reported by 650 internet users Northern Ireland and 1,350 internet users in Ireland in 2017 [73]

Types of food or ingredients avoided for healthy lifestyle reasons	Proportion of consumers avoiding this food or ingredient in Northern Ireland in 2017 as a percentage (%)	Proportion of consumers avoiding this food or ingredient in Ireland in 2017 as a percentage (%)
Soya	5	7
Lactose	4	7
Gluten	5	6
Dairy	4	6
Red meat (for example beef, lamb, pork)	4	6
Wheat	5	5
Fish or shellfish	4	4

Types of food or ingredients avoided for healthy lifestyle reasons	Proportion of consumers avoiding this food or ingredient in Northern Ireland in 2017 as a percentage (%)	Proportion of consumers avoiding this food or ingredient in Ireland in 2017 as a percentage (%)
Nuts	3	4
Celery	3	4
Eggs	2	2
Poultry	2	3
Other food or ingredients	2	4

Statistics show that approximately 5.0 per cent of children and 3.0 per cent of adults in Ireland suffer from food allergies. However, some studies suggest that 38.0 per cent of those who buy gluten-free products in Ireland do so as part of an overall healthy lifestyle rather than due to a specific allergy or intolerance [74].

Table 6.2 sets out data relating to food avoidance due to food allergies and intolerances.

Table 6.2: Types of food or ingredients consumers (aged 16 and above) avoid because they or a member of their household has a confirmed or suspected food allergy or intolerance, reported by 650 internet users in Northern Ireland and 1,350 internet users in Ireland in 2017 [74]

Types of food or ingredients avoided for allergy or intolerance reasons	Proportion of consumers avoiding this food or ingredient in Northern Ireland in 2017 as a percentage (%)	Proportion of consumers avoiding this food or ingredient in Ireland in 2017 as a percentage (%)
Gluten	8	11
Dairy	8	10
Wheat	8	9
Lactose	8	9
Nuts	4	7
Fish or shellfish	4	6
Eggs	3	3
Soya	2	3
Celery	2	2

Types of food or ingredients avoided for allergy or intolerance reasons	Proportion of consumers avoiding this food or ingredient in Northern Ireland in 2017 as a percentage (%)	Proportion of consumers avoiding this food or ingredient in Ireland in 2017 as a percentage (%)
Red meat (for example beef, lamb, pork)	1	2
Poultry	1	2
Other food or ingredients	2	4

A Bord Bia report (2017) [74] notes that the top 5 types of food that people avoid (Table 6.3) due to a confirmed or suspected food allergy or intolerance are

- Dairy
- Gluten or wheat
- Lactose
- Nuts
- Other food or ingredients, including soya

(Bord Bia is an Irish state agency that promotes sales of Irish food and horticulture in Ireland and abroad.)

Table 6.3: Key segments of the “free from” food market on the island of Ireland in 2017

Type of food product or ingredient	Key segments of the “free from” market on the island of Ireland in April 2017
“Free from dairy”	<ul style="list-style-type: none"> • “Dairy-free” is the most widely bought type of “free from” food or ingredient in Ireland and Northern Ireland, with 51.0 per cent of consumers having bought alternatives to dairy such as coconut milk alternatives or soya cheese alternatives in the last 6 months. • Ten per cent of consumers said they bought a dairy alternative due to a food allergy or intolerance in their household. • Six per cent said they bought a dairy-free product as part of a generally healthy lifestyle.
“Free from gluten” or “free from wheat”	<ul style="list-style-type: none"> • “Gluten-free” is a leading category in the “free from” market.

Type of food product or ingredient	Key segments of the “free from” market on the island of Ireland in April 2017
	<ul style="list-style-type: none"> • “Snacks” are the largest type of food claiming to have “low gluten”, “no gluten” or a reduced-gluten content. This has seen a trend rise in ingredients such as nuts, seeds and legumes, which are naturally low in gluten. • Pasta has seen its market shrink internationally in recent years, with consumers less eager to buy between 2011 and 2015. Gluten-free pasta has since been launched in Ireland and the UK (since 2017). • Wheat products are not marketed as “gluten-free” due to the presence of gluten in wheat. However, it is possible for people to have a specific allergy to wheat as opposed to coeliac disease or another intolerance to gluten. Consumers who are specifically intolerant to wheat are also known to eat some gluten-free foods. • A study from Bord Bia in 2017 [75] found that nearly 1 in 5 Irish shoppers regularly shop for gluten-free products even though they have not been diagnosed as coeliac. • Some 38.0 per cent of these say that do not have an intolerance to wheat at all but perceive “gluten-free” foods to be a healthier lifestyle choice.
“Free from lactose”	<ul style="list-style-type: none"> • Lactose intolerance is a digestive problem caused by an inability to digest lactose, a sugar found in milk and dairy products. “Lactose-free” food products do not necessarily mean they are “dairy-free”, as lactose is often removed from milk-based products. • Nine per cent of consumers reported avoiding lactose due to a food allergy or intolerance in their household • Seven per cent of consumers avoid lactose as part of a generally healthy lifestyle.

Type of food product or ingredient	Key segments of the “free from” market on the island of Ireland in April 2017
“Free from nuts”	<ul style="list-style-type: none"> • Seven per cent of Irish consumers avoid nuts due to a food allergy or intolerance in their household. • Four per cent tend to avoid nuts as part of a generally healthy lifestyle.
“Free from” other food ingredients, including soya	<ul style="list-style-type: none"> • Soya is the food type most avoided by Irish consumers as part of a general healthy lifestyle, with 7.0 per cent of consumers saying they avoid this ingredient. • Of these, just 3.0 per cent avoid soya due to a food allergy or intolerance in their household.

Ireland market for “free from” food and drinks products

Whilst annual data relating to the “free from” food and drinks market in Ireland was not available at the time the compendium was being compiled, there are data to show that the market is growing.

- In 2017, Kantar® reported that the “gluten-free” market in Ireland was estimated to be worth €66 million, a 36.0 per cent increase from 2016 [78].
- Recent research conducted by Bord Bia also found that 1 in 5 consumers in Ireland now buys gluten-free food regularly [75].

United Kingdom market for “free from” foods and drinks products

Data for the United Kingdom shows that the retail value of “free from” products is growing year on year.

- Statista® estimated that the market increased from £221 million in 2010 to £470 million in 2015 and is predicted to increase further, to £673 million, by the end of 2020 [76].
- Mintel® (Mintel Group, based in London) report that all major retailers have now added new products and upgrades to their “free from” ranges. They estimate that the UK “free from” food and drink retail market was worth £934 million in 2019, up from £438 million in 2016 (£261 million more than the Statista® predictions for 2020) [77].

- Mintel® also noted that the dairy-free and/or lactose-free market continued to outpace the gluten-free and/or wheat-free market in 2019, with sales estimated to reach £517 million and £416 million, respectively, by the end of the year [77].
- Although only 1.0 per cent of the UK population are estimated to be affected by coeliac disease, 55.0 per cent of the market is made up of non-sufferers. More than half the UK population is now buying “free from” food products [78]. It was estimated that, in 2015, the UK accounted for 7.0 per cent of global gluten-free bakery sales.

European Union and United States markets for “free from” food and drinks products

Whilst data on the “free from” food and drinks market across Europe and the US are also limited, they show that the market is growing and that “free from” foods are becoming mainstream “health food” products.

- In the EU, the “free from” food and drinks market is made up predominantly of “gluten-free” and “dairy-free” products as large numbers of people reduce their consumption of gluten and dairy.
- Although the “dairy-free” products market was once dominated by soya alternatives to milk, other nut-based and plant-based drinks have become consumers’ milk alternative of choice. A greater array of dairy-free products has also paved the way for more consumer choice and greater acceptance, with extremely high interest in new products such as non-dairy ice cream [79].
- The “gluten-free” products market is also increasingly accessible to the general consumer, with forecasts predicting a strong uptake in “gluten-free” purchases per person, particularly in the Nordic countries and the UK.
- “Free from” food and drinks sales are predicted to grow in Europe as more and more supermarkets launch their own private “free from” labels and food companies reformulate or recreate their products to become “free from” selected ingredients [80].
- Market research company Euromonitor® (Euromonitor International, based in London) estimated that, in 2017, “free from” sales in Western Europe and Eastern Europe were 11.7 per cent and 8.7 per cent of the food market, respectively [81].
- Statista® have also estimated that spending on “gluten-free” products per person in leading markets in Europe will increase between 2015 and 2020. By 2020, Finland was forecast to spend the most on “gluten-free” products, at \$34.5 per person, followed by Norway, at \$28.5 [82].

- There is no specific data relating to spend on all “free from” foods or spend per person in either the UK or Ireland.
- The “gluten-free” market in North America was valued at \$4.3 billion in 2019 and is estimated to reach \$7.5 billion by 2027 [83].

“Plant-based” food and drinks products

There are an estimated 628 million vegetarians in the world, over half of whom are in India [81].

There is no definitive data source on the number of people on the island of Ireland who follow a plant-based diet. However, the evidence suggests that plant-based diets (vegetarianism and veganism) are becoming more popular.

Island of Ireland market for “plant-based” food and drinks products

- In 2018, Bord Bia estimated that around 8.0 per cent of the population in Ireland were vegetarian and 3.5 per cent were vegan [84].
- In 2019, a Bord Bia survey found that 2.0 per cent of respondents had a meat-free substitute evening meal in the previous week and 1.0 per cent reported having a vegan meal during the previous week (Table 6.4) [85].

Table 6.4: Estimated rates of vegetarian and veganism on the island of Ireland as a percentage in 2019 [84] [86] [87]

Plant-based diet	Northern Ireland	Ireland
Vegetarian	3.5	8.0
Vegan	2.0	7.0

United Kingdom market for “plant-based” food and drinks products

- According to The Vegan Society, veganism in the UK quadrupled between 2014 and 2019 [88] (from 150,000 to 600,000 people).
- Whilst no specific data was found on the proportion of vegetarians or vegans in Northern Ireland, a survey published by Waitrose and Partners® supermarkets (2018) found that 13.0 per cent of the UK public identified themselves as vegetarian, with a further 21.0 per cent stating that they were flexitarian (or, occasional meat eaters) [89].
- Another survey found the rate of vegetarianism in the UK to be much lower, at 7.0 per cent, with 2.0 per cent of respondents reporting to be vegan [86].

- The increase in the proportion of the population who have identified themselves as vegan or vegetarian has also been mirrored in the demand for, and the range of, vegan and vegetarian foods that are available. For example, Ocado® grocery technology group reported that, in the UK, the sales of vegan foods increased by 1,678.0 per cent between 2015 and 2016 [90].
- Furthermore, 1 in 6 new food products (16.0 per cent) launched in the UK were vegan, compared with just 8.0 per cent in 2015 [91].

European Union and United States markets for “plant-based” food and drinks products

- There are no reliable statistics on the number of vegetarians and vegans in Europe [92]. However, data from Statista® suggests that, in 2016, around 5.0 per cent of Europeans considered themselves vegetarian or vegan [93].
- There also appears to be considerable variation in the rates of vegetarianism or veganism across Europe, at 6.4 per cent in Italy in 2019 [94], 1.9 per cent in France in 2017 [95], 10.0 per cent in the Netherlands in 2019 [96] and 5.3 per cent in Germany in 2016 [97].
- In 2018, Statista® estimated that 6.0 per cent of the population in the US were vegetarian, with both vegetarian and vegan diets becoming more popular. Whilst 2.5 per cent of Americans over the age of 50 consider themselves vegetarian, 7.5 per cent of “millennials” or “Generation Y” (people born between 1981 and 1996) and “Generation Z” (people born between 1997 and 2012) have given up consuming meat. The rate of veganism in the US is also double that for younger generations compared to older Americans [98].
- In 2012, a Gallup® poll (Gallup Incorporated, Washington D.C.) found that only 4.0 per cent of Americans considered themselves as always vegetarian and only 1.0 per cent vegan, whilst another poll in 2014 found that 2.0 per cent of Americans identified themselves as vegan [99] [100].
- Data relating to the sales of plant-based foods also show significant increases over the last few years. For example, about 1 in 10 new food products (9.0 per cent) launched in Europe in 2018 had a “vegan” or “no animal ingredients” claim, up from 5.0 per cent in 2015 [101].
- The Good Food Institute (a non-profit organisation promoting plant-based and cell-based alternatives to animal products) also shows that retail sales of plant-based foods increased by 29.0 per cent in the US between 2017 and 2019, from €3.9 billion to €5.0 billion [102].

- Milk alternatives are the highest-selling segment of plant-based foods, valued at €2 billion in 2019 [103].

“Organic” food and drinks products

Broadly, “organic” food is food that has been produced without the use of man-made fertilisers, pesticides, GMOs, growth regulators and livestock feed additives [104]. Standards for “organic” food are set out in European law and it must be fully traceable.

Northern Ireland and the United Kingdom markets for “organic” food and drinks products

- The “organic” food market in the UK continues to experience steady growth. According to the Soil Association (a charity that certifies “organic” food and campaigns for less intensive farming), sales of “organic” food and drinks increased by 2.5 per cent in 2019 to £2.54 billion [105]. That means almost £45.0 million per week is spent on “organic” food in the UK, accounting for around 1.5 per cent of all food and drink sales.
- Whilst data relating to “organic” food sales specifically in Northern Ireland is limited, the Soil Association reported that Northern Ireland-based Soil Association Certification licensees’ turnover increased by 22.0 per cent in 2018.
- By 2019, there were 220 “organic” food producers and processors in Northern Ireland, an increase of 7.8 per cent against 2016. While data are limited, indications are that the sale of organic food is increasing in Northern Ireland, as well as the number of “organic” food and drinks producers.

Ireland market for “organic” food and drinks products

- The proportion of land in Ireland that is farmed “organically” is still also relatively small, compared with the EU average of 7.50 per cent. The area under “organic farming” in Ireland is very small but has been steadily increasing over the past decade, doubling from 1.16 per cent of all Utilised Agricultural Area in 2014 to 2.63 per cent in 2018, as shown in Table 6.5. It is therefore comparable with the UK, where 2.64 per cent of Utilised Agricultural Area was “organic” in 2018 [106].
- There are currently 2,127 “organic” operators in Ireland, of which over 1,700 are farmers, with the remainder comprising processors, retailers, distributors and importers [107].

- A survey conducted for Bord Bia found that, in 2019, 26.00 per cent of people in Ireland bought “organic” food wherever possible [84]. However, spend on organic food per person was still quite low when compared with other EU countries.

Table 6.5: Proportion of Utilised Agricultural Area in Ireland that is “organic”, as a percentage, from 2014 to 2018 [106]

Year	Proportion of Utilised Agricultural Area in Ireland that is “organic”, as a percentage (%), from 2014 to 2018
2014	1.16
2015	1.65
2016	1.72
2017	1.66
2018	2.63

Worldwide market for “organic” food and drinks products

- The worldwide “organic” food and drinks products market is valued at between \$124.0 billion [107] and \$165.5 billion [108].
- All data sources have projected that the market will grow at a Compound Annual Growth Rate of 16.0 per cent, possibly reaching \$262.0 billion by 2022.
- The US accounted for 45.0 per cent of global “organic” food sales in 2018, at \$95.0 billion [109].
- The “organic” food market is also well established in Europe and in 2017 sales were in the region of €37.3 billion, an increase of around 5.4 per cent since 2015 [110].
- Germany had the greatest proportion of sales of “organic” foods in Europe, accounting for 8.0 per cent of global sales [110].
- Germany is the leading market for “organic” products in Europe, with an 11.4 per cent share of the European market “organic” sales, followed by France, with 7.3 per cent [110].

Table 6.6 provides an overview of expenditure per person on “organic” food for European countries in 2020

Table 6.6: Expenditure per person in euro (€) on “organic” food and drinks in European countries in 2020 [111]

European country	Expenditure per person in euro (€) on “organic” food and drinks in 2020
Denmark	312
France	136
Germany	132
Ireland	43
Italy	58
Netherlands	75
Norway	79
Portugal	2
Spain	42
Sweden	231
United Kingdom	38

- Whilst Germany spent more on “organic” food than other European countries overall, Denmark and Sweden spent the most per person, at €312 and €231, respectively.
- Expenditure on “organic” food in the UK and Ireland was amongst the lowest in Western Europe, at €38 and €43 per person, respectively.
- Data on total spend on “organic” food for all European countries were not available.

Table 6.7 sets out the data available for European countries, as well as for Australia, China, Japan, Canada and the US.

Table 6.7: Worldwide consumption of “organic” food and drinks products per person in euro (€) and value of retail sales in millions of euro by country in 2018 [111]

Country	Consumption of “organic” food and drinks per person in euro (€) in 2018	Retail sales of “organic” food and drinks per country in millions of euro (€) in 2018
<i>European countries</i>		
France	136.0	9,139.00
Germany	131.77	10,910.00
Ireland	43.14	206.40*
Italy	57.6	3,483.00
United Kingdom	38.28	2,536.98*
<i>Worldwide</i>		
Australia	48.59	1,223.65
Canada	84.11	3,118.60
China	5.54	8,087.37
Japan	11.15	1,418.71
United States	124.52	40,558.85*

“Clean label” food and drinks products

“Clean label” is an industry and consumer term for food and drinks products made with (preferably) natural ingredients and with no artificial ingredients or synthetic chemicals (that is, “natural” or “organic” ingredients and products) [112]. “Organic” foods are considered to be an element of the wider “clean label” food market.

Mintel® defined “clean label” foods as having 5 attributes [113]:

- No additives or preservatives
- GMO-free
- “Organic”
- Wholegrain
- All-natural products

Worldwide market for “clean label” food and drinks products

- The “clean label” market is difficult to define as many of the terms used in “clean label” foods are not recognised or defined by the EU. For example, the term “natural” is not protected under EU or UK law [114].
- Whilst there is very little information available on the size or value of the “clean label” market in Northern Ireland or Ireland, market intelligence shows that the “clean label” ingredients market globally was valued at \$38.8 billion in 2018, and is projected to reach \$64.1 billion by 2026, growing at a Compound Annual Growth Rate of 6.8 per cent from 2019 to 2026 [115].

Non-alcoholic drinks

The rate of consumption of soft drinks, including bottled water, soda (carbonated or “fizzy” drinks), “dilutables” (such as squashes, cordials, powdered concentrates) and juices, has seen a change in pace, as concerns over the amount of sugar added to beverages is leading consumers to select products that are lower in sugar.

Island of Ireland market for non-alcoholic drinks

Table 6.8 shows consumption of non-alcoholic drinks, or “soft drinks”, per person, per year, in the UK and Ireland between 2012 and 2017. “Soft drinks” include carbonated drinks, still drinks, iced and “ready-to-drink” tea and coffee drinks, “sports drinks”, “energy drinks”, flavoured water, “enhanced” water (water with added flavour, vitamins and minerals and so on), “packaged” water (bottled drinking water), squashes and syrups, fruit powders, juice, and “nectars” (containing 25.0 to 99.0 per cent juice).

- There is no Northern Ireland-specific data on soft drinks consumption; however, the UK consumes more soft drinks (15.0 per cent more) than Ireland, per person.
- Total soft drinks consumption per person in the UK decreased by 2.5 per cent between 2012 and 2017, while Ireland saw a 2.6 per cent increase in the same period.

Table 6.8: Consumption of non-alcoholic drinks (“soft drinks”) in litres per person, per year, in Ireland and in the United Kingdom from 2012 to 2017 [116]

Country	2012	2013	2014	2015	2016	2017
Ireland	165.5	166.0	167.2	167.2	168.1	170.0
United Kingdom	206.0	206.1	203.6	201.7	202.7	200.8

- In both the UK and Ireland, the sale of “packaged” water has seen the highest increase in consumption of all the soft drinks, and juices and “nectars” have seen the largest decrease (Tables 6.9 and 6.10). “Packaged water” consumption has increased by 30.0 per cent per person in the UK, from 26.6 litres to 38.2 litres per year, and by 36.0 per cent per person in Ireland, from 33 litres to 51.8 litres per year.
- The consumption of “dilutables” has decreased by 16.0 per cent in the UK and by 15.0 per cent in Ireland between 2012 and 2017.
- Juices and “nectar” drinks have also seen a decrease in consumption per head, by just under a quarter (23.0 per cent) in the UK and by a third (33.0 per cent) in Ireland.

Table 6.9: Consumption of selected types of non-alcoholic drinks (“soft drinks”) in litres per person per year in Ireland from 2012 to 2017 [116]

Year	All soft drinks	“Packaged” water	“Dilutables”	Juices and “nectars”
2017	85.2	51.8	25.2	11.6
2016	85.3	48.0	26.7	10.9
2015	86.0	44.8	27.5	9.6
2014	88.0	41.3	28.3	8.8
2013	89.6	35.9	29.7	8.1
2012	91.3	33.0	29.6	7.8

Table 6.10: Consumption of selected types of non-alcoholic drinks (“soft drinks”) in litres per person per year in the United Kingdom from 2012 to 2017 [116]

Year	All soft drinks	“Packaged” water	“Dilutables”	Juices and “nectars”
2017	104.4	38.2	41.9	16.3
2016	106.1	36.7	43.1	16.9
2015	106.4	33.6	44.3	17.5
2014	107.3	30.8	47.1	18.4
2013	108.7	28.0	49.5	19.9
2012	108.5	26.6	50.1	20.8

Across the island of Ireland, the overall consumption of sugary drinks has decreased over recent years. Both Northern Ireland and Ireland saw significant decreases in the daily consumption of sugary drinks in 2018, compared with the previous years (Table 6.11). The change in consumption patterns is likely a result of the Soft Drinks Industry Levy in the UK [117] and the Sugar Sweetened Drinks Tax in Ireland [118], as well as an increased awareness around the physiological harms of excessive sugar consumption.

Table 6.11: Daily consumption of sugary drinks in Northern Ireland and in Ireland as a percentage of total beverages consumption from 2015 to 2018 [119] [120]

Year	Consumption of sugary drinks as a percentage (%) of total beverages consumption in Northern Ireland	Consumption of sugary drinks as a percentage (%) of total beverages consumption in Ireland
2018	10	9
2017	Not available	16
2016	18	14
2015	19	15

- In addition to the extra taxes that have been placed on sugary drinks in both Northern Ireland and Ireland, data from *safe food* also suggest that consumers are increasingly concerned about sugar levels in drinks. As shown in Table 6.12, from 2013 to 2017, consumers have become 4 times more likely to identify sugar intake as their main issue of concern when selecting a beverage.

- The British Soft Drinks Association’s Annual Report (2019) identified that sugar intake from soft drinks in the UK has decreased by 30.4 per cent from 2015 to 2019 [121].

Table 6.12: Proportion of consumers across the island of Ireland reporting that sugar is a main concern when selecting food and beverages, as a percentage, from 2013 to 2017 [122]

Year	Northern Ireland	Ireland	Island of Ireland
2013	3	3	3
2014	1	6	5
2015	6	7	6
2016	8	7	7
2017	14	11	12

7 Price trends in major food groups

Introduction

Section 7 of the compendium sets out the data relating to trends in the price of some of the major food groups over the past 10 years and more for Ireland and the UK. Data specific to Northern Ireland prices are not available, so UK-wide data are provided.

The “major food groups” are considered to be [123]

- Bread, cereals and potatoes
- Fruit and vegetables
- Dairy (milk, cheese and yoghurt)
- Proteins (meat, poultry, fish and alternatives)
- Other foods (including fat spreads, oils, biscuits, cakes, chocolate, confectionery and savoury snacks)

There are a number of factors that influence the price of food, including supply and demand, inflation, currency exchange rates and the weather. Where possible, the Harmonised Indices of Consumer Prices have been presented, so that it is easy to compare price inflation for different countries.

The Consumer Price Index (CPI) measures overall changes in the price of frequently purchased consumer goods and services, including food. The CPI in Ireland collects data on around 53,000 prices each month.

Prices trends in major food groups in Ireland

Data from the CSO show that, on average, consumer prices were 0.9 per cent higher in 2019, compared with 2018, while prices of food and non-alcoholic beverages decreased by 0.8 per cent, as summarised in Table 7.1.

Table 7.1: Change in cost of goods and services as a percentage in Ireland from 2018 to 2019 [124]

Ireland Consumer Price Index category	Change in cost of goods and services as a percentage (%) in Ireland from 2018 to 2019
Food and non-alcoholic beverages	-0.8
Alcoholic beverages and tobacco	+3.1
Clothing and footwear	-1.7
Housing, water, electricity, gas and other fuels	+3.0
Furnishings, household equipment and routine household maintenance	-2.7
Health	+1.1
Transport	-0.4
Communications	-6.7
Recreation and culture	+1.3
Education	+1.7
Restaurants and hotels	+2.3
Miscellaneous goods and services	+1.3
All items	+0.9

As set out in Table 7.2, the cost of food in Ireland has generally been decreasing since 2013, while the cost of “soft drinks” increased from 2002 to 2012 but has gradually been decreasing since then. The cost of food decreased by around 11.3 per cent between 2013 and 2019 [124].

Table 7.2: Ireland Consumer Price Index for food and for soft drinks from 2009 to 2019 [124]

Year	Ireland Consumer Price Index levels for food in Ireland	Ireland Consumer Price Index levels for soft drinks in Ireland
2019	96.8	105.0
2018	96.8	107.9
2017	99.2	103.8
2016	101.9	107.4
2015	102.9	111.1
2014	105.4	113.4

Year	Ireland Consumer Price Index levels for food in Ireland	Ireland Consumer Price Index levels for soft drinks in Ireland
2013	108.1	112.9
2012	106.0	114.2
2011	105.5	109.0
2010	105.2	101.6
2009	111.1	105.6

Sugars, jams and confectionery has decreased the most in the period 2009 to 2019 (by 27.0 per cent), compared with non-alcoholic beverages, such as tea and coffee, which experienced a reduction of 8.7 per cent, as shown in Table 7.3.

Table 7.3: Ireland Consumer Price Index for selected food groups, and non-alcoholic beverages and soft drinks, from 2009 to 2020 [124]

Food or drinks category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Bread and cereals	113.6	107.0	110.3	107.7	109.2	106.8	103.9	101.5	98.2	96.4	96.2	95.8
Meat	114.2	107.6	105.9	106.4	109.3	106.8	104.2	101.9	100.0	96.7	96.6	96.4
Fish	104.0	100.2	99.6	100.6	102.7	102.8	97.6	98.1	96.1	93.6	93.6	93.7
Oils and fats	91.7	85.5	94.3	99.1	99.7	101.1	99.6	101.5	104.3	104.4	104.7	105.4
Fruit	110.4	104.8	106.8	106.1	104.0	102.0	99.6	100.2	98.7	99.1	99.5	97.8
Vegetables	111.5	105.2	101.4	103.4	110.8	102.3	98.5	101.6	98.5	95.2	97.0	94.3
Sugar, jam, honey, chocolate and confectionery	116.1	109.2	110.7	112.2	110.8	110.5	110.3	107.4	100.8	95.5	94.0	88.8
Non-alcoholic beverages	105.5	100.2	105.5	109.0	107.8	107.5	106.6	104.1	100.3	101.2	99.5	96.8
Soft drinks	105.6	101.6	109.0	114.2	112.9	113.4	111.1	107.4	103.8	107.9	105.0	104.4

Price trends in major food groups in the United Kingdom

United Kingdom Consumer Price Index data specific to Northern Ireland food prices are not available, so UK-wide data are provided. Table 7.4 sets out food price inflation rates for major food groups from the UK CPI.

Table 7.4: United Kingdom Consumer Price Index for selected food groups from 2009 to 2019 [125]

United Kingdom Consumer Price Index category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Meat	89.5	90.3	95.2	98.8	102.6	103.2	100.0	95.9	97.6	98.5	98.4
Bread and cereals	89.7	91.6	97.5	99.6	103.5	102.9	100.0	98.4	101.0	102.1	103.4
Poultry	130.9	130.9	138.4	139.8	145.2	144.6	136.2	127.5	125.3	124.5	121.6
Dairy	170.6	170.1	176.8	182.3	185.4	188.2	188.3	180.8	187.6	192.2	195.3
Vegetables	93.7	96.4	99.6	102.9	109.3	104.1	100.0	95.9	97.9	99.8	103.3
Fruit	168.2	181.6	188.6	193.1	208.5	209.4	209.8	211.9	218.3	225.2	224.8
Soft drinks	209.3	222.5	240.6	250.7	255.3	259.0	256.4	250.6	246.7	258.7	271.9
Total food and drinks	189.1	195.0	206.6	213.3	221.2	221.3	216.2	211.5	216.4	220.5	223.7

As shown in Table 6.4, overall food prices have increased over the past 10 years. The greatest inflation was in the price of “soft drinks”, from 209.0 per cent in 2009 to 271.0 per cent in 2019 (calculated from the base year of 1987). “Poultry” is the only food group identified in which there was a reduction during that period.

Data are available on the price of various foods to the consumers that provide a clearer indication of inflationary impacts on the cost of food. Table 7.5 gives an overview of the average price of selected individual foods over the past 10 years.

Table 7.5: Average cost in pence sterling (£) of selected food items in the United Kingdom, and overall change in cost as a percentage, from 2009 to 2019

[125]

Year	1 kilogram of Cheddar cheese	1 kilogram of beef	1 kilogram of bananas	1 kilogram of tomatoes	1 kilogram of apples	1 pint of milk
2009	749.8	1153	93	182	153	44.1
2010	779.3	1175	98	197	165	44.2
2011	780.1	1277	85	198	174	45.3
2012	788.8	1424	87	206	175	46.0
2013	777.8	1602	88	210	202	46.0
2014	801.6	1613	87	204	197	46.2
2015	766.6	1635	86	203	196	43.3
2016	718.8	1629	85	204	196	42.7
2017	718.2	1591	90	215	197	43.2
2018	727.7	1572	93	218	210	44.1
2019	708.7	1494	95	214	199	44.1
Change in cost as a percentage (%)	-6	+30	+1	+18	+30	0

Consumer food price inflation across Ireland, the United Kingdom, the European Union and the United States

Table 7.6 compares the Harmonised Indices of Consumer Prices from Ireland, the UK, the EU and the US from 2009 to 2019.

Table 7.6: Harmonised Indices of Consumer Prices for Ireland, the United Kingdom, the European Union and the United States from 2009 to 2019 [126]

Country	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Ireland	98.3	95.8	96.1	97.3	98.8	99.1	98.7	98.7	98.9	99.2	100.0
United Kingdom	84.9	87.8	91.3	94.6	97.1	99.0	99.3	99.5	101.4	104.4	106.3
European Union	89.5	91.0	93.4	96.1	98.2	99.0	98.6	98.8	100.5	102.1	103.6
United States	88.3	91.8	93.7	96.8	98.3	99.6	98.6	99.3	101.4	103.2	104.3

In 2009, food in Ireland was more expensive than the EU average or in the UK. By 2019, food in Ireland was less expensive, as inflation on food in the UK, EU and the US was much greater than in Ireland.

8 Environmental impacts and sustainability initiatives from the agrifood sector

Introduction

Section 8 of the compendium details key environmental statistics, including “greenhouse gas” (GHG) and ammonia emissions from the agricultural, or farming, sector and from food and drink manufacturing.

Sustainability in the agrifood sector, and the impacts and projections of various initiatives to reduce emissions, improve water and soil quality and maintain biodiversity, are also discussed, along with efforts to prepare for and mitigate the effects of climate change on the land and the marine environments.

“Greenhouse gas” emissions from agriculture and food production

“Greenhouse gases” absorb and emit radiant energy in the infrared range, trapping excessive heat in the Earth’s atmosphere and so contributing to climate change, an effect that has become known as “global warming”.

There are 3 main GHGs that are associated with agriculture and food production, each with different warming effects:

- Carbon dioxide (chemical formula CO_2), which has the weakest effect among the GHGs
- Methane (chemical formula CH_4), which has a strong effect
- Nitrous oxide (chemical formula N_2O), which has a very strong effect.

While carbon dioxide is not as potent as either methane or nitrous oxide, it has a significant impact on the environment because it is released in large amounts [127].

Globally, food systems account for more than a third of GHG emissions [128]. Within the agrifood industry worldwide, livestock are the biggest contributor to GHG emissions at 7.1 gigatonnes of carbon dioxide equivalents (CO_2e) per year, accounting for 14.5 per cent of human-caused emissions [129]. (“Carbon dioxide equivalent” is a unit or metric that is used to compare the global warming effect of different gases relative to that of carbon dioxide.)

Depending on the individual livestock species and location, their contribution to GHG emissions will vary. Foods with the highest GHG impacts generally come from ruminant meat (meat from animals that chew cud and digest it in several stomach compartments, such as beef from cattle), followed by other meats and animal products (such as eggs and dairy produce). Foods that typically have the lowest environmental impacts per kilogram of food produced are those derived from plants [129].

“Greenhouse gas” emissions from agriculture on the island of Ireland

The agrifood sector is an integral component of the economies across the island of Ireland, with agriculture and food production playing a key role in everyday life.

“Greenhouse gas” emissions from the agricultural sector (livestock, fertilisers and agricultural machinery) have been rising in recent years, with 34.0 per cent of GHG in Ireland in 2018 attributable to the sector [130]. In 2017, Ireland was reported to have the third-highest overall emissions of GHGs per person in the EU that year [131]. In 2018, emissions from agriculture exceeded GHG emissions from any other sector [132].

In recent years, GHG emissions have been rising, driven by larger numbers of dairy cows and increases in milk production [133]. Ireland is currently projected to miss its emission targets set out under EU legislation, despite existing measures that have already been adopted to reduce GHG emissions [134].

In 2017, GHGs from agriculture made up 27.0 per cent of total GHG emissions in Northern Ireland, the largest proportion of all the sectors. The proportion of the main greenhouse gases is shown in Table 8.1 [135].

Table 8.1: Proportion of 3 main “greenhouse gases” as a percentage (%) of total of “greenhouse gas” emissions associated with agriculture in Northern Ireland in 2017 [136]

“Greenhouse gas”	Proportion of “greenhouse gas” emissions as a percentage (%) in Northern Ireland in 2017
Methane (CH ₄)	65
Nitrous oxide (N ₂ O)	26
Carbon dioxide (CO ₂)	9

Table 8.2 shows agricultural GHG emissions from Northern Ireland and from Ireland for the period 2012 to 2017.

Table 8.2: “Greenhouse gas” emissions from agriculture in kilotonnes of carbon dioxide per year across the island of Ireland from 2012 to 2017 [134] [137]

Jurisdiction	2012	2013	2014	2015	2016	2017
Northern Ireland	5,106	5,118	5,134	5,211	5,321	5,385
Ireland	10,379	10,533	10,656	10,880	11,212	11,538

Nitrous oxide and methane are more potent GHGs than carbon dioxide. In 2018, the agriculture sector dominated emissions of nitrous oxide in the UK (including Northern Ireland). Emissions from agricultural soils accounted for 55.0 per cent of total UK nitrous oxide emissions, while manure management accounted for another 13.5 per cent [137].

Due to the nature of the agrifood sector, complex animal microbial processes and natural soil processes, it can be more difficult to measure nitrous oxide and methane emissions, compared with measuring carbon dioxide. Nitrous oxide is produced both naturally by soil and from fertilisers. Methane is produced as a result of digestive processes of livestock (enteric fermentation) and the management of manure and it is 25 times more powerful as a GHG than carbon dioxide [132,138]. Across the island of Ireland, as of 2018, enteric fermentation was the largest source of GHG emissions, while agricultural soils and manure were the second- and third-largest sources, respectively (Tables 8.3, 8.4 and 8.5).

Table 8.3: Proportion of “greenhouse gas” emissions from agriculture by source as a percentage of total emissions from agriculture in Ireland in 2018 [132]

Source of “greenhouse gas” emissions from agriculture	Proportion of “greenhouse gas” emissions as a percentage (%) of total emissions from agriculture in Ireland in 2018
Enteric fermentation (all ruminant animals)	56
Soils	29
Agriculture and forestry fuel combustion	3
Manure	10
Liming	2
Urea application	Less than 1

Table 8.4: Proportion of “greenhouse gas” emissions from agriculture by source as a percentage of total “greenhouse gas” emissions from agriculture in Northern Ireland in 2018 [139]

Source of “greenhouse gas” emissions from agriculture	Proportion of “greenhouse gas” emissions as a percentage (%) of total “greenhouse gas” emissions from agriculture in Northern Ireland in 2018
Enteric fermentation (cattle)	52
Soil	22
Manure	10
Off-road vehicles and equipment	8
Enteric fermentation (sheep)	4
Other source	3

Table 8.5: “Greenhouse gas” emissions from agriculture by source in kilotonnes per year in Ireland from 2013 to 2018 [132]

Source of “greenhouse gas” emissions from agriculture	2013	2014	2015	2016	2017	2018
Agriculture and forestry fuel combustion	674.28	608.58	580.05	600.49	631.14	680.35
Urea application	21.66	25.09	28.31	35.8	35.04	38.13
Liming	515.69	391.07	401.15	433.6	332.75	457.45
Agricultural soils	5,566.32	5,939.46	5,379.63	5,439.69	5,711.62	5,907.36
Manure management	1,832.21	1,840.2	1,872.41	1,936.82	1,972.42	1,970.84
Enteric fermentation	10,532.74	10,655.91	10,880.29	11,212.11	11,537.81	11,543.21

Trends in “greenhouse gas” emissions from agriculture in Europe

The trends in GHG emissions from agriculture have been estimated under the United Nations Framework Convention on Climate Change, the Kyoto Protocol and the EU Decision 525/2013/EC [140].

Trend data for the period 2013 to 2018 are presented in Table 8.6. Data between 2007 and 2018 can be accessed through the source link.

Table 8.6: “Greenhouse gas” emissions from agriculture in the European Union and European Economic Area countries as a percentage of the country’s overall “greenhouse gas” emissions, from 2013 to 2020 [141]

Region	2013	2014	2015	2016	2017	2018
European Union (28 countries)	9.3	9.8	9.8	9.8	9.8	9.9
Albania	Not available	Not available	Not available	Not available	Not available	Not available
Austria	8.7	9.2	9.0	9.0	8.7	8.9
Belgium	7.9	8.5	8.2	8.1	8.2	8.1
Bulgaria	10.2	10.5	10.0	11.0	10.5	10.9
Croatia	11.0	11.0	11.1	10.9	11.0	11.2
Cyprus	5.3	4.9	5.0	5.0	5.0	5.1
Czechia	6.1	6.3	6.6	6.7	6.7	6.7
Denmark	18.8	20.4	21.3	20.7	21.7	21.5
Estonia	6.4	6.8	7.9	7.1	6.8	7.1
Finland	10.1	10.9	11.5	11.1	11.5	11.2
France	15.0	16.4	16.2	15.9	15.8	16.2
Germany	6.8	7.3	7.3	7.1	7.2	7.2
Greece	8.0	7.8	8.0	8.3	8.0	8.1
Hungary	11.0	11.3	11.1	11.5	11.0	11.2
Iceland	12.0	12.7	12.0	11.7	11.1	10.3
Ireland	31.0	30.8	30.0	29.8	30.6	31.1
Italy	6.7	6.9	6.7	6.9	6.9	6.9
Latvia	22.0	22.9	23.2	23.2	23.1	21.4
Liechtenstein	10.2	12.0	12.0	12.6	12.0	13.0
Lithuania	21.0	22.1	22.1	21.4	21.0	20.7
Luxembourg	5.2	5.5	5.8	6.0	5.8	5.6

Region	2013	2014	2015	2016	2017	2018
Malta	2.1	2.0	2.6	2.9	2.5	2.5
Montenegro	Not available	Not available	Not available	Not available	Not available	Not available
Netherlands	8.7	9.1	9.0	9.1	9.2	9.1
North Macedonia	Not available	Not available	Not available	Not available	Not available	Not available
Norway	7.8	7.9	8.0	8.2	8.4	8.3
Poland	7.8	8.1	7.8	7.8	7.8	8.0
Portugal	9.7	9.9	9.3	9.6	9.1	9.5
Romania	16.1	16.1	16.4	16.7	16.3	17.0
Serbia	Not available	Not available	Not available	Not available	Not available	Not available
Slovakia	6.2	6.8	6.4	6.5	6.1	6.3
Slovenia	9.0	10.2	10.3	9.9	9.9	9.8
Spain	10.7	11.1	10.9	11.3	11.2	11.3
Sweden	11.8	12.3	12.3	12.3	12.7	12.4
Switzerland	10.6	11.5	11.5	11.3	11.5	11.5
Turkey	12.4	11.9	11.5	11.5	11.7	12.2
United Kingdom	6.7	7.4	7.5	7.9	8.1	8.2

Ammonia emissions from agriculture

Ammonia (chemical formula NH_3) is closely linked to agricultural GHG emissions through various farming activities. While ammonia is not in itself classified as a “greenhouse gas”, ammonia emissions are considered to be an indirect contributor to GHG emissions [138]. Ammonia has been identified as a key air pollutant that can have significant effects on human health and the environment [141].

Ammonia emissions from agriculture in Northern Ireland

In 2013, Northern Ireland’s ammonia emissions per person were more than 4 times the UK average [142]. This has been attributed to Northern Ireland’s agriculture sector, which accounts for a greater proportion of the Northern Ireland economy when compared with the rest of the UK. In 2016, agriculture contributed to 94.0 per cent of total ammonia emissions in Northern Ireland [143]. Increased emissions from the agriculture sector, in the form of application of waste (faeces, or manure, and urine) from cattle to soils, have resulted in higher ammonia emissions in recent years.

Table 8.7 provides a summary of ammonia emissions estimates for Northern Ireland from 2012 to 2016 by category of industry. Estimates from 1990 to 2016, and other air pollutant emissions estimates, can be accessed through the source link [Error! Bookmark not defined.].

Table 8.7: Summary of ammonia emissions estimates for Northern Ireland in kilotonnes per year from 2012 to 2016 [142]

Category of industry	2012	2013	2014	2015	2016
Agriculture	27.2	27.7	27.7	28.6	29.9
Transport	0.3	0.3	0.2	0.2	0.2
Industrial processes	0.0	0.0	0.0	0.0	0.0
Waste	0.6	0.8	0.8	0.9	1.0
Other areas of industry	0.6	0.7	0.7	0.7	0.7
Total emissions	28.7	29.4	29.4	30.4	31.8

As summarised in the Table 8.8, different agricultural activities have different levels of ammonia emissions. Cattle manure management and manure applied to soil accounted for the majority of emissions from agriculture in Northern Ireland (73.0 per cent) in 2016.

Table 8.8: Summary of ammonia emissions from agriculture by source as a proportion of total ammonia emissions from agriculture in Northern Ireland in 2016 [Error! Bookmark not defined.]

Source of ammonia emissions from agriculture in Northern Ireland	Proportion of total ammonia emissions from agriculture in Northern Ireland in 2016 as a percentage (%)
Cattle manure management	40
Manure applied to soils	33

Other manure management	11
Grazing animal excreta (faeces, or dung, and urine)	8
Inorganic fertilisers	7

Ammonia emissions from agriculture in Ireland

In Ireland, the agriculture sector accounts for virtually all (99.1 per cent) ammonia emissions [134]. In 2018, manure management, manure applied to soil and nitrogen from urine and dung deposition by grazing animals accounted for 88.6 per cent of national ammonia emissions (Table 8.9).

Of all livestock, both dairy and non-dairy cattle were responsible for significant ammonia emissions from the Irish agriculture sector in 2018, at 38.2 per cent (Table 8.10). Since 1990, which has been established as a “base” measure, ammonia emissions have increased by 7.9 per cent from 109.8 kilotonnes to 119.3 kilotonnes in 2018 [142].

Table 8.9: Ammonia emissions from agriculture by source other than livestock in kilotonnes per year in Ireland from 2012 to 2017 [144]

Source of ammonia emissions from agriculture (other than livestock) in Ireland	2012	2013	2014	2015	2016	2017
Inorganic nitrogen fertilisers (including urea application)	7.842	8.692	9.029	9.650	11.192	11.412
Animal manure applied to soils	31.891	32.237	32.335	33.146	34.576	35.318
Sewage sludge applied to soils	0.444	0.338	0.276	0.304	0.295	0.302
Urine and dung deposited by grazing animals	13.427	13.634	13.688	13.702	14.141	14.531

Table 8.10: Ammonia emissions from livestock in kilotonnes per year in Ireland from 2012 to 2017 [144]

Source of ammonia emissions from livestock in Ireland	2012	2013	2014	2015	2016	2017
Dairy cattle (manure management)	10.967	11.201	11.683	12.707	13.439	14.096
Non-dairy cattle (manure management)	30.043	30.486	29.913	29.862	31.023	31.299
Sheep (manure management)	1.165	1.157	1.141	1.128	1.129	1.193

Swine (manure management)	4.643	4.531	4.602	4.542	4.719	4.830
Goats (manure management)	0.020	0.017	0.017	0.021	0.019	0.016
Horses (manure management)	0.949	0.868	0.811	0.795	0.788	0.725
Laying hens (manure management)	0.659	0.717	0.740	0.829	0.841	0.880
Broilers (manure management)	1.397	1.306	1.471	1.482	1.494	1.494
Turkeys (manure management)	0.807	0.743	0.785	0.813	0.841	0.841
Other poultry (manure management)	0.082	0.080	0.085	0.090	0.096	0.096
Other animals (manure management)	0.287	0.286	0.287	0.285	0.286	0.286

Ammonia emissions from agriculture across the island of Ireland

The total ammonia emissions from agriculture on the island of Ireland for the period 2012 to 2016 is shown in Table 8.11.

Table 8.11: Total ammonia emissions from agriculture in kilotonnes per year on the island of Ireland from 2012 to 2016 [142,144]

Jurisdiction	2012	2013	2014	2015	2016
Ireland	104.68	106.34	106.91	109.41	114.93
Total emissions on the island of Ireland	131.88	134.04	134.61	138.01	144.83

“Greenhouse gas” emissions from dairy milk production

The production of dairy milk is a significant contributor to GHG emissions from the agrifood sector [Error! Bookmark not defined.].

The data are presented here in terms of grams of carbon dioxide equivalent per kilogram of energy-corrected milk, excluding sequestration.

Energy-corrected milk” determines the amount of energy in the milk based on the milk, fat and protein content, and is adjusted to 3.5 per cent fat and 3.2 per cent protein.

Sequestration” refers to the process by which carbon dioxide is removed from the atmosphere and held in solid or liquid form. Within agriculture, plants and soil sequester carbon as part of a natural process.

“Greenhouse gas” emissions from dairy milk production in Northern Ireland

Despite the expansion of the dairy sector over the years, GHG emissions related to milk production in Northern Ireland decreased to 1,272 grams of carbon dioxide equivalents per kilogram of energy-corrected milk in 2017, compared with a population average of 1,927 grams of carbon dioxide equivalents per kilogram of energy-corrected milk in 1990. This longer-term trend shows a 34.0 per cent decrease in emissions intensity of milk production between 1990 and 2017. Improvements in carbon footprint in the Northern Irish dairy sector are reported to be driven by increases in milk yield per cow [Error! Bookmark not defined.]. (“Carbon footprints” refer to GHG emissions per unit of product).

Table 8.12 details emissions intensity of milk production in Northern Ireland over the last 5 years of available data and Table 8.13 details the historic data since 1990.

Table 8.12: “Greenhouse gas” emissions intensity of dairy milk production in Northern Ireland in grams of carbon dioxide equivalent per kilogram of energy-corrected milk (excluding sequestration) from 2013 to 2017 [145]

2013	2014	2015	2016	2017
1,384	1,336	1,291	1,285	1,272

Table 8.13: “Greenhouse gas” emissions intensity of dairy milk production in Northern Ireland in grams of carbon dioxide equivalents per kilogram of energy-corrected milk (excluding sequestration) from 1990 to 2017 [145]

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Grams of CO ₂ equivalents per kilogram of energy-corrected milk	1,927	1,891	1,916	1,917	1,925	1,910	1,925	1776	1,752	1,794
Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Grams of CO ₂ equivalents per kilogram of energy-corrected milk	1,723	1,649	1,636	1,669	1,623	1,551	1,459	1,363	1,354	1,371
Year	2010	2011	2012	2013	2014	2015	2016	2017		
Grams of CO ₂ equivalents per kilogram of energy-corrected milk	1,349	1,280	1,294	1,384	1,336	1,291	1,285	1,272		

“Greenhouse gas” emissions from dairy milk production in Ireland

Between 2013 and 2018 in Ireland, an increase in dairy cows (27.0 per cent) and a subsequent increase in milk production (40.0 per cent) has contributed to increased GHG emissions.

Data that estimates the emissions intensity of milk production on farms in Ireland are currently not available.

“Greenhouse gas” emissions from food and drinks manufacturing

Trends in “greenhouse gas” emissions from food and drink manufacturing in the Ireland

Overall emissions from the combustion of fuels (measured as carbon dioxide equivalents) within the manufacturing industry in Ireland have increased year on year since 2011, following a decline after 2008 (Tables 8.14 and 8.15). Emissions from food and drink processing increased by 0.9 per cent in 2018 [146] (Table 8.16).

Similar data on food and beverage manufacturing emissions are not available for Northern Ireland or the UK.

Table 8.14: Manufacturing and combustion emissions (kilotonnes of carbon dioxide equivalents) by type of industry in Ireland from 1990 to 2019 [146]

Type of industry	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Other industries	826.43	1,038.06	963.14	1,001.67	1,075.03	1,103.39	1,017.50	1,143.35	1,142.60	1,165.74
Non-metallic minerals	822.78	844.13	550.89	612.97	440.42	488.31	547.09	538.19	493.71	479.15
Food processing, beverages and tobacco	1,021.40	1,087.97	998.71	1,063.41	1,119.49	1,135.01	1,105.00	1,219.89	1,242.49	1,278.52
Pulp, paper and print	28.53	28.46	34.66	42.22	51.20	57.62	61.07	69.67	78.73	83.44
Chemicals	411.36	342.96	334.56	346.00	359.56	34.49	323.33	330.18	328.91	375.93
Non-ferrous metals	811.46	825.66	961.99	986.60	1,247.73	1,183.73	1,125.66	1,221.41	1,219.13	1,293.02
Iron and steel	175.88	18.73	18.73	18.73	18.73	18.73	18.75	18.76	18.78	18.80
Type of industry	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Other industries	1,339.48	1,504.51	1,241.33	1,100.89	924.51	1,006.74	881.19	979.36	924.10	535.48
Non-metallic minerals	692.68	630.53	883.70	1330.22	1,705.13	1,777.15	1,661.67	1,691.14	1,524.02	987.12

Food processing, beverages and tobacco	1,525.95	1,530.97	1,279.43	1,127.52	939.43	1,066.14	905.70	812.14	802.72	928.09
Pulp, paper and print	96.07	95.20	83.67	77.02	69.21	37.30	23.05	8.77	16.61	16.11
Chemicals	459.51	474.86	438.24	419.88	412.46	447.79	353.78	312.08	321.82	365.42
Non-ferrous metals	1,347.29	1,189.81	1,162.46	1,163.83	1,239.39	1,134.32	1,433.10	1,542.79	1,566.60	1,300.77
Iron and steel	18.81	18.82	18.81	2.38	2.38	2.38	2.38	2.39	2.38	2.39
Type of industry	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Other industries	492.64	435.74	418.66	473.62	547.36	490.88	537.20	553.78	597.35	615.82
Non-metallic minerals	777.88	692.17	783.67	797.13	1044.92	1,114.81	1,154.70	1,147.87	1,212.62	1,166.86
Food processing, beverages and tobacco	920.91	818.54	914.81	940.37	911.31	948.67	988.86	1,036.08	1,068.74	983.70
Pulp, paper and print	13.94	9.74	13.28	11.89	10.85	10.12	11.97	12.51	13.29	13.47
Chemicals	387.28	376.19	391.06	358.05	365.46	381.83	385.99	394.82	416.97	425.43
Non-ferrous metals	1,569.44	1,355.11	1,233.26	1,337.22	1,296.85	1,312.43	1,271.20	1,314.39	1,373.62	1,381.58
Iron and steel	2.39	2.39	2.38	2.35	2.38	2.39	2.34	2.34	2.34	2.35

Table 8.15: Projections (as of July 2020) for manufacturing and combustion emissions (kilotonnes of carbon dioxide equivalents) by type of industry in Ireland from 1990 to 2019 [146]

Scenarios	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
With existing measures	5,628.12	5,674.25	5,709.34	5,694.88	5,714.05	5,743.31	5,806.76	5,872.31	5,939.99	6,013.19	6,084.98
With additional measures	5,481.89	5,454.90	5,382.31	5,284.40	5,214.56	5,148.23	5,121.77	5,099.51	5,079.66	5,065.86	5,050.41

Table 8.16: Manufacturing and combustion emissions from food processing, beverages and tobacco in kilotonnes of carbon dioxide equivalent per year in Ireland from 2014 to 2018 [146]

2014	2015	2016	2017	2018
800.69	859.6	860.9	869.14	899.82

Table 8.17 shows data relating to emissions of non-methane volatile organic compounds (NMVOC) from food and drink manufacturing in Ireland. Emissions of NMVOCs in Ireland have decreased by 22.0 per cent since 1990, with the production of food and beverages accounting for 23.0 per cent of emissions. (Agriculture is the largest source, at 41.0 per cent [134].)

Table 8.17: Non-methane volatile organic compounds emissions from food and beverage industrial processes, in kilograms of non-methane volatile organic compounds per tonne of food or per hectolitre of beverage material, in Ireland from 2014 to 2018 [134]

Source of non-methane volatile organic compound emissions from food and beverage industrial processes in Ireland	Unit of measurement	2014	2015	2016	2017	2018
Bread baking	kilograms per ton	4.5	4.5	4.5	4.5	4.5
Baking goods	kilograms per ton	1.0	1.0	1.0	1.0	1.0
Production of beer	kilograms per hectolitre	0.035	0.035	0.035	0.035	0.035
Production of spirits	kilograms per hectolitre	15.0	15.0	15.0	15.0	15.0
Meat, fish and so on curing or frying	kilograms per ton	0.33	0.33	0.33	0.33	0.33

Emissions of NMVOCs from food manufacturing include all processes that occur in the food chain after the slaughtering of animals and harvesting of crops, while emissions from drinks manufacturing include alcoholic beverages production (wine, beer and spirits) [Error! Bookmark not defined.] (Table 8.18).

Table 8.18: Total emissions of non-methane volatile organic compounds in kilotonnes in the food and beverages industry in the Ireland from 2013 to 2017 [134]

Year	2013	2014	2015	2016	2017
Non-methane volatile organic compounds in kilotonnes	22.492	19.031	20.041	21.241	26.574

For Ireland, emissions from the following manufacturing processes (as outlined by the European Monitoring and Evaluation Programme and European Environment Agency’s “Air Pollutant Emission Inventory Guidebook” (2019) are not occurring [147]: wine production; sugar production (last occurring in 2005); flour production (which does not occur on a large scale); and margarine and fats production.

As well as feedstocks, the following subcategories of the agrifood sector hold emission estimates for Ireland:

- Bread
- Beer
- Spirits
- Meat, fish and so on (frying or curing)
- Coffee roasting

The most significant sources of emissions in the food and beverage industry in Ireland are spirit production, bread production and animal feed production.

Impacts of sustainability initiatives

Northern Ireland sustainability initiatives

“Decarbonisation” – that is, reducing or removing carbon dioxide emissions – in Northern Ireland comes with a unique set of challenges, due to the country’s economic and political circumstances [148]. Decarbonising the power sector involves reducing emissions per unit of electricity generated. This is achieved through increasing the share of low-carbon energy sources such as “renewables” (for example, replacing fossil fuels with wind or solar power). Unlike the rest of the devolved administrations that make up the UK, Northern Ireland has been a member of an Integrated Single Electricity Market shared with Ireland since 2018 [149], meaning that energy policy must consider the efficiency of an all-island market.

A further challenge for decarbonisation in Northern Ireland is the proportionate contribution of GHG from the agriculture sector, compared with the rest of the UK (30.0 per cent in Northern Ireland, compared with 10.0 per cent in the UK). As the Northern Irish economy relies heavily on the agrifood sector, and farming in Northern Ireland is more heavily livestock-based compared with the rest of the UK, reducing carbon emissions from agriculture to meet EU and global climate change commitments will be even more challenging.

Efficient Farming Cuts Greenhouse Gases Implementation Plan 2016–2020

The Efficient Farming Cuts Greenhouse Gases Implementation Plan 2016–2020 builds on the existing efforts being made by the agrifood and forestry sector in Northern Ireland to minimise emissions per unit output (“carbon intensity”) of the agricultural sector [134]. The strategy has been devised by the Greenhouse Gas Implementation Partnership, which is a voluntary partnership formed in 2009 between environmental organisations, the agrifood sector, science and government. The earlier emissions reduction plan (the Greenhouse Gas

Reduction Strategy and Action Plan 2011) marked the initial action taken towards more sustainable agriculture.

Four key implementation themes were identified in order to move towards more efficient and sustainable farming:

- Better nutrient management
- Better land management (locking in carbon)
- Better livestock management
- Energy efficiency and renewable energy

A number of key achievements have been identified as a result of the GHG Reduction Strategy and Action Plan 2011.

Detailed advice on key actions (specific carbon efficiency measures) that farmers, growers and landowners can take to implement the 4 key themes can be found in the Efficient Farming Cuts Greenhouse Gases Implementation Plan 2016–2022.

The Efficient Farming Cuts Greenhouse Gases Implementation Plan 2016–2020 presents 7 case studies that outline the benefits and challenges of farm-specific carbon reduction strategies and which have been implemented as part of the support provided to farmers and landowners to reduce carbon intensity.

Climate Change Committee – Reducing Emissions in Northern Ireland

Under the Paris Agreement (2016), Northern Ireland must meet the UK's legislated emissions reductions targets. The Climate Change Committee (CCC) (an independent public body formed to advise the UK and its devolved administrations on dealing with and preparing for climate change) have estimated that Northern Ireland's contribution to the UK's Fifth Carbon Budget requires a minimum of 35.0 per cent reduction in emissions against 1990 levels by 2030 [148].

The CCC produced a report specific to Northern Irish emissions in response to advice requested by the Department for Agriculture, Environment and Rural Affairs in Northern Ireland (DAERA). The report proposes actions that can be taken across broad sectors of the Northern Irish economy and highlights Northern Ireland's individual characteristics, which separate it from the rest of the devolved nations when considering the country's contribution to UK-wide decarbonisation. Additionally, the report outlines a number of policy options to decarbonise agriculture and land use, land-use change and forestry (LULUCF).

Under DAERA’s 2013 “Going for Growth” strategy, targets have been set out to increase growth and productivity of the agrifood sector (including farming and food processing) [150]. While the strategy is primarily focussed on growth, it highlights some sustainability measures. If the strategy is successful, increased outputs from the agricultural sector will add pressure to the existing challenge of reducing overall carbon emissions from the sector.

Northern Ireland has significantly lower forest coverage than the UK as a whole (8.0 per cent, compared with 13.0 per cent), highlighting the importance of “afforestation” (that is, planting trees on land where there was no tree cover) in the context of sustainability efforts. A forestry grant scheme run by DAERA is in place to increase tree coverage from 6.0 per cent in 2006 to 12.0 per cent in 2056. Tree-planting rates in the last 5 years have fallen, which has been attributed to the period between the closing of one Rural Development Programme period (2006–2013) and the opening of the next (2014–2020).

The CCC have recommended that, in order to meet the UK’s legislated emissions reductions targets, Northern Ireland must meet an afforestation target of 900 hectares per year (of a total 15,000 hectares per year for the UK as a whole). The indicator framework has been developed by the CCC to monitor progress in reducing UK emissions on track for 2030 targets.

In the CCC’s higher scenario for emissions reductions, doubling the recommended rate of afforestation in Northern Ireland (to 1,800 hectares per year) would reduce overall emissions from the land use, land-use change and forestry sector (Table 8.19).

Table 8.19: Climate Change Committee’s “greenhouse gas” emissions scenarios for land use, land-use change and forestry in Northern Ireland to 2030 [148]

Climate Change Committee’s scenarios for land use, land-use change and forestry in Northern Ireland	Megatonnes of carbon dioxide equivalents released
1990	0.22
2016	0.28
Department of Agriculture, Environment and Rural Affairs projection 2030	0.22
United Kingdom Fifth Carbon Budget 2030	0.18
Higher rate of afforestation 2030	0.125

Ireland sustainability initiatives

In order to mitigate (lessen the effects of) risks to the environment posed by current production and consumption levels, and to reflect international policies on climate change, Ireland must work towards improved resource-efficiency and a sustainable environment [151].

Environmental Protection Agency Research Strategy 2014–2020

The Environmental Protection Agency Research Strategy 2014–2020 [151] focusses on 3 key pillars: climate, water and sustainability. The Agency’s research outputs between 2007 and 2013 have highlighted environmental challenges for Ireland. The current research aims to support the development and implementation of environmental policy by identifying pressures on the environment.

Bioenergy

The production and use of biomass are key contributions that can be made by the agriculture sector in order to meet renewable energy targets and a growing demand for sustainable sources of bioenergy [152].

Some examples of biomass that can be produced by the agriculture sector are

- Wood “thinnings” (trees that are removed to make more space for trees that are to be cropped to grow into)
- Agrifood by-products such as straw and processing waste (for example whey, the liquid left after milk has been curdled and strained)

European Union legislation frames Irish policy on bioenergy. An EU target of 32.0 per cent of total energy coming from renewable sources has been set by the (revised) Renewable Energy Directive (“RED II”) and should be reached by 2030. The target figure will be further revised in 2023 [153].

Agricultural Sustainability Support and Advisory Programme

The Agricultural Sustainability Support and Advisory Programme is a collaborative initiative supported by both the Department of Agriculture, Food and the Marine in Ireland (DAFM) and the Department of Housing, Planning and Local Government, alongside industry. The programme aims to promote farmer behavioural change for the protection of water, in line with the EU’s Water Framework Directive objectives, and aims to improve water quality [154].

“Sustainability advisors” have been assigned to advise farmers on specific strategies that can be used to improve water quality. Examples of advice given include more targeted use of fertiliser, and improved nutrient management.

The Dairy Carbon Navigator

The “Dairy Carbon Navigator” was developed by Teagasc (the Irish State agency providing research, advice and education in agriculture, horticulture, food and rural development in Ireland) and Bord Bia (an Irish state agency that promotes sales of Irish food and horticulture in Ireland and abroad) to support the “Sustainable Dairy Assurance Scheme” [155].

It focusses on 5 key efficiency measures that are suggested to reduce GHG emissions:

- Longer grazing season
- Increased Economic Breeding Index
- Improved nitrogen use efficiency
- Improved slurry management
- Energy efficiency

Table 8.20 outlines the proposed reductions in GHG emissions and other advantages of implanting the 5 key measures.

Table 8.20: The Dairy Carbon Navigator’s 5 key measures for lowering agricultural “greenhouse gases” [155]

Dairy Carbon Navigator key measures for lowering agricultural “greenhouse gases”	Impact on carbon footprint
Longer grazing season	<ul style="list-style-type: none"> • Grazed grass in the early and late season is a higher quality, more digestible feed than grass silage, leading to improvements in animal productivity and a reduction in the proportion of dietary energy lost as methane. • The shorter housing season leads to reduced slurry methane and nitrous oxide emissions from slurry storage. Energy use from spreading is also cut. • It is estimated that for every 10 days’ increase in grazing season there is a 1.7 per cent reduction in GHGs, and profitability is boosted by €27 per cow.
Improved Economic Breeding Index	<ul style="list-style-type: none"> • Improving fertility reduces calving interval and replacement rate, thus reducing enteric methane emissions per unit of product.

	<ul style="list-style-type: none"> • Increasing milk yield and composition increases the efficiency of production, which decreases emissions per unit of product. • More compact calving can increase the proportion of grazed grass in the diet and reduces culling and replacement rates. • Improved health reduces animal deaths and the incidence of disease, leading to higher productions levels and lower replacement rate.
Improved nitrogen use efficiency	<ul style="list-style-type: none"> • Improving nitrogen efficiency leads to improved utilisation of nitrogen by plants and lowers losses to the air and water. • The timing and method of slurry application has a significant effect on nitrogen utilisation. • Urea requires less energy (and carbon dioxide) to produce than calcium ammonium nitrate (also known as “nitro-limestone” or “nitrochalk”). • A reduction in nitrogen fertiliser of 10 kilograms per hectare will reduce farm GHG emissions by 1.0 per cent and improve income by €10 per hectare.
Improved slurry management	<ul style="list-style-type: none"> • Spring application reduces emissions following land spreading, due to the more favourable weather conditions (cool, with low sunlight) at that time of year. • Storage losses of methane are reduced, due to the shorter storage period. • Reduced ammonia losses increases the fertiliser replacement value and reduces fertiliser nitrogen and associated manufacture and spreading emissions. • Low emissions application technologies such as “trailing shoes” (which separate the crops while driving over them, so the manure can be deposited in a thin strip beneath the crops’ shoots) lead to reduced ammonia losses and increases the fertiliser replacement value of slurry. • A 20.0 per cent shift to spring application can reduce farm GHGs by 1.3 per cent, while a shift to use of a trailing shoe can reduce GHGs by 0.9 per cent.

Improved energy efficiency	<ul style="list-style-type: none"> • Ensure that you have effective pre-cooling of milk through a plate heat exchanger. • Use variable speed drive vacuum pumps. • Use energy-efficient water heating systems. • For a 100-cow herd, improving the performance of the plate cooler, installing a variable speed vacuum pump and changing the water heating to gas or oil can reduce enterprise GHG emissions by 1.1 per cent and lead to electricity savings of €1,400, which can provide a return on the investment in approximately 5 years.
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The Burren Programme

The Burren Programme aims to conserve the environment and support the heritage of the Burren region, which includes a number of Special Areas of Conservation [156]. The programme is farmer-led, with farmers given the autonomy to manage their land as they see fit (within the law).

Farmers are paid for actions that aim to improve the conservation condition of their land. They also benefit from a “results-based payment system”, where farms are scored annually according to a “habitat health” checklist. The data collected helps to highlight the positive environmental outcomes of the programme.

Farmers must pay for the services of a specialist-trained farm advisor, who will liaise with the farmer and the Burren Programme team.

The Afforestation Scheme

Forests and wetlands cover approximately 11.0 per cent of the total land area of Ireland. State grants awarded since the 1980s have increased forest growth over the past few decades. However, Ireland sits below the average EU forest coverage of 38.0 per cent [157]. The “Afforestation Scheme”, funded under the Forestry Programme 2014–2020, aimed to help Ireland reach the goal of 18.0 per cent forest cover by 2050.

The overall objectives of the scheme are to

- Increase Ireland’s forest cover to 18.0 per cent
- Ensure that at least 30.0 per cent of the area afforested comprises broadleaved trees (which generally have flat leaves, and seeds in fruits, rather than needle-like leaves, and seeds in cones), including native woodland

- Develop a forest-based biomass resource and generally encourage its use in domestic markets
- Increase levels of carbon sequestration, contributing towards climate change mitigation
- Encourage forest management practices that restore, preserve and enhance forest biodiversity
- Provide a resource that will contribute to long-term sustainable development in the rural economy

Climate-change preparedness

Northern Ireland climate-change preparedness

According to the CCC's UK Climate Change Risk Assessment 2017 Evidence Report, Northern Ireland's biodiversity is internationally important [158]. A number of protection measures have been put in place by both EU and national initiatives with the aim of protecting land and marine environments across Northern Ireland. The CCC have reported that more action is required to build resilience to climate-change risks that may affect soils, farming and marine ecosystems (amongst other examples).

The report has also identified that more action is needed to address

- Risks to soils from increased seasonal aridity and wetness
- Risks to natural carbon stores and carbon sequestration
- Risks to agriculture and wildlife from drought and flooding
- Risks to freshwater species from higher water temperatures and reduced water quality
- Risks to habitats and heritage in the coastal zone from sea-level rise
- Loss of natural flood protection

Northern Ireland Climate Change Adaptation Programme 2019–2024

The second Northern Ireland Climate Change Adaptation Programme highlights 2 major strategies for addressing climate change in Northern Ireland: mitigation (which aims to reduce GHG emissions by addressing and preventing the root cause of climate change) and adaptation [159]. Acknowledging that Northern Ireland as a region will undoubtedly experience further climate change, the report states that Northern Irish planning should evolve in line with the scientific evidence and understanding of climate change. The programme details 5 key priority areas and 7 key objectives, which are outlined in Table 8.21.

Table 8.21: Northern Ireland Climate Change Adaptation Programme 2019–2024 key priority areas and outcome objectives [155]

	Northern Ireland Climate Change Adaptation Programme 2019–2024 key priority areas	Northern Ireland Climate Change Adaptation Programme 2019–2024 outcome objectives and visions
NC	“Natural capital”, including terrestrial coastal, marine and freshwater ecosystems, soils and biodiversity	NC1: We will have species, habitats and water bodies that are resilient to the impacts of climate change.
		NC2: We have coastal communities, habitats, landforms and infrastructure that are resilient to the impacts of climate change.
		NC3: We have soils and woodland that are resilient to the impacts of climate change.
IF	Infrastructure services	IF1: We have transport and network services that are resilient to the impacts of flooding and extreme weather.
P	People and the built environment	P1: We have people, homes, buildings and communities that are resilient to the impacts of flooding and extreme weather.
B	Disruption to businesses and supply chains	B1: We have businesses that can adapt to the impacts of climate change and extreme weather.
I	Food security and global good protection	I1: We have a food system that is resilient to the impacts of climate change.

Ireland climate-change preparedness

Climate Action Plan

The Climate Action Plan states Ireland’s goal to deliver a “step change” (a significant, positive change) in emissions performance in line with the objectives of the Paris Agreement and the United Nations 2030 Agenda for Sustainable Development Goals [160]. The plan lays out abatement (or reduction) measures and 2030 targets in relation to 5 sectors identified to contribute the most to GHG emissions:

- Agriculture
- Transport
- Electricity

- The Built Environment
- Industry

The plan also reports Ireland's commitment to move towards 70.0 per cent of electricity needs to be supplied by renewable sources by 2030.

Summary

The agrifood sector plays a vital role to the economies across the island of Ireland. As a result of the relatively large proportion of economic activity from this sector, both jurisdictions have significantly higher levels of GHG emissions from the agrifood sector relative to the rest of the EU. In 2018, the Irish percentage of GHG emissions from agriculture was the highest in the EU (31.8 per cent), compared with the UK figure of 8.2 per cent.

To meet carbon reduction targets set out in UK and EU legislation, the island of Ireland must continue to further its efforts to reduce carbon emissions from the agricultural sector. Both jurisdictions have policies in place that aim to reduce the negative effects on the environment caused by GHG emissions from the agricultural sector (for example, the Efficient Farming Cuts Greenhouse Gases Implementation Plan 2016–2020 in Northern Ireland and the Dairy Carbon Navigator in Ireland).

Collaboration between government and farmers to adopt and implement efficient farming strategies (such as better livestock management and changes to fertiliser use) will ensure that the island of Ireland moves towards more sustainable farming and reduced GHG emissions in the coming years.

9 Food waste

Introduction

Section 9 of the compendium provides an overview of the key statistics relating to food waste on the island of Ireland. There are varying definitions for “food waste”; however, the most commonly accepted definition in the UK and the EU is from the work of the EU “FUSIONS” (Food Use for Social Innovation by Optimising Food Waste Prevention Strategies) project, which defines food waste as

“Any food, and inedible parts of food, removed from the food supply chain to be recovered or disposed (including composting, crops ploughed in or not harvested, anaerobic digestion, bioenergy production, co-generation, incineration, disposal to sewer, landfill or discarded to sea)” [161].

The “food supply chain” comprises (according to the UK House of Lords EU Sub-committee on Agriculture, Fisheries, Environment and Energy investigating food waste prevention) producers and growers, manufacturers and processors, the hospitality sector and retailers and consumers [162].

Food waste has been designated a “data-poor” area. A number of studies across the island of Ireland have noted the difficulty in measuring the amount of food that is wasted across the food supply chain. Nevertheless, this section of the compendium shows data for Northern Ireland and Ireland where available.

Please note that the figures presented are largely drawn from existing studies that do not necessarily represent data at a national level.

Overview of the food supply chain

An estimate of food waste in the EU indicates that approximately 20.0 per cent of the total food produced was wasted in 2011 to 2012 [163].

Table 9.1 shows the contribution of different sectors to food waste in the EU in 2016. Households contribute over half of all wasted food (53.0 per cent).

Table 9.1: Estimates of food waste in the 28 Member States of the European Union by sector as a percentage of total food waste in 2016 [163]

Sector	Estimated contribution to food waste as a percentage (%) of total food waste among the 28 Member States of the European Union in 2016
Households	53
Food service	12
Wholesale and retail	5
Processing	19
Production	11

Figure 9.1 shows the nature of the food and drink supply chain from the original producer through to manufacturers, processors, retailers, food service and hospitality (public houses, or “pubs”, restaurants, hotels and caterers) and, finally, the consumer. While simplified, Figure 8.1 shows that the supply chain involves a multitude of different relationships, depending on the product and the ultimate consumer.

Figure 9.1: The food and drinks supply chain [161].

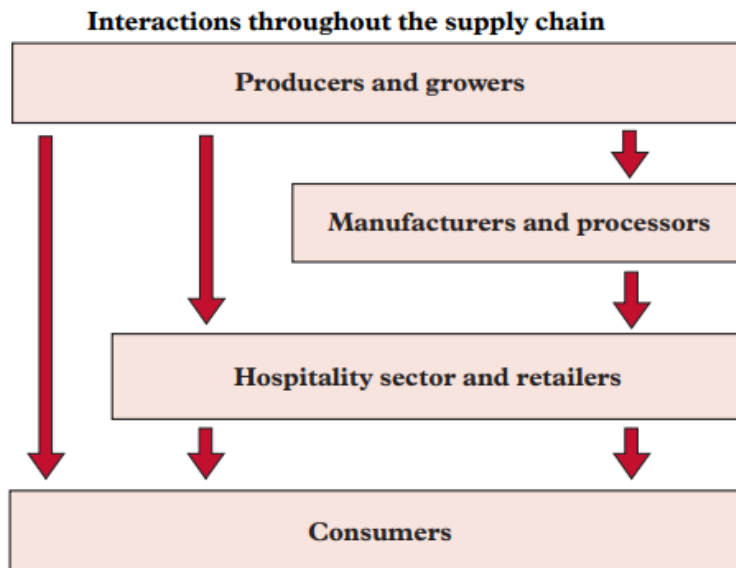
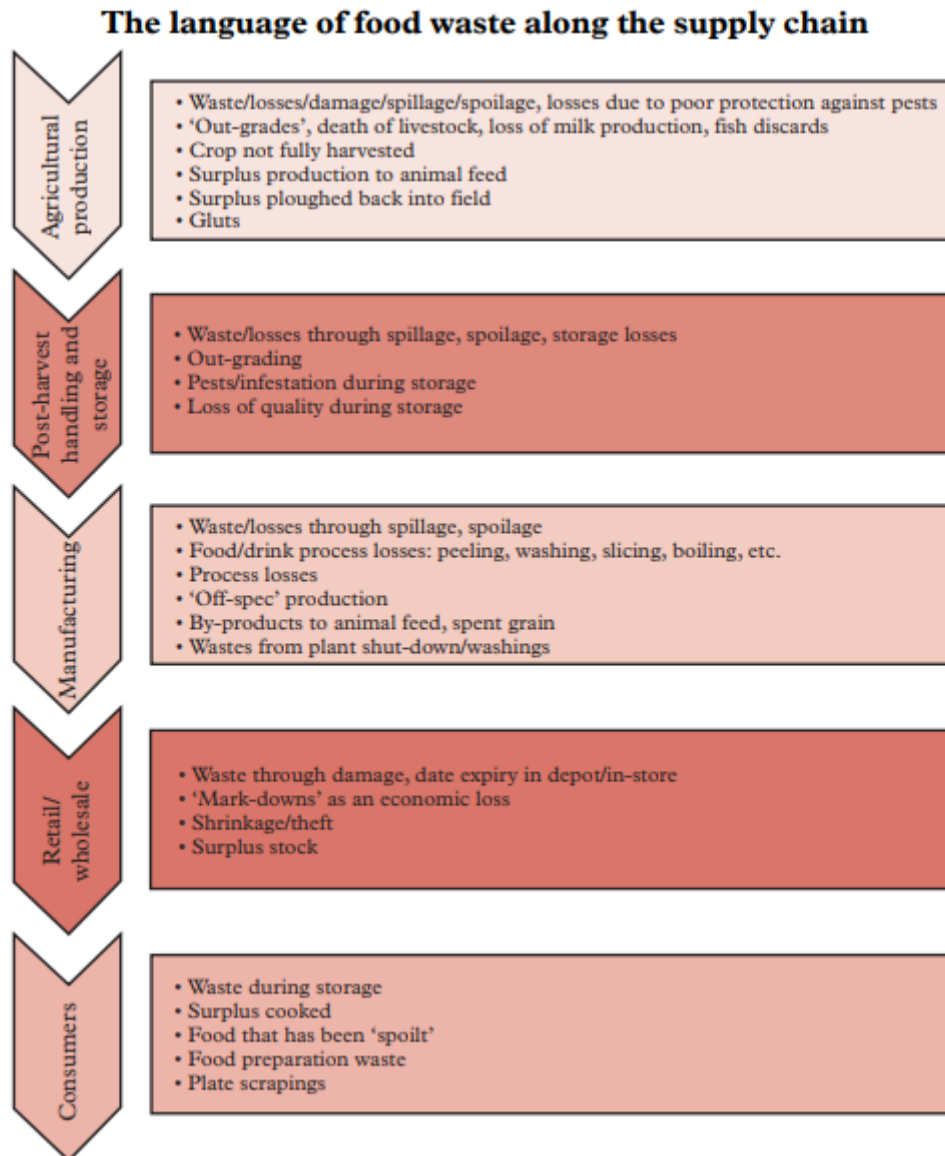


Figure 9.2 shows the different stages of the food supply chain and the definitions of food waste associated with each stage.

Figure 9.2: Different definitions of “food waste” along the supply chain [161]



Waste from manufacturing and processing food and drinks

United Kingdom waste from manufacturing and processing food and drinks

The Food and Drink Federation (FDF) represents the UK food and drink industry, the largest manufacturing sector in the country [164]. A survey was commissioned jointly by FDF and the Waste and Resources Action Programme in 2015 to collect data on food and packaging waste arising from FDF members' manufacturing sites [165]. Data was collected from surveys that used a consistent methodology, meaning there are also food and packaging waste data available from 2006, 2008, 2009 and 2012.

As part of the survey, FDF member sites were asked to describe the origin of their food waste, both in their segregated (separated and sorted) food waste and mixed food and packaging waste streams. Sites were asked to state how much of their food waste is derived from

- Raw materials and ingredients that end up as waste before the food production stage
- Food waste from the production process (work in progress), before the end of the production process
- Unpackaged, finished products
- Packaged, finished products

Table 9.2 shows the volume of food waste redistributed to people through charitable and commercial routes, according to the FDF Members' Waste Survey [166].

The main reasons given for not redistributing more food surpluses were that the material

- Was not suitable for human redistribution
- Raised brand integrity concerns
- Was sent to be used as animal feed

Table 9.2: Food waste redistribution (in tonnes) according to the United Kingdom Food and Drink Federation Members' Waste Survey 2015 [165]

Type of food waste redistribution	Number of United Kingdom Food and Drink Federation Members' production sites	Tonnage of food waste redistributed
Commercial	24	2,810
Charitable	6	51
Total	25	2,860

Table 9.3 shows the diversion of surpluses (extra or excess food material) to animal feed according to the FDF Members' Waste Survey. Of the 23 sites that responded (and representing 25.0 per cent of total food production captured in the survey), 43,200 tonnes of surpluses were reported to have been diverted to animal feed.

Table 9.3: Food waste diverted to animal feed, according to the United Kingdom Food and Drink Federation Members' Waste Survey 2015 [165]

Source of diverted food material	Number of United Kingdom Food and Drink Federation Members' production sites	Total tonnage diverted	Proportion of sites' production diverted to animal feed, as a percentage (%)	
			Only sites reporting diversion to animal feed	All surveyed sites
Surpluses	23	43,200	Only sites reporting diversion to animal feed	All surveyed sites
			3.8	0.9

Household and consumer waste

Household and consumer waste in Northern Ireland

Table 9.4 shows the quarterly household waste composting rates for Northern Ireland from 2015 to 2019. Figures are shown for "dry" recycling – food and drinks packaging recycling – and for food waste composting.

Table 9.4 Composting rate as a percentage of total tonnes of Northern Ireland household waste arising from 2015 to 2019 [166]

Quarterly period	Total Northern Ireland household waste arising, in tonnes	“Dry” recycling rate as a percentage (%) of total household waste	Food waste composting rate as a percentage (%) of total household waste
April to June 2015	225,033	21	24
July to September 2015	228,383	20	25
October to December 2015	204,611	23	17
January to March 2016	202,760	25	14
April to June 2016	231,736	22	25
July to September 2016	237,799	21	27
October to December 2016	203,930	24	19
January to March 2017	202,500	25	15
April to June 2017	234,904	22	28
July to September 2017	233,428	22	29
October to December 2017	207,192	24	23
January to March 2018	198,732	26	18
April to June 2018	242,675	23	30
July to September 2018	228,641	23	29
October to December 2018	207,002	24	24
January to March 2019	200,845	26	21

Municipal waste tracking in the United Kingdom including Northern Ireland

United Kingdom estimates for biodegradable municipal waste (BMW) going to “landfill” (that is, burial at a designated tip or dump site) have been calculated in accordance with the EU

Landfill Directive (Council Directive 1999/31/EC), which aims to prevent or reduce as far as possible the negative effects of landfilling waste.

“Biodegradable municipal waste” is the fraction of municipal waste that will decompose within a landfill to produce methane, a potent “greenhouse gas”. Amongst other materials it will include food waste, green waste, cardboard and paper.

Within the Landfill Directive, the UK has 3 targets to meet, measured as a percentage of the tonnage of BMW generated in 1995 (“the 1995 baseline”) (Tables 9.5 and 9.6). The targets require the tonnage of BMW to landfill to be

- No greater than 75.0 per cent of the 1995 baseline by 2010
- No greater than 50.0 per cent of the 1995 baseline by 2013
- No greater than 35.0 per cent of the 1995 baseline by 2020

For this reporting obligation, the UK countries have agreed a set of European Waste Catalogue (EWC) classification codes to represent “municipal waste”. Countries use broadly similar (but non-identical) sets of factors for the proportion of each EWC code that is biodegradable, based upon composition studies of landfill waste [167].

Table 9.5: Biodegradable municipal waste going to landfill (as a percentage of the 1995 baseline) in the United Kingdom, by country, from 2010 to 2017 [168]

United Kingdom country	2010	2011	2012	2013	2014	2015	2016	2017
England	36.0	32.5	28.0	25.5	23.0	20.5	20.5	19.5
Northern Ireland	46.0	38.0	33.0	24.0	26.0	25.0	26.0	24.5
Scotland	42.0	38.0	37.0	33.0	31.5	30.5	31.5	30.5
Wales	33.0	29.0	28.0	26.5	22.0	16.0	15.5	16.0
Whole United Kingdom	36.0	33.0	28.0	26.0	24.5	21.0	21.0	20.5

Table 9.6: Municipal waste going to landfill, and the amount of which is biodegradable municipal waste going to landfill, in tonnes, in the United Kingdom by country from 2010 to 2017 [168]

Year	Measure	UK	England	Northern Ireland	Scotland	Wales
1995	Biodegradable municipal waste generated in tonnes (the baseline measure)	35,688	29,030	1,225	3,494	1,837
2010	Municipal waste going to landfill in tonnes	25,019	20,298	893	2,508	1,319
	(Of which is) biodegradable municipal waste going to landfill in tonnes	12,982	10,339	558	1,484	600
2011	Municipal waste going to landfill in tonnes	22,879	18,421	734	2,560	1,164
	(Of which is) biodegradable municipal waste going to landfill in tonnes	11,725	9,360	464	1,364	538
2012	Municipal waste going to landfill in tonnes	20,260	16,187	622	2,429	1,023
	(Of which is) biodegradable municipal waste going to landfill in tonnes	10,372	8,129	394	1,327	522
2013	Municipal waste going to landfill in tonnes	18,450	14,780	472	2,244	954
	(Of which is) biodegradable municipal waste going to landfill in tonnes	9,325	7,347	299	1,182	497
2014	Municipal waste going to landfill in tonnes	17,281	13,714	511	2,194	862
	(Of which is) biodegradable municipal waste going to landfill in tonnes	8,726	6,843	322	1,137	424
2015	Municipal waste going to landfill in tonnes	15,605	12,215	484	2,264	642
	(Of which is) biodegradable municipal waste going to landfill in tonnes	7,693	5,980	307	1,095	311
2016	Municipal waste going to landfill in tonnes	16,111	12,381	524	2,306	900
	(Of which is) biodegradable municipal waste going to landfill in tonnes	7,807	6,049	331	1,140	286
2017	Municipal waste going to landfill in tonnes	15,263	11,784	539	2,262	678

Year	Measure	UK	England	Northern Ireland	Scotland	Wales
	(Of which is) biodegradable municipal waste going to landfill in tonnes	7,388	5,684	302	1,092	311

Notes: The 1995 target baseline was modelled and agreed in 2010.

Individual countries may not exactly sum up to the UK total, due to rounding.

Minor revisions made to historical figures for the UK and Scotland (2011 to 2016) and Wales (2016).

The Food Waste Regulations (Northern Ireland) 2015 came into operation on 14 February 2015. The regulations provide for the separate collection and subsequent treatment of food waste and requires the Northern Irish district councils to

- Provide receptacles for the separate collection of food waste from households
- Place a duty on food businesses producing in excess of 5 kilograms of food waste per week to present food waste for separate collection
- Place a duty on businesses to ensure food waste is not deposited in a lateral drain or sewer

The regulations place a duty on those who transport food waste to collect and transport such waste separately from other waste, to ensure that it is not mixed with other waste to the extent that would hamper future recycling.

The landfilling of separately collected food waste is prohibited from 1 April 2015 [168].

10 Regulation and enforcement

Introduction

Section 10 of the compendium provides an overview of the key statistics relating to actions against food businesses, food alerts and food sampling data in Northern Ireland and Ireland. There is an abundance of legislation and regulations relating to food safety and hygiene in the production, serving and selling of food in both jurisdictions, some of which are listed here.

Northern Ireland legislation and regulations

- Food Safety (Northern Ireland) Order 1991
- Food Hygiene Regulations (Northern Ireland) 2006
- Official Feed and Food Controls Regulations (Northern Ireland) 2009
- Diseases of Animals (Northern Ireland) Order 1981
- Consumer Protection (Northern Ireland) Order 1987
- Regulation (EC) No 852/2004 of the European Parliament and of the Council of 29 April 2004 on the hygiene of foodstuffs
- Directive 93/43/EEC on the hygiene of foodstuffs (Industry Guides to Good Hygiene Practice)

Authorities with a responsibility for the execution and enforcement of the legislation include the Department of Health, the Food Standards Agency in Northern Ireland (FSA), the Department of Agriculture, Environment and Rural Affairs in Northern Ireland (DAERA) and local authorities.

Ireland legislation and regulations

- Food Safety Authority of Ireland Act 1998
- European Communities (Official Control of Foodstuffs) Regulations 2010 (S.I. No. 117 of 2010)
- Regulation (EU) No 652/2014 (OJ L189, p1, 27/06/2014) of the European Parliament and of the Council of 15 May 2014 laying down provisions for the management of expenditure relating to the food chain, animal health and animal welfare, and relating to plant health and plant reproductive material

- Regulation (EC) No 178/2002 of the European Parliament and of the Council of 28 January 2002 laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety (OJ L31, p1, 1/02/2002)

Authorities with a responsibility for the execution and enforcement of the legislation in Ireland include the Department of Health, the Health Service Executive (HSE), the Food Safety Authority of Ireland (FSAI), the Department of Agriculture and the Marine (DAFM) and local authorities.

Inspections and enforcements

Northern Ireland inspections and enforcements

The FSA in Northern Ireland is responsible for the enforcement of food hygiene legislation and monitoring and reporting on the performance of local authority food law enforcement services in Northern Ireland. Almost 22,000 food establishments were registered with the FSA in 2018 to 2019.

In 2018 to 2019, 7,351 inspections of food business were conducted – an increase of 569 since 2014 to 2015. By contrast, 58 enforcement actions were made in 2018 to 2019, compared with 98 in 2014 to 2015 (Table 10.1) [169].

Table 10.1: Inspections and food standards enforcement actions in establishments in Northern Ireland from 2014 to 2019 [169]

Actions	2018/19	2017/18	2016/17	2015/16	2014/15
Inspections made	7,351	8,553	TBC*	6,038	6,782
Voluntary closure	10	13	5	15	6
Seizure, detention and surrender of food	17	31	33	42	26
Suspension or revocation of approval or licence	0	0	1	3	0
Hygiene emergency prohibition notice	0	1	1	3	0
Hygiene prohibition order	0	1	0	2	0
Simple caution	3	2	0	14	9
Hygiene improvement notices	10	14	19	45	31
Remedial action and detention notice	12	7	16	14	14

Actions	2018/19	2017/18	2016/17	2015/16	2014/15
Prosecutions concluded	6	3	9	10	9
Total enforcement actions	58	72	84	148	95

* TCB: To be confirmed

Ireland inspections and enforcements

The FSAI is responsible for the enforcement of food safety legislation in Ireland. It works with other agencies, including county councils and the Environmental Health Service (EHS) within the Health Service Executive (HSE), to conduct inspections of food businesses.

Between 2014 and 2018, in the region of 50,000 inspections of food businesses were carried out each year in Ireland (Table 10.2). The majority of these were made by the EHS.

Table 10.2: Inspections of food businesses in Ireland from 2014 to 2018 [170]

Official inspection agency	2014	2015	2016	2017	2018
Health Service Executive (Environmental Health Service)	35,053	36,353	35,786	33,193	32,254
Department of Agriculture, Food and the Marine	15,021	15,011	11,985	11,569	10,826
Local authorities	4,802	5,033	4,870	4,891	4,582
Sea-Fisheries Protection Authority	2,035	2,015	2,228	2,245	2,122
National Standards Authority of Ireland	77	61	72	84	62
Total number of food business inspections	56,988	58,473	54,941	51,982	49,846

As noted above, inspections by EHS and DAFM account for the majority (86.0 per cent) of inspections in 2018. Inspections include premises such as businesses serving food, food producers and abattoirs.

Once food businesses have been inspected, each agency has a range of actions that they may enforce if food hygiene standards are not met or if food safety legislation is not adhered to [171]. Enforcement powers include

- Improvement Notice. Issued when an authorised officer is of the opinion that a premises or practice is of such a nature that, if it persists, it will or is likely to pose a risk to public health, for example any activity involving the handling, preparation and so on of food, or the condition of a premises (or part thereof) where this activity takes

place is such that if it persists, it will or is likely to pose a risk to public health. (Data on improvement notices is not published.)

- Improvement Order. Issued when improvement notices have not been complied with.
- Closure Order. Issued if, in the opinion of the authorised officer, there is or there is likely to be a grave and immediate danger to public health at or in the food premises.
- Prohibition Order. Issued if the activities (handling, processing, disposal, manufacturing, storage, distribution or selling food) involve or are likely to involve a serious risk to public health from a particular product, class, batch or item of food. The effect is to prohibit the sale of the product, either temporarily or permanently.

Table 10.3 provides data on the number of enforcements in Ireland over the period 2015 to 2019.

Table 10.3: Enforcement actions against food businesses in Ireland from 2015 to 2019 [171]

Year	Closures	Improvements	Prohibition	Total
2015	90	0	16	106
2016	94	3	9	106
2017	64	1	4	69
2018	95	5	10	110
2019	108	4	13	125

Consumer complaints

In 2019, the FSAI advice line (in Ireland) received 3,461 complaints about food [172]. As can be seen in Table 10.4, this was the highest number since 2013.

Table 10.4: Complaints to the Food Safety Authority of Ireland advice line from 2013 to 2019 [173] [174] [175]

	2013	2014	2015	2016	2017	2018	2019
Number of complaints to the Food Safety Authority of Ireland advice line	2,846	2,738	2,739	3,202	3,400	3,424	3,461

In 2019, over half of complaints were related to complaints of unfit food and poor hygiene standards. A considerable increase was also noted from 2018 among issues relating to poor hygiene standards, at 19.0 per cent, and suspected food poisoning incidents were up 8.0 per cent.

Consumer complaints ranged from reports of food unfit to eat to non-display of allergen information:

- 1,134 complaints on hygiene standards
- 1,082 complaints on unfit food
- 792 complaints on suspected food poisoning
- 149 complaints on incorrect information on food labelling
- 135 complaints on non-display of allergen information
- 113 other complaints

Contamination of food with foreign objects was frequently reported by consumers. In 2019, these reports included allegations of food containing insects, plastics and other foreign objects.

Complaints regarding poor hygiene standards in food premises cited live mice and evidence of rodent activity throughout food handling and storage areas, staff failing to wash their hands when cooking and serving food, pigeons in the deli area and flies throughout a premises.

Food alerts

Food alerts across the island of Ireland

“Food alerts” are notifications issued by the FSAI (in Ireland) and the FSA (in Northern Ireland) to official agencies and food businesses or other businesses relating to an identified hazard. “Identified hazard” means a biological, chemical or physical agent in, or the condition of, food or food contact materials with the potential to cause an adverse health effect. Food safety information may also be communicated between the European Commission and member states using the Rapid Alert System for Food and Feed (RASFF).

Examples of recent food alerts have included

- *Escherichia coli* (*E. coli*) O26 in unpasteurised (partially sterilised) milk cheese
- Metal pieces in prepared dishes
- Foods found to contain insects
- Detection of *Listeria monocytogenes* in products such as poultry and dairy
- *Salmonella* in hummus

“Allergen alerts” relate to the presence of ingredients such as milk, cereals, eggs or nuts in a product that is incorrectly labelled or not declared in food products ingredients.

In 2019, the FSAI dealt with 679 food incidents, resulting in 107 food or food allergen alerts being issued (Table 10.5). The alerts were issued in conjunction with either product recalls or withdrawals from the Irish market for various reasons including microbiological, chemical or foreign body contamination or mislabelling.

Table 10.5: Food alerts and food allergen alerts issued in Ireland from 2016 to 2019 [176] [177] [178]

Year	Number of food alerts issued in Ireland	Number of food allergen alerts issued in Ireland	Total number of alerts issued in Ireland
2016	39	28	67
2017	24	30	54
2018	51	45	96
2019	55	52	107

In 2019, 52 food allergen alerts were issued. In the EU, there are 14 specified foods that can cause allergies or intolerances that must be labelled or declared if used as ingredients. Incorrect labelling may trigger a food allergen alert. In Ireland, milk, cereals, eggs and nuts

were amongst the most common allergens incorrectly labelled or declared in 2019. The main reasons for these alerts were

- The allergen was a contaminant in the product and therefore not highlighted on the ingredients label.
- The ingredients list or label was not in English.
- The product was packed in the wrong pack.
- The allergen ingredients were not properly highlighted.

Data from across Europe are also published on the RASFF portal. Table 10.6 provides an overview of the notifications that originated in Ireland and the UK over the past 5 years. Data on the RASFF portal are not available specifically for Northern Ireland; these are included in the data for the whole UK.

Table 10.6: Rapid Alert System for Food and Feed notifications originating from Ireland and the United Kingdom from 2015 to 2019 [179]

Rapid Alert System for Food and Feed notification type	2015		2016		2017		2018		2019	
	Ireland	UK	Ireland	UK	Ireland	UK	Ireland	UK	Ireland	UK
Alert	24	35	15	41	28	50	10	74	19	57
Border rejection*	12	251	5	243	6	275	0	193	0	232
Information or news or other type of notification	21	51	11	65	34	49	19	86	15	98
Total notifications	57	337	31	349	68	374	29	353	34	387

* “Border rejection” in Table 9.6 means the material was tested and rejected at the border before entering the European Union and European Economic Area.

Food sampling

There are a number of European Commission Directives that set out the frequency at which various foodstuffs should be sampled. For example, Regulation (EC) No 2073/2005 of 15 November 2005 on microbiological criteria for foodstuffs sets down a fixed weekly sampling frequency for the food business operators for certain products, such as carcasses, minced meat, meat preparations and mechanically separated meat [180].

Northern Ireland food sampling

Local authorities in Northern Ireland are required to test samples of food to enforce food hygiene legislation and to assist in the protection of public health, in line with their responsibilities around food law. Food sampling enables the collation of information about the quality and safety of food produced, handled and sold in that local government district.

Approximately 50.0 per cent of food for sale in the UK is imported. The FSA requires all local authorities to take steps to ensure imported food has been legally introduced and that it is safe for the consumer. Table 10.7 provides an overview of the official sampling of foodstuffs undertaken in Northern Ireland over the period between 2014 to 2015 and 2018 to 2019.

Table 10.7: Food sampling data for Northern Ireland over the period from 2014/15 to 2018/19 [181]

Type of food sampling activities carried out in Northern Ireland	2014/15	2015/16	2016/17	2017/18	2018/19
Microbiological contamination	6,308	5,961	6,616	6,059	6,419
Composition	1,307	1,758	1,971	2,142	1,902
Other contamination	284	308	29	29	26
Labelling and presentation	556	1,138	1,550	1,839	1,300
Other and unspecified activities	470	714	-	184	279
Total food sampling activities	7,881	8,333	8,909	8,693	9,072

Each year, the most frequent sampling tests related to microbiological contamination. The total number of sampling tests completed each year has increased annually, rising to 9,072 in the period 2018/19.

Ireland food sampling

The FSAI annual report provides information on the level and range of sampling activities undertaken as part of their remit to ensure “Food and food safety, integrity and wholesomeness at any stage of production, processing and distribution of food” [182].

Sampling data for Ireland from 2015 to 2018 are shown in Table 10.8.

Table 10.8: Food sampling activity carried out in Ireland from 2015 to 2018[182]

Food sampling agency	2015	2016	2017	2018
Department of Agriculture, Food and the Marine	30,333	31,456	32,947	35,983
Health Service Executive (Environmental Health Service)	13,744	12,330	11,699	11,678

Sea-Fisheries Protection	8,229	9,004	8,353	8,386
Local authority	3,107	2,388	3,306	3,195
Other agencies	1,262	520	1,335	4,597
Total food sampling activities	56,675	56,588	57,640	63,839

The trend in sampling activity in Ireland between 2015 and 2018 was generally increasing, rising to almost 64,000 in 2018. As with inspections, the majority of sampling is conducted by the EHS and DAFM (75.0 per cent in 2018).

Sampling involves a number of different tests, including

- Microbiological tests for pathogens (disease-causing organisms such as bacteria, viruses or moulds)
- Testing for pesticides
- Testing for the presence of contaminants
- Checks on ingredients labelling

In 2018, 41,706 microbiological tests were completed, which included 10,029 samples of dairy products for *Salmonella* monitoring, hygiene monitoring and process hygiene [Error! Bookmark not defined.].

Summary

There is a range of legislation and European Communities Directives that apply in Ireland and Northern Ireland to ensure that food and drink is safe. There is also a considerable level of associated activity on the island of Ireland relating to enforcement and surveillance of food safety legislation.

In 2018, over 57,000 inspections of food businesses were made across the island of Ireland. These resulted in 168 enforcements, including 105 closures of food businesses. Sampling is also a key activity of both the FSAI and FSA and, in 2018, over 72,000 food samples were tested across the island of Ireland.

Whilst separate data are not available for Northern Ireland from the RASFF portal, it does show that in 2019 there were 34 RASFF notifications relating to Ireland, down from 57 in 2015.

11 Food safety

Introduction

Section 11 of the compendium begins with an introduction to food safety issues throughout the world, and common causes of foodborne illness. Data about people's attitudes, awareness and behaviours in regard to food safety data from the island of Ireland is then presented. This data looks at issues such as food safety among consumers and food business, including food preparation and storage behaviours.

Finally, data is presented relating to zoonoses. "Zoonoses" are diseases or infections that can pass naturally from animals to humans. Comparative zoonoses data is presented as average rates for Ireland, Northern Ireland, the UK and the EU, as well as worldwide foodborne illness death rate data.

Food safety worldwide

The most recent report estimating global rates of foodborne diseases was published by the World Health Organization (WHO) in 2015 [183]. That publication was the first of its kind to estimate global rates of foodborne disease.

The report stated that an estimated 600 million people (almost 1 in 10 people) fall ill after eating contaminated food each year and approximately 420,000 people die annually as a result. It was estimated that 30.0 per cent of deaths from foodborne diseases occur among children under 5 years of age (despite this age group only accounting for 9.0 per cent of the global population). The WHO estimates that 33 million years of healthy lives are lost globally each year due to eating unsafe food – and that this is likely an underestimation.

Diarrhoeal diseases are responsible for more than half of the global burden of foodborne diseases, causing 550 million people to fall ill and 230,000 deaths each year. Children are at particular risk of foodborne diarrhoeal diseases, with 220 million falling ill and 96,000 dying annually [184]. Globally, diarrhoea is often caused by eating raw or undercooked meat, eggs and dairy products contaminated by norovirus, *Campylobacter*, non-typhoidal *Salmonella* and pathogenic *Escherichia coli* (*E. coli*).

Other major contributors to the global burden of foodborne illnesses are

- Typhoid fever (caused by *Salmonella typhi* bacteria)
- Hepatitis "A" (a virus that causes liver infection)

- *Taenia solium* (pork tapeworm, a parasite)
- Aflatoxins (cancer-causing and gene-damaging poisons caused by a mould found on some agricultural crops such as corn, grains and peanuts)

Certain diseases, such as those caused by non-typhoidal *Salmonella*, are a public health concern across all regions of the world, in both high-income and low-income countries. Other diseases, such as typhoid fever, foodborne cholera and those caused by pathogenic *E. coli*, are much more common in low-income countries, while *Campylobacter* is an important pathogen in high-income countries [184].

Foodborne diseases can cause short-term symptoms, such as nausea, vomiting and diarrhoea (commonly referred to as food poisoning). They can also cause longer-term illnesses, such as cancer, kidney or liver failure, and brain and neural disorders. These diseases may be more serious in children, pregnant women and those who are elderly or have a weakened immune system.

Low-income areas are more likely to be negatively affected by foodborne illnesses. This is linked to preparing food with unsafe water; poor hygiene and inadequate conditions in food production and storage; lower levels of literacy and education; and insufficient food safety legislation or implementation of such legislation.

However, higher income countries are also significantly affected by foodborne disease. Increased product shelf-life and globalisation have led to longer and vastly more complicated food chains, potentially presenting greater opportunity for contamination and microbial growth to occur [185].

Despite innovative and comprehensive modern systems that are now used to manage food safety and assess risks, food contamination still occurs across the world. Contamination of food, through both human error and organic causes, can undermine even the most carefully prepared and executed Hazard Analysis Critical Control Point (HACCP) system.

Food safety data availability

This chapter sets out the rates of foodborne diseases across the island of Ireland, based on available data at the time of writing. However, as “Codex Alimentarius” (a collection of internationally recognised standards for food) notes, obtaining reliable data is difficult for a number of reasons. For example, many people do not consult a doctor after getting ill from food they have consumed [186]. Therefore, the true scale and cost of foodborne diseases are often unknown, due to cases not being reported, investigated or recognised.

At the Forty-first Session of the Codex Alimentarius Commission, in 2019, calls were made for countries across the globe to build capacity with regard to foodborne illnesses, which would improve data collection policies. Nonetheless, this section of the compendium outlines important and comparable food safety data across the island of Ireland and the UK, gathered from a range of sources.

Consumers' attitudes, awareness and behaviours around food safety on the island of Ireland

Results from the Food Standards Agency Biannual Public Attitudes Tracker Survey Northern Ireland

The FSA conducts a tracking survey in Northern Ireland to measure self-reported food-related activities. The latest results are based on 467 interviews [187].

Table 11.1 shows the extent of agreement among Northern Irish consumers to food safety statements.

Table 11.1: Agreements with food safety statements, from the Food Standards Agency Biannual Public Attitudes Tracker Survey Northern Ireland 2019 [188]

Statement in the Food Standards Agency Biannual Tracker Survey, 2019	Percentage of respondents who agree (%)	Percentage of respondents who disagree (%)
I always avoid throwing away food.	63	23
I am unlikely to get food poisoning from food prepared in my own home.	71	16
If you eat out a lot, you are more likely to get food poisoning.	33	38
Restaurants and catering establishments should pay more attention to food safety.	77	8
I often worry about whether the food I have is safe to eat.	21	63
When preparing food, I could be more careful about hygiene.	46	43

Results from the Food Standards Agency Biannual Public Attitudes Tracker Survey United Kingdom

In terms of the broader UK population, the FSA conducts the same biannual tracking survey across the UK – including Northern Ireland – with consumers, to monitor changes in attitudes towards food-related issues [63]. The latest “wave” (the latest survey) was conducted in November 2019 [189]. According to this survey, the top food safety issues of concern for those surveyed were

- Chemicals from the environment, such as lead, in food (32.0 per cent of respondents)
- Food hygiene when eating out (31.0 per cent of respondents)
- The use of pesticides to grow food (31.0 per cent of respondents)
- Food poisoning (28.0 per cent of respondents)

Awareness of different types of food poisoning has gradually increased in the last 2 years of this survey. While awareness of *Salmonella* (now at 92.0 per cent of respondents) and *E. coli* (86.0 per cent) were already relatively high, awareness of norovirus (60.0 per cent) and *Listeria* (61.0 per cent) have increased by 8.0 and 15.0 percentage points since November 2017, respectively.

Table 11.2 shows the trends in relation to consumer awareness around certain food poisoning organisms.

Table 11.2: Awareness of different types of food poisoning organisms, from the Food Standards Agency Biannual Public Attitudes Tracker Survey United Kingdom from 2017 to 2019 [189]

Food Standards Agency Biannual Public Attitudes Tracker Survey Wave	Percentage of respondents who were aware of <i>Salmonella</i>	Percentage of respondents who were aware of <i>E. coli</i>	Percentage of respondents who were aware of <i>Listeria</i>	Percentage of respondents who were aware of norovirus
Wave 16 – November 2017	89	82	47	53
Wave 17 – May 2018	91	85	51	56
Wave 18 – November 2018	89	82	50	50
Wave 18 – May 2019	90	84	52	59
Wave 19 – November 2019	92	86	61	60

In relation to where participants anticipate the most danger around food, 45.0 per cent of respondents reported concern about food safety in UK restaurants, pubs, cafes and takeaways and 40.0 per cent of respondents reported concern about food safety in UK shops and supermarkets.

To our knowledge, there is no directly comparable data relating to Ireland.

Results from *safefood safetrak*

Based on advertising tracking research by Ipsos® MRBI on behalf of **safefood** in 2017, positive findings were recorded relating to food safety, with 71.0 per cent of consumers in Ireland feeling well informed about food safety issues [190]. Despite this, 53.0 per cent of consumers in Northern Ireland and 51.0 per cent of consumers in Ireland said they were concerned about food safety. According to that research, the 3 food issues that are of most concern to consumers in Northern Ireland and Ireland are

- Food poisoning (*Salmonella*, *Listeria* or *E. coli*)
- Additives (“E numbers”, dyes or preservatives)
- Chicken (preparation)

The 3 places that consumers are most concerned about in relation to food safety are

- Chip vans
- Takeaway or “fast food” outlets
- Market stalls

The 3 foods that consumers are most concerned about are

- Chicken or other poultry
- Shellfish
- Red meat

Results from the Food Safety Authority of Ireland consumer research

In February 2019, the FSAI launched its vision and strategy for the next 5 years, along with the findings from a survey that was designed to capture consumer attitudes relating to food safety and hygiene, shopping habits and eating out, and concerns around food and the food industry [191] [192].

The survey findings demonstrated confidence in the safety of Irish food with 89.0 per cent of respondents saying food is as safe or safer than it was 5 years ago. However, consumers also admitted that they are prone to “risky” behaviours in relation to food handling at home, with 45.0 per cent of those surveyed saying they do not pay full attention to “use by” dates and 72.0 per cent claiming they have used food past its “use by” date. In addition, 62.0 per cent of consumers surveyed said they left leftovers to cool out of the fridge overnight, to eat in the next couple of days, with nearly half (49.0 per cent) storing food in the fridge without any wrapping.

Food safety knowledge and skills in small food businesses on the island of Ireland

Results from *safe*food

In 2018, *safe*food published research about food safety knowledge and skills among small and medium-sized enterprises (SMEs) on the island of Ireland [189]. Based on surveys, interviews and food safety audits, the research found that

- When asked to rate their understanding of the current obligations with regard to food safety requirements, 79.0 per cent of participants rated themselves as aware of their obligation.
- The majority (95.0 per cent) of food sector SMEs had received formal training in food safety and HACCP.
- Most respondents demonstrated a good knowledge of food safety and the purpose behind food safety regulation.
- Despite demonstrating an understanding of food safety, a clear majority of food sector SMEs described the challenges in meeting current food safety requirements, particularly the amount of paperwork and time involved.
- Out of 150 businesses audited, 117 (78.0 per cent) demonstrated good practices and far outweighed those who recorded critical food safety issues. Nonetheless, 22.0 per cent of SMEs recorded critical issues.

To our knowledge, there is no available data that breaks these findings down into figures for Northern Ireland and Ireland separately.

Results from the Food Safety Authority of Ireland food business research

In July 2019, the FSAI reported that, among food businesses in Ireland, food safety and staffing were the top concerns [193]. The results of the survey found that

- Seven out of 10 food businesses are increasingly confident about food safety regulation in Ireland, with almost three-quarters (73.0 per cent) stating that food produced in Ireland is safer than it was 5 years ago [194].
- Allergens and ingredients labelling were the greatest food safety worry, with over half (53.0 per cent) of businesses listing it as one of their top 3 concerns.
- Food hygiene and handling requirements (for 36.0 per cent of businesses) and carcinogenic chemicals in foods (for 30.0 per cent of businesses) also ranked highly amongst those surveyed.
- There was a strong confidence in food safety measures among the industry. However, around one fifth (18.0 per cent) are calling for more food safety regulation and enforcement.
- Around one third (31.0 per cent) of food businesses did not feel well enough informed about food safety information, despite a high proportion claiming to cover this “in-house” (within the business) or through consultants.

Food safety knowledge, practice and training among food handlers in Ireland

A recent article was published in the journal “Food Control” about food safety knowledge, practice and training among people who work with food in Ireland [195]. The researchers found that

- Knowledge of food safety was higher among those who had a higher level of food safety training, had worked in the industry for longer and had a higher level of job, such as “head chef”.
- Twenty-eight per cent of participants said they have “never” received food safety training.
- Fifty-nine percent of participants had received “Level 3” food safety training.
- Nearly all those who worked in a canteen had food safety training.
- Individuals working in canteens were found to have the highest knowledge score (81.0 per cent) and the highest percentage of “Level 3” training (60.0 per cent).
- When specific questions regarding foodborne pathogens were asked in this study, head chefs, managers and supervisors reported being familiar with *Salmonella* (98.0 per cent), *E. coli* (90.0 per cent) and *Listeria monocytogenes* (71.0 per cent). Similarly, a previous Irish survey reported that head chefs and catering managers were more

familiar with pathogens like *Salmonella* (100.0 per cent) and *E. coli* (98.0 per cent) than *Listeria monocytogenes* (84.0 per cent) [196].

- A relatively high proportion of respondents (93.0 per cent) – similar to the 88.0 per cent previously reported [197] – considered it to be unacceptable for a food handler who is suffering from diarrhoeal illness to handle raw food before cooking. The research also indicated that 7.0 per cent consider this practice acceptable.
- Similarly, 91.0 per cent reported it was unacceptable to prepare ready-to-eat food while suffering with diarrhoea or vomiting, suggesting 9.0 per cent consider this practice acceptable. These findings are notable as, based on these data, almost 1 in 10 respondents surveyed believe that it is an acceptable practice to handle food while unwell.

Rates of zoonoses in Northern Ireland, Ireland, the United Kingdom and the European Union

Data here was obtained from the EU's most recent zoonoses report [198], the Health Protection Surveillance Centre (HPSC) annual epidemiological reports [199], the European Centre for Disease Prevention and Control's annual epidemiological reports [200], and the Public Health Agency (Northern Ireland) data [201].

As can be seen in the data that follows, Northern Ireland-specific data is usually 1 year behind the publication of data in Ireland, the UK and the EU. Aside from this, rates of zoonoses in the respective regions can be directly compared.

In some instances, such as data relating to outbreaks and clusters, only Irish-specific data is presented as there is no available data for Northern Ireland.

Campylobacteriosis

Campylobacteriosis is an acute zoonotic bacterial disease characterised by diarrhoea, abdominal pain, malaise (general discomfort or feeling of illness), fever, nausea and vomiting. It is the most common bacterial cause of gastroenteritis (infection of the gut, stomach or bowels) across the island of Ireland and in Europe.

Risk factors for campylobacteriosis include handling raw poultry or eating raw or undercooked poultry meat. Drinking contaminated untreated water or unpasteurised milk may also spread campylobacteriosis.

Table 11.3 shows the 5-year trends (where data is available) for campylobacteriosis in Ireland, Northern Ireland, the EU total rate and for the UK (including Northern Ireland).

The rate for Ireland has, for the past number of years, been lower than the rate in the UK, Northern Ireland and the EU in general

The rates in the UK are significantly higher than rates for both Ireland and the EU.

Northern Irish rates are higher than those in Ireland and the EU but less than overall UK rates.

Table 11.3: Reported human cases of campylobacteriosis and notification rates per 100,000 population in Northern Ireland, Ireland, the United Kingdom and the European Union from 2014 to 2018 [201,202,203]

Country or geographic area	2014	2015	2016	2017	2018
Northern Ireland	77.0	71.0	68.0	76.0	No data available
Ireland	56.3	52.4	53.1	58.1	63.0
United Kingdom	103.7	92.2	90.1	96.1	98.4
European Union	66.3	63.0	66.4	64.9	64.1

The rate of campylobacteriosis between 2004 and 2018 in Ireland is shown in Table 11.4. As can be seen, there has generally been a slight upward trend, with 2018 seeing the highest rates since 2004. According to the HPSC, this is due to increases in the number of cases reported in the regions defined as “HSE North East” (up by 29.0 per cent), “HSE South” (up by 14.0 per cent) and “HSE East” (up by 15.0 per cent).

Table 11.4: Campylobacteriosis rates per 100,000 population in Ireland from 2004 to 2018 [203]

Year	2004	2005	2006	2007	2008
Campylobacteriosis rates per 100,000 population in Ireland	40.0	41.0	41.5	42.0	40.1
Year	2009	2010	2011	2012	2013
Campylobacteriosis rates per 100,000 population in Ireland	39.0	37.0	52.0	51.0	50.0
Year	2014	2015	2016	2017	2018
Campylobacteriosis rates per 100,000 population in Ireland	52.5	50.0	51.0	58.0	62.0

According to the latest HPSC/HSE “Annual Epidemiological Report on *Campylobacter* infection” (in Ireland), during 2018 there were 5 notified outbreaks of campylobacteriosis:

- Two general outbreaks in long-term care facilities were suspected to be foodborne; 11 people were reported ill between the 2 outbreaks; 3 of the cases were laboratory confirmed.
- An outbreak of 2 laboratory-confirmed cases linked to a hotel were also believed to be foodborne.
- The remaining 2 outbreaks comprised a general travel-related outbreak with 3 confirmed cases and a family outbreak with 3 laboratory-confirmed cases. The transmission route was reported as unknown for both of these outbreaks.

Salmonellosis

Salmonellosis typically presents clinically as an acute enterocolitis (inflammation in the digestive system), with sudden onset of stomach pain, diarrhoea, nausea, headache and occasionally vomiting. Fever is almost always present. Dehydration, especially among vulnerable populations such as infants, the immunocompromised and the elderly, may be severe. Invasive infection, where bacteria spread to other parts of the body, occurs in a proportion of cases.

The common sources of non-typhoidal *Salmonella* are the intestinal tract of domestic and wild animals (including birds), which may result in a variety of foodstuffs, of both animal and plant origin, becoming contaminated with faecal organisms either directly or indirectly. Infected food handlers may also act as a source of contamination for foodstuffs [204].

The overall incidence of salmonellosis in Ireland remains low, compared with other parts of Europe. Table 11.5 shows the rate of salmonellosis cases and notifications per 100,000 of the population in Northern Ireland, Ireland, the EU and the UK. (All UK rates in this report include Northern Ireland; UK rates are not published by region).

The rate of salmonellosis in Ireland and in Northern Ireland was lower than rates for the EU and the UK and has been for the past number of years. Generally, rates in Ireland and Northern Ireland are half the UK rate and almost 3 times lower than the EU rate.

Table 11.5: Reported human cases of salmonellosis and notification rates per 100,000 population in Northern Ireland, Ireland, the United Kingdom and the European Union from 2014 to 2018 [201,202,204]

Country or geographic area	2014	2015	2016	2017	2018
Northern Ireland	6.0	6.7	7.6	6.8	No data

Ireland	5.6	5.8	6.3	7.9	7.3
United Kingdom	12.6	14.6	15.1	15.4	14.3
European Union	20.7	21.0	20.5	19.7	20.1

In Ireland in 2018, there were 363 cases of salmonellosis notified (349 confirmed and 14 probable). The HPSC identified both animal contact and travel as risks for being infected by salmonellosis. According to their annual salmonellosis report, the HPSC reported 58.0 per cent of cases involved contact with pets, wildlife, farm animals or pet food. In addition, 51.0 per cent of cases were associated with travel.

Table 11.6 shows the trends in the annual number of notifications of salmonellosis and crude incidence rate (CIR) per 100,000 in Ireland between 2004 and 2018. The 363 cases notified in 2018 represent a decrease, compared with 2017, of 12.0 per cent. (The Crude Incidence Rate refers to the number of infections per 100,000 of the population).

When only *confirmed* cases are compared, the 349 cases in 2018 represent a decrease on the number in 2017 of 8.0 per cent.

Overall, notifications have increased 40.0 per cent from a low of 260 cases notified in 2014 but remain below levels notified in 2007 to 2008.

Table 11.6: Salmonellosis rates (notifications and crude incidence rates) per 100,000 population in Ireland from 2004 to 2018 [206]

Year	2004	2005	2006	2007	2008
Number of notifications of salmonellosis cases in Ireland	415	345	422	456	449
Crude incidence rates per 100,000 population	10.0	8.0	10.2	11.0	10.9
Year	2009	2010	2011	2012	2013
Number of notifications of salmonellosis cases in Ireland	332	356	310	313	324
Crude incidence rates per 100,000 population	7.2	7.9	6.8	6.8	4.1
Year	2014	2015	2016	2017	2018
Number of notifications of salmonellosis cases in Ireland	260	269	302	414	363
Crude incidence rates per 100,000 population	5.9	6.0	6.2	8.9	7.3

Listeriosis

Listeriosis is an infection caused by the bacterium *Listeria monocytogenes*. Anyone can become ill from eating food contaminated with *Listeria monocytogenes* but the disease affects primarily pregnant women (and their unborn children), new-borns, the elderly, and adults with weakened immune systems [205].

In a healthy adult, the infection is usually without symptoms or causes a mild flu-like illness. In immunocompromised and older adults, the infection can spread through the bloodstream to the central nervous system causing meningitis and/or septicaemia (blood poisoning) with symptoms such as headache, stiff neck, confusion, loss of balance and convulsions. Infected pregnant women may have no symptoms or experience only a mild flu-like illness. However, infection during pregnancy can lead to premature labour, meningitis in the new-born, or miscarriage.

Listeria bacteria are widespread in the environment and can be found in soil and water. Vegetables can become contaminated from the soil or from manure used as fertiliser. Animals can carry the bacterium asymptotically, and meat or dairy products from these animals can be contaminated. Foods may also be contaminated after processing (for example, cheese).

Unlike most bacteria, *Listeria* tends to grow at refrigerated temperatures in foods that have been contaminated. The foods most often associated with infection are ready-to-eat refrigerated and processed foods such as preprepared cooked and chilled meals, soft cheeses, cold cuts of meat, pâtés and smoked fish. Notable recent outbreaks elsewhere have been attributed to frozen corn [206] (in several EU Member States), rock melons [207] (in Australia) and sandwiches [208] (in the UK).

Table 11.7 shows the trends in listeriosis rates in Northern Ireland, Ireland, the UK and the EU. In 2018, the number of reported listeriosis cases was the highest since the disease became notifiable in 2004. All reported cases were in the recognised groups at risk for listeriosis, being elderly, having an underlying illness, or being pregnant or new-born.

As can be seen in Table 11.7, the rate of listeriosis in Northern Ireland has been lower than the EU, UK and Irish rates for the past number of years. In 2017, the crude incidence rate in Northern Ireland (0.1 per 100,000 population) was the lowest it has been in a number of years and significantly lower than the EU, UK and Irish rates.

Table 11.7: Reported cases of human invasive listeriosis and notification rates per 100,000 population in Northern Ireland, Ireland, the United Kingdom and the European Union from 2014 to 2018 [201,202,205]

Country or geographic area	2014	2015	2016	2017	2018
Northern Ireland	0.22	0.32	0.21	0.10	No data
Ireland	0.33	0.41	0.29	0.29	0.43
United Kingdom	0.31	0.29	0.31	0.24	0.25
European Union	0.46	0.43	0.47	0.47	0.47

No outbreaks in listeriosis were reported by HPSC, who note that this suggests a rise in the number of sporadic infections that is particularly noticeable among the elderly. The Listeriosis rates (cases per 100,000 population) in Ireland from 2004 to 2018 in different populations cohorts are shown in Table 11.8.

Table 11.8: Listeriosis rates per 100,000 population in Ireland from 2004 to 2018 [205]

Year	2004	2005	2006	2007	2008
Adult or juvenile	6	10	3	12	9
Neonatal	-	-	1	3	2
Pregnancy related	3	-	1	6	2
Not specified	2	2	1	-	-
Year	2009	2010	2011	2012	2013
Adult or juvenile	9	6	3	7	5
Neonatal	-	1	2	2	3
Pregnancy related	1	4	2	1	-
Not specified	-	-	-	-	-
Year	2014	2015	2016	2017	2018
Adult or juvenile	8	14	10	10	17
Neonatal	3	2	2	2	1

Pregnancy related	4	3	1	2	5
Not specified	-	-	-	-	-

Shiga toxin-producing and verocytotoxin-producing *Escherichia coli*

There are many types of *E. coli*, most of which are harmless and are an important part of a healthy human intestinal tract. However, some types can cause serious illness [209].

The most common transmission routes reported for Shiga toxin-producing *E. coli* (STEC) or verocytotoxin-producing *E. coli* (VTEC) infection in Ireland have been person-to-person spread, especially in childcare facilities and among families with young children, as well as waterborne transmission associated with exposure to water from untreated or poorly treated private water sources [210].

Other important transmission routes identified internationally include food (often minced beef products or fresh produce such as lettuce and spinach) and contact with infected animals or contaminated environments. Symptoms of infection include stomach cramps, diarrhoea, fever and vomiting.

Table 11.9 shows the rates of STEC or VTEC infections and notification rates per 100,000 of the population in Northern Ireland, Ireland, the EU and the UK.

Table 11.9: Reported cases of Shiga toxin-producing or verocytotoxin-producing *Escherichia coli* infections and notification rates per 100,000 population in Northern Ireland, Ireland, the United Kingdom and the European Union from 2014 to 2018 [201,202,212]

Country or geographic area	2014	2015	2016	2017	2018
Northern Ireland	2.90	1.80	1.80	3.00	No data
Ireland	12.42	12.92	15.59	16.62	20.00
United Kingdom	2.06	2.05	2.09	1.51	2.78
European Union	1.75	1.65	1.79	1.64	2.28

As can be seen in Table 11.9, the rates of STEC or VTEC infection have increased between 2014 and 2018 in Ireland and they are consistently and significantly higher than the EU, Northern Ireland and UK rates. For many years, Ireland has had the highest STEC or VTEC notification rate in Europe – with the exception of 2011, when Germany reported the highest rate due to a

large VTEC O104 outbreak linked to fenugreek seeds [211]. In 2017, the rate per 100,000 in Ireland was 16.62, compared with 1.64 in the EU, 2.78 in the UK and 3.0 in Northern Ireland.

Outbreaks for 2017 in Ireland are outlined in Table 11.10.

Thirteen general outbreaks in 2017 resulted in 78 people becoming ill, with 6 being hospitalised.

Of these, 6 occurred in childcare facilities (CCFs); where the route of transmission could be identified, person-to-person spread was identified in 2 small CCF outbreaks.

The largest CCF outbreak resulted in 44 confirmed cases of infection.

Among the remaining 7 general outbreaks, waterborne transmission was reported to have contributed to 2 small community outbreaks (with 2 and 5 people falling ill, respectively) and to a small outbreak at a childminder's home.

Animal contact was suspected in an outbreak of 2 children in a school, person-to-person transmission for 2 further small general outbreaks (2 people at a residential facility and 2 in a private home outbreak), while the transmission route was reported as unknown for a small general outbreak in a private home.

Table 11.10: Shiga toxin-producing or verocytotoxin-producing *Escherichia coli* outbreaks by suspected mode of transmission in Ireland in 2017 [212]

Suspected mode of transmission of Shiga toxin-producing or verocytotoxin-producing <i>Escherichia coli</i> in Ireland in 2017	Number of outbreaks	Number of people who fell ill
Person-to-person	4	6
Waterborne and/or person-to-person	3	8
Animal contact or the environment and/or person-to-person	1	2
Unknown or not specified	5	68
Total	13	84

Note: Data in Table 10.10 does not include reported family outbreaks.

Cryptosporidiosis

Cryptosporidiosis is a diarrhoeal disease caused by the parasite *Cryptosporidium*. It has a worldwide distribution and can be found in soil, food, or water, or on surfaces that have been contaminated with human or animal faeces. It is a common cause of waterborne outbreaks of gastroenteritis (both drinking and recreational waters) [213].

As Table 11.11 shows, for every year between 2013 and 2017, the rates of cryptosporidiosis have been higher in Ireland and Northern Ireland than the EU rate or the UK rate. Ireland has consistently reported the highest CIR of any Member State in the EU since 2012. In addition, when we look at the Northern Irish data separated from UK data, Northern Irish rates are even higher. However, many countries do not have a recording mechanism for this disease.

Table 11.11: Reported cases of cryptosporidiosis and notification rates per 100,000 population in Northern Ireland, Ireland, the United Kingdom and the European Union from 2014 to 2018 [201,202,213]

Country or geographic area	2014	2015	2016	2017	2018
Northern Ireland	8.8	7.8	11.0	15.1	13.5
Ireland	11.2	8.6	9.6	11.8	12.4
United Kingdom	6.3	6.4	9.1	10.3	7.7
European Union	2.3	2.4	3.3	3.8	3.2

Table 11.12 shows the rates of cryptosporidiosis for Ireland. In 2018, 629 cases of cryptosporidiosis were notified, representing a CIR of 13.2 per 100,000 population – a 7.0 per cent increase in the CIR from 2017.

One hundred and ninety-six notified cases were hospitalised (31.0 per cent).

There were no reported deaths.

Table 11.12: Cryptosporidiosis rates (number of notifications and crude incidence rate per 100,000 population) in Ireland from 2004 to 2018 [213]

Year	2004	2005	2006	2007	2008
Number of notifications of cryptosporidiosis in Ireland	425	568	369	608	415
Crude incidence rates per 100,000 population	10.0	13.4	8.7	14.3	9.8
Year	2009	2010	2011	2012	2013
Number of notifications of cryptosporidiosis in Ireland	445	294	428	556	514
Crude incidence rates per 100,000 population	9.7	6.4	9.3	12.1	11.2
Year	2014	2015	2016	2017	2018
Number of notifications of cryptosporidiosis in Ireland	394	439	561	589	629
Crude incidence rates per 100,000 population	8.6	9.6	11.8	12.4	13.2

Consistent with previous years, in 2018 there was a higher incidence in springtime and in young children.

Outbreak and case-based surveillance data suggest that animal contact is an important risk factor for cryptosporidiosis in Ireland.

Exposure to water from non-public supplies also presents a risk of cryptosporidiosis.

Table 11.13 outlines the cryptosporidiosis outbreaks in Ireland in 2018. In total, 19 outbreaks were reported in 2018 (4 general and 15 family outbreaks). The number of outbreaks notified since 2011 has increased. However, this is primarily due to increased recognition of small family outbreaks following the introduction of enhanced surveillance for cryptosporidiosis cases in 2010, and the number of general outbreaks notified has remained stable.

Table 11.13: Cryptosporidiosis outbreaks by suspected mode of transmission in Ireland in 2018 [213]

	Person-to-person	Person-to-person	Waterborne	Waterborne	Animal or environmental contact	Animal or environmental contact	Unknown or not specified	Unknown or not specified	Total	Total
Outbreak location	Number of outbreaks	Number of people who fell ill	Number of outbreaks	Number of people who fell ill	Number of outbreaks	Number of people who fell ill	Number of outbreaks	Number of people who fell ill	Number of outbreaks	Number of people who fell ill
Childcare facility and/or private house	2	18	0	0	0	0	0	0	2	18
Hotel	0	0	1	5	0	0	0	0	1	5
Private house	2	4	2	4	4	4	7	16	15	28
Travel related	0	0	0	0	0	0	1	22	1	22
Total	4	22	3	9	4	4	8	38	19	73

The most common transmission route reported in these outbreaks was by animal contact (4 outbreaks), with 2 waterborne outbreaks and 2 outbreaks due to person-to-person spread also reported.

The transmission route was unknown for the remaining 7 family outbreaks.

Toxoplasmosis

Toxoplasmosis is a disease caused by a common parasite called *Toxoplasma gondii*, which can infect all mammals and birds and is found throughout the world. Up to one billion of the world's human population has become infected with *Toxoplasma*.

Most healthy people who become infected do not experience any symptoms. However, about 10.0 per cent develop a mild flu-like illness.

People living with human immunodeficiency virus (HIV) or acquired immune deficiency syndrome (AIDS) or taking immunosuppressive therapy may be at greater risk of developing disease [214].

Many EU countries do not report data on toxoplasmosis [215]. Data for Ireland is presented in Table 11.14.

During 2018, 32 cases of toxoplasmosis were notified, an increase compared with a mean (average) number of 24 cases notified between 2013 and 2017.

Among the 27 cases where patient type was reported, 56.0 per cent were general practitioner (“GP”) patients and 26.0 per cent attended hospital outpatient services. Cases ranged in age from 9 to 86 years. The median, or mid-range, age for cases was 34.5 years.

No congenital cases (cases present at birth) were reported in 2018.

As in previous years, more cases were reported among females than males. The ratio of cases in males to females was 0.4 to 1.0.

Table 11.14: Reported cases of toxoplasmosis (number of notifications) in Ireland from 2009 to 2018 [214]

Year	Number of toxoplasmosis notifications in Ireland
2009	37
2010	36
2011	32
2012	36
2013	32
2014	20
2015	25
2016	24
2017	20
2018	32

Foodborne illness death rates worldwide

While the WHO's report (2015) notes that foodborne illnesses are a worldwide concern, Africa and South-East Asia regions have the highest incidence and highest death rates [216]. For statistical purposes, the WHO splits their data into a number of regions:

- Eastern Mediterranean Region [216]
- European Region [217]
- Western Pacific Region [218]
- Region of the Americas [219]
- South-East Asia Region [220]
- African Region [221]

Table 11.15 shows the death rate from foodborne disease in the WHO regions.

Table 11.15: Death rates from foodborne disease, according to the World Health Organization, by region [216]

World Health Organization region	Death rate per 100,000 population
Eastern Mediterranean Region	5.57
European Region	0.55
Western Pacific Region	2.65
Region of the Americas	0.90
South-East Asia Region	8.99
African Region	13.4

As can be seen, Africa and South-East Asia experience the highest rates of death from foodborne diseases, while Europe has the lowest rates.

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safefood, 7 Eastgate Avenue,
Eastgate, Little Island,
Co. Cork, T45 RX01

safefood, Ascaill an Gheata Thoir,
An tOileán Beag,
Co. Chorcaí, T45 RX01

safefood, Aistyyett Avenue,
Aistyyett, Wee Isle,
Co. Cork, T45 RX01

