Environmental and Ethical Decision Making in Irish Food Business

Summary

Context

This report was first launched at a workshop entitled 'Environmental and Ethical Decision making in Irish food business' which was held on October 21st 2019 at The Fumbally Stables as part of the EAT:ITH 2019* programme.

The report was commissioned as independent research in order to help navigate through the endless mixed messages that surround ethical and environmental impact today. As conscious business owners we all want to do the right thing, but knowing what 'the right thing' is in terms of environmental impact, is often difficult to determine. The intention of this report is to provide information to help food businesses in making these decisions.

Throughout this document you will find quotes and findings from the workshop highlighted in red, as captured by rapporteur Séan Finnan.

* EAT:ITH is an annual series of workshops, talks and events surrounding food, which takes place in The Fumbally Stables.

Introduction

This is a summary of 'Environmental and Ethical Decision Making in Irish Food Business' by Tom O'Dea. The full report which includes detailed notes and bibliography is available at www.eat-ith.com/report

The report details the significance of certain choices available to food Businesses in terms of their impact on people and environment. The report highlights a number of key findings:

— There are significant differences in the greenhouse gas (GHG) intensity of various plant production methods relating to seasonal and geographical appropriateness, whereas transport distance or "food miles" are generally a relatively poor indicator of total emissions.

— Mixed organics open-field and passive-greenhouse plant production have significantly lower negative impacts across all environmental and social indicators.

— Animal farming is the single biggest negative producer of GHG, biodiversity loss and agricultural pollution both globally and locally.

— In terms of takeaway packaging reuse of containers has a significant potential to lower packaging impact. However, in the use of disposable packaging petro- and bio- plastics have relatively similar negative environmental impact, in each case correct disposal is necessary.

Background — A World in Transformation

The world is currently facing into a series of transformations which will, and have already begun to, alter the shape of life on earth for both humans and non-humans alike. These overlapping and interconnected changes include anthropogenic climate change, an already near catastrophic collapse in plant and animal biodiversity globally and rapidly expanded levels of global wealth inequality.

Each of these effects, all of which have accelerated significantly in the last fifty years, are intrinsically linked to global systems of production, trade and disposal. In human terms, the effects of these changes will be varied and unequally distributed in space, time and dependent on economic factors.

Climate Change

Human activities have significantly altered the global climate through the production of GHGs. In order to mitigate the worst negative effects of climate change a global reduction of emissions to 44% of current levels is required by 2030 with a further reduction to less than 18% by 2050.

Emissions production is unequally distributed, in Ireland emissions stand at approximately 12.65 tCO2e per person per annum (compared to a global average of 6.95 tCO2e) of which agriculture accounts for 33%.

In Ireland an average per capita reduction of 75% of emissions is required to meet a global target emission of 3.12 tCO2e per person by 2030.

Biodiversity and Ecological Collapse

In the last fifty years, humans have caused severe degradation of almost all ecosystems, including the destruction of over 50% of the world's tropical forests, the loss of 85% of global wetlands, the loss of 50% of global coral and an average population decrease of 50% of wild vertebrate species in land, freshwater and sea.

At present approximately 1 million species face extinction within decades.

The primary source of ecosystem loss is agriculture. This is through land-use change, the use of pesticides and fertilisers, the alteration of soil diversity and through wastes and run-offs. Dumping of plastic has a strong negative effect on marine ecosystems.

In Ireland agriculture is a threat in 70% of Irish protected ecosystems of which in 35% it is classified as a high-pressure threat.

Overall 91% of Irish protected habitats are indicated as having bad or inadequate protection for biodiversity. Since 2006 Ireland has begun surveying species abundance, of those species surveyed since 2006 4% are indicated as now being extinct with at least a further 30% of species are threatened.

Inequality and Social Justice

Since the 1980s the world has seen a sharp rise in global wealth and income inequality with the most significant changes being the share of income and wealth change among the top 10% and top 1% of wealth groups, with those on higher incomes contributing to greater levels of environmental destruction. The single biggest indicator for negative impact on climate change is net income.

At the same time global trade in agricultural products has a negative impact on the food security, livelihood and ecosystems of local communities in lower income exporting economies with regular reports of exploitative labour in the production of commodity agricultural products throughout the globe.

The national living wage technical group in Ireland have indicated that a wage of €12.30 per hour for fulltime employment is required to maintain a basic standard of living. However, much of the hospitality and food industry is run on the minimum wage of €9.81 or close to it.

Understanding the Climate Change Impacts of Food Production

Agricultural emissions come from a wide range of sources. In Ireland 67% are accounted for by enteric fermentation and manure management, whilst 30% are accounted for by the application of fertilisers to soil and the associated nitrogen cycle, with only 3% of emissions being accounted for by fuel, transport and other uses.

In a lot of Irish vegetable production the emissions are highly dependent on production methods with heating in greenhouses counting as the most significant contributor (when present).

In most cases transport is a relatively small factor in emissions.

Understanding Waste in Ireland

Municipal waste in Ireland consists of three primary streams: recyclable municipal waste (green waste), municipal waste (black waste) and biodegradable municipal waste (brown waste). In 2016 43% of our waste was directed to recycling, 31% was incinerated and 27% was landfilled. The landfill figure is intended to be reduced to 0% with the introduction of a second national incinerator in Cork.

Municipal waste (black waste) produced in Dublin is incinerated.

In 2016 the restaurant sector accounted for 12% of municipal waste in Ireland, of the waste included in this stream (4%) is accounted for by composites such as coffee cups. These are not currently recycled in Ireland.

To find out more background information read pages 05—09 of the full report.

Methodology

Recognising the complexity of supply chains for food products and the overlapping, but not necessarily dependent, challenges described above, this research uses a five-axis rating system with which to describe the relative impact of food options under the following headings:

– Climate Change
– Ecosystem Use
– Pollution
– Human Impact
– Cost

As this research highlights, choices that create beneficial impacts under one heading can, and often do, produce negative impacts under other headings. It is therefore not possible to simplify findings as being either beneficial or harmful without balancing the range of their impacts across all axes.

To find out more about what is counted in each heading and how the research works read page 21.

Case Study Avocado

Avocados are grown primarily in South and Central America. In Ireland most avocados come from Peru, Chile, South Africa, Mexico, Spain, Kenya and Israel depending on season, crop yield and price.

An average avocado produces 1.71 kgCO2e per kg, or a single serving of half an avocado produces 0.23 kgCO2e.

Avocado production often drives land-use change and deforestation (primarily in forest ecosystems such as Mexico, Colombia, and Brazil) and high water-use (primarily in Peru, Israel, South Africa, Spain and Chile).

In terms of pollution there are high levels of pesticide use in avocado plantations.

In Mexico there is widescale reporting of organised criminality in avocado production. Elsewhere avocado production is typical of agriculture in developing countries with low-wage labour and wealth concentration is a contributor to growing inequality.

Once ever present on café breakfast and brunch menus, recently a number of food businesses have removed avocados from their menus either seasonaly or completely citing environmental and labour concerns.

To read a more detailed comparison of avocado and other foods find out more on page 13 of the full report.

Coffee
In many parts of the world coffee is associated with similar ecosystem, pollution and labour impacts as avocados. In terms of GHG emissions a cup of black coffee or tea has a GHG emission of 0.021 kgCO2e, less than 10% of a serving of avocado. However, a similar sized dairy milk-based coffee such as a latte has a GHG emission of 0.34 kgCO2e, about one and a half times that of an avocado serving.

Other Fruits and Vegetables
Most field grown fruit and vegetables take a lot less energy to produce, about 0.5 kgCO2e/kg or a quarter of avocado. In passively heated greenhouse grown vegetables this goes up to about 1 kgCO2e/kg based (just over half of avocado).

However, the average emission of heated greenhouse grown vegetables was 2.81 kgCO2e/kg, one and a half times an avocado. In particular vegetables such as courgette, cucumber, tomato and lettuce which were commonly produced in heated greenhouses were found to exceed the GHG emission of avocado.

kgCO2e relative to Avocados

0.1	**1 Cup of Black Coffee/Tea** Less than 10% of a serving of avocado
1.5	**1 Dairy Milk-Based Coffee (such as a latte)** About 1.5 times that of an avocado serving
0.25	**Most Fruit & Vegatables** A quarter of a serving of avocado
0.5	**Greenhouse Grown Vegetables** Just over half that of an avocado serving
1.5	**Average Emission of Heated Greenhouse Grown Vegetables (per Kg)** One and a half times of a serving of avocado

An audience member expressed surprise: "You're saying that a cucumber or a courgette grown in a heated greenhouse in Ireland has twice the amount [of emissions], including all of the travel, as an avocado coming from South America?"

— Eat:Ith 2019 Workshop Participant

Eggs, Cheese and Meat
A serving of two eggs produces a GHG of 0.4 kgCO2, just under twice that of a serving of avocado. When compared with cheese and meat there is an even greater greater increase in the amount of emissions, cheese produces 9 kgCO2e/kg (five times that of avocado), UK pork produces 6 kgCO2e/kg (three and a half times avocado), UK lamb produces 26 kgCO2e/kg (fifteen times avocado) and intensively farmed beef produces 26kgCO2e/kg (fifteen times avocado), whereas Irish beef produces up to 40 kgCO2e/kg (twenty four times of avocado) depending on production differences.

kgCO2e relative to Avocados

1.9 — **Two Eggs**
Just under twice that of a serving of avocado

5 — **Cheese**
five times that of avocado

3.5 — **UK Pork**
three and a half times avocado

15 — **UK Lamb**
Fifteen times avocado

15 — **Intensively Farmed Beef**
fifteen times avocado

24 — **Irish Beef**
twenty four times of avocado (depending on production differences)

Non-food context
A return flight from Dublin to London produces 215 kgCO2e. This is equivalent to 934 servings of avocado. A pair of Levi Strauss 501 jeans produces 33.4 kgCO2e, equivalent to 145 serving of avocado.

Servings of Avocados

934 — **Return Flight from Dublin to London**
934 servings of avocado

145 — **Levis 501 Jeans**
145 servings of avocado

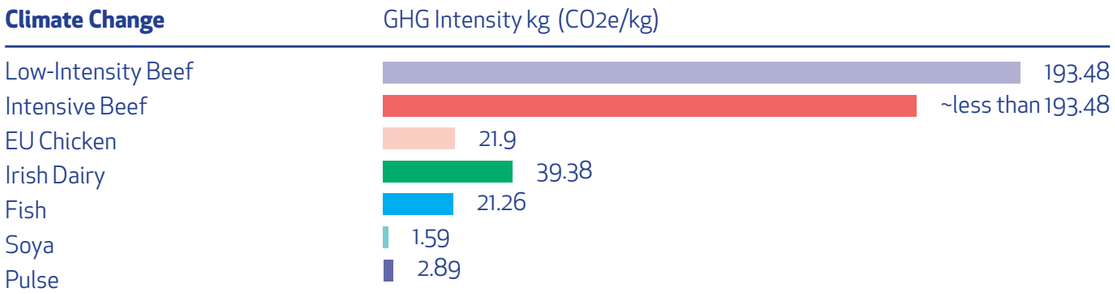
Comparative Analysis Protein

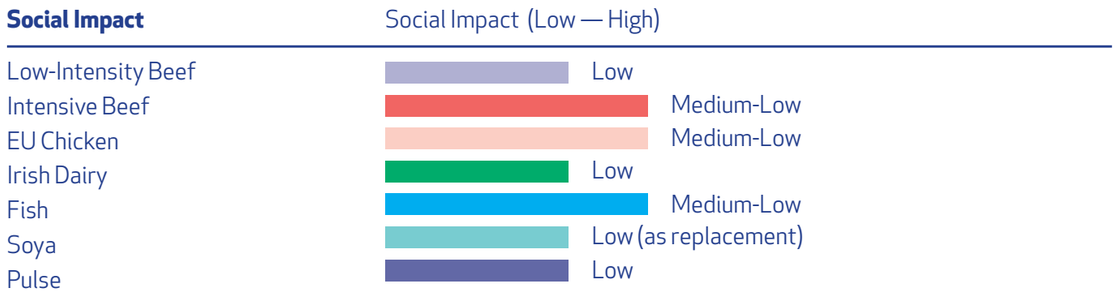
Protein is an essential component required for the growth and maintenance of a healthy body. It is recommended that for an individual of 65kg there is a daily requirement of 54g of protein. Currently protein consumption in Ireland is estimated at 110g per person per day of which only 48% is derived from meat and dairy.

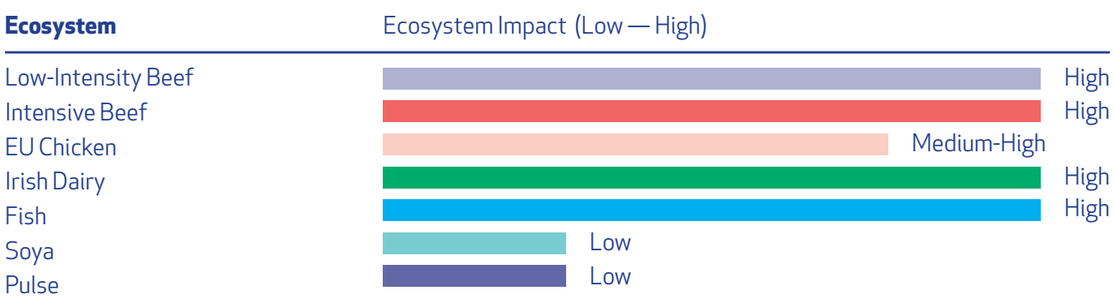
In order to understand the impact of various protein choices available to Irish food businesses this report will examine the impact of the following products: Low-intensity beef production (typical of Irish primarily grass-fed beef production), intensive beef production (typical of European and some Irish beef production), EU chicken production, Irish dairy production, fish production, soya and pulse production.

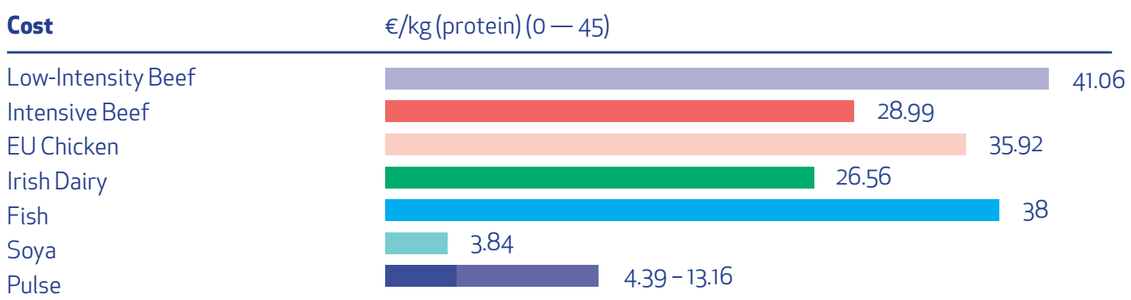
The analysis in this section is presented based on comparison per unit of protein rather than per unit of food product weight.

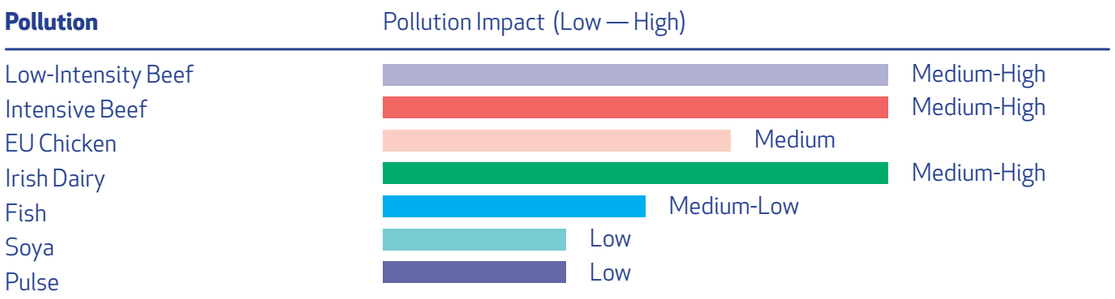
Comparative Analysis
Protein











Summary

There are significant differences between protein choices in terms of each of the main environmental headings.

In particular ruminant animal production has the greatest negative impact in all categories, followed by all other animal food production.

In all areas plant-based foods have significantly lower negative impact.

To read a more detailed comparison of protein choices find out more on page 18 of the full report.

"Make the right choice more desirable. Make the veg option tastier than the non-veg option."

— Eat:Ith 2019 Workshop Participant

Comparative Analysis Tomatoes

Imported Conventional Tomatoes

Tomatoes, similar to most other conventionally grown vegetables, are imported to Ireland through the main trade hubs in the Netherlands. These could be produced in the Netherlands themselves or come from other countries such as (but not exclusively) Spain and Morocco.

In the Netherlands tomato production is characterised by increasingly high tech, hydroponic production in heated greenhouses with the inclusion of technologies such as CO2 reuse enrichment, water and nutrient recirculation and full climate and ventilation control. In Spain production is in hydroponic production in unheated greenhouses with lower inclusion CO2 enrichment from external sources, water and nutrient recirculation and generally little full climate and ventilation control. In Morocco production is generally in unheated greenhouses and is soil based.

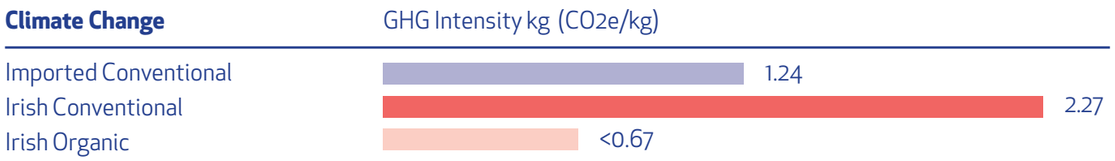
Irish Conventional Tomatoes

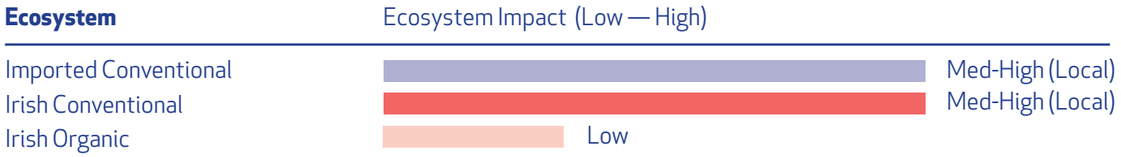
Irish conventional tomatoes are grown primarily in greenhouses in and around North Dublin. Similar to the Netherlands production is highly technical with the inclusion of technologies such as CO2 reuse enrichment, water and nutrient recirculation and full climate and ventilation control powered by electricity and natural gas.

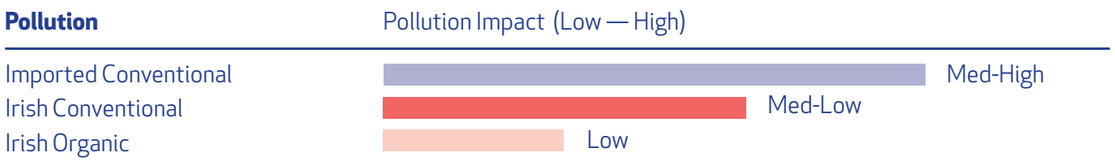
Irish Organic Tomatoes

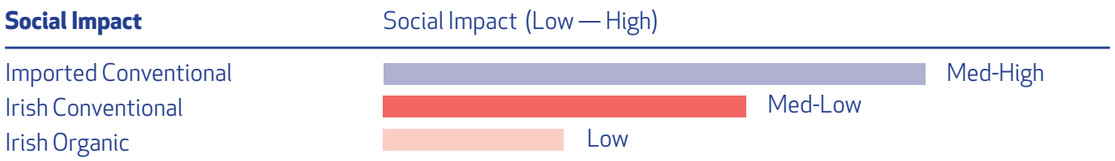
Irish organic tomatoes are grown in smaller quantities than conventional greenhouse tomatoes. Production is seasonal and tomatoes are available in the summer months. Production is soil based, in plastic poly-tunnels and features crop rotation.

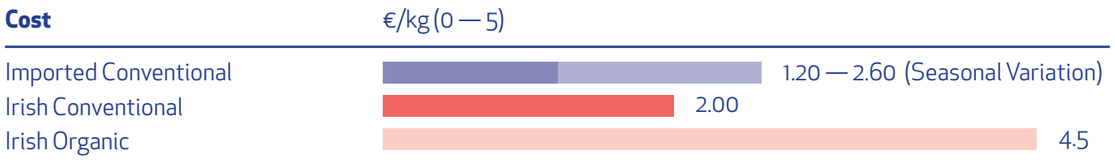
Comparative Analysis
Tomato











Summary

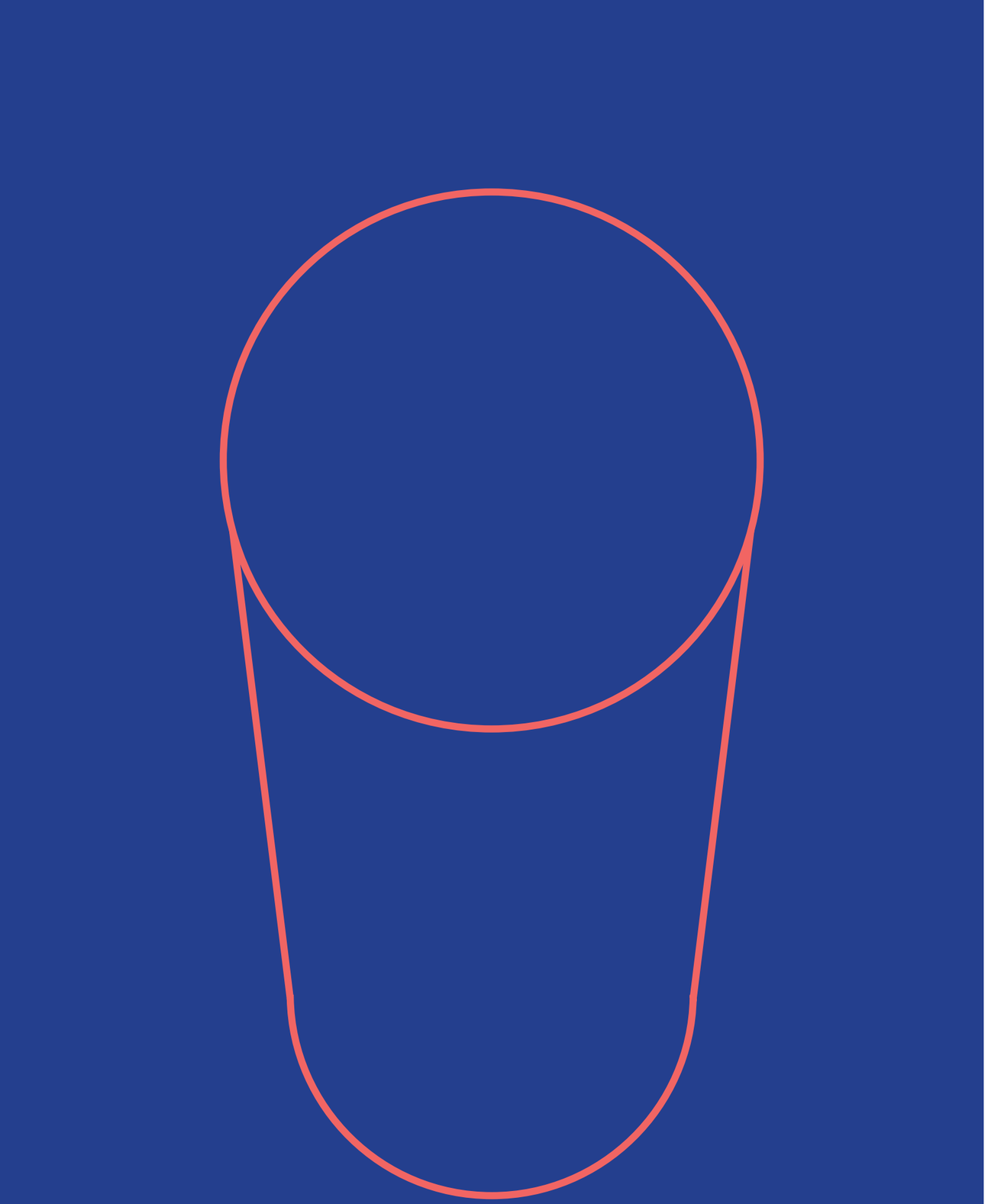
In terms of climate change the most significant factor in tomato production is seasonality and climate suitability, with unheated production having a significantly lower negative impact.

In terms of other environmental impact categories Irish organic production has a significantly lower environmental impact.

In terms of social impact there is enough evidence to suggest that in some countries there are significant negative labour impacts that go beyond legally acceptable levels of wage inequality.

"I think collaborating is really key because that is how we transform the system."
— Eat:Ith 2019 Workshop Participant

To read a more detailed comparison of tomato choices find out more on page 28 of the full report.



Comparative Analysis Packaging

In recent years takeaway packaging has come to form a significant part of the waste stream of some cafes and restaurants. Due to the competing requirements of containing liquids, cost and lightweight construction these have traditionally been manufactured from plastic or composite (paper/plastic) constructions. Whilst plastic recycling is available in Ireland for some plastics within the green waste stream, composite recycling is not.

There is, however, a general misconception about the recyclability of composites and as a result these are disposed of in high proportion in the green waste stream by the general public.

In recent years more biodegradable or compostable alternatives have come to the market most commonly composed of plastics manufactured from plant material and which generally are recyclable and/or biodegradable. However, this is only the case under specific conditions. In Ireland plant-based plastics are not recycled under green waste streams, commercial brown waste streams have facilities for industrial composting and black waste streams are currently incinerated and landfilled.

Comparative Analysis Packaging

Climate Change	GHG Intensity kg (CO2e/kg)
Petroleum Plastic	Medium
Bio Plastic	Medium
Reusable Containers	Low after reuse point

Ecosystem	Ecosystem Impact (Low — High)
Petroleum Plastic	Low
Bio Plastic	Medium-Low
Reusable Containers	Low

Pollution	Pollution Impact (Low — High)
Petroleum Plastic	Medium
Bio Plastic	Medium
Reusable Containers	Low

Social Impact	Social Impact
Petroleum Plastic	n/a
Bio Plastic	n/a
Reusable Containers	n/a

Cost	€/kg (Low — High)
Petroleum Plastic	Medium
Bio Plastic	Medium-High
Reusable Containers	Low

Summary

Given the current situation of waste processing in Ireland there is insignificant differences in all environmental impact between plant and petrochemical derived plastic products.

In all cases reuse of containers represents significantly lower environmental impacts.

"We went all compostable and we thought we were brilliant."
— Eat:Ith 2019 Workshop Participant

To read a more detailed comparison of packaging choices find out more on page 33 of the full report.

"The scale of the change needed to be made is signifigant but it's important to bare in mind what has the most impact. Some changes are more visible than others and oftentimes the invisible change can be more significant."

— **Tom O'Dea**, Eat:Ith 2019 Workshop

Significance of Food Findings

As the research shows there are significant differences in the negative impact of dietary choices on various environmental systems. For example, a daily 150g serving of beef contains 31g of protein and produces 6kg of CO2, whereas a protein equivalent serving of 136g of legumes produces 0.09kg of CO2, a saving of 5.91kg. A change from beef to legumes in a daily meal for one year (365 meals) would produce and equivalent saving of 2,157 kgCO2e. This represents 23% of the overall average emissions reduction required per person in Ireland.

Whilst other changes are required, a similar substitution of the highest to lowest emitting tomatoes yields only a saving of 87.5 kgCO2e. It is therefore important to consider the relative impact of environmental choices in attempting to reduce our overall footprint.

In the case of protein choices that impact positively on climate change also act positively on ecosystem and pollution impacts.

It is important to note that not all choices should be framed solely in terms of negative impact. It is possible to make choices that impact positively on climate change that enhance ecosystems and biodiversity and transform our waste systems.

Agricultural Solutions

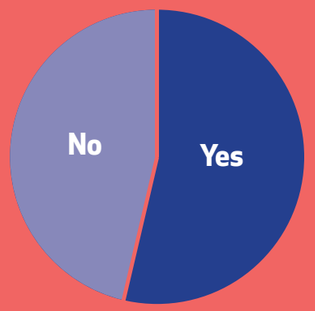
Whilst changes in diet present significant opportunities for reducing negative climate change, ecosystems use and pollution impacts, there is also potential for changes in the practices through which food is produced that can contribute to reducing these negative impacts.

With respect to the negative impact of meat production, agro-ecological farming practices appear to offer some potential benefits. These highly diverse growing practices, sensitive to local conditions, encourage soils to absorb carbon and nitrogen and act as a source of biodiversity. At the same time seasonally appropriate production of crops through intense methods (e.g. passive greenhouse production) also offer potential for high rates of production with minimal land-use and energy impacts. Additionally, experimental techniques are being used to try and reduce the methane emissions of animals through altered feed stocks, however at present the results of these offer fractional savings.

"Acting collectively is very important."

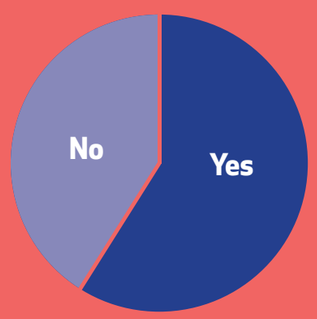
— Eat:Ith 2019 Workshop Participant

These graphs represent a number of questions asked of the participants of the Eat:Ith 2019 Workshop in The Fumbally Stables



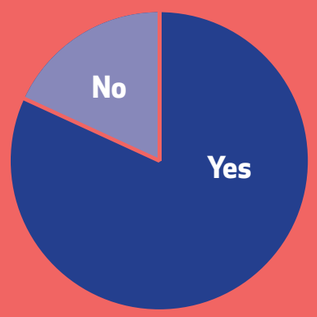
01. Do you feel that you and your business have the power to tackle the issues of climate change in the decisions you take?

Yes	54%
No	46%



02. Do you find it overwhelming to make those decisions?

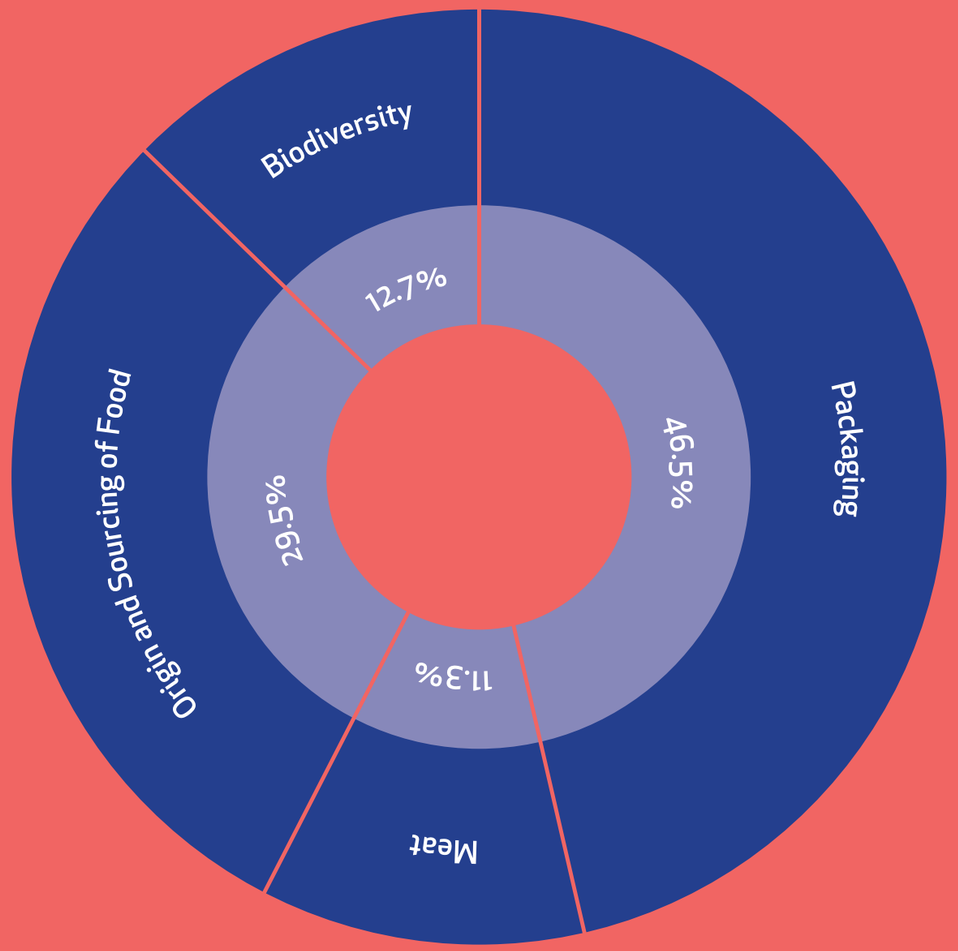
Yes	59%
No	41%



03. Have you made any changes directly related to environmental or ethical impact already?

Yes	82%
No	18%

04. For those who answered 'Yes' to question 03, in what areas have you made those changes?



Research Details

Research carried out by Tom O'Dea, commissioned by The Fumbally, and supported by twenty-eight Irish Food Businesses:

3FE / Airfield House / Ard Bia / Bujo / Bunsen / Camerino / Camille Thai Take Away / Cully & Sully / Donworth Capital / Dublin Food Co-op / Gaillot & Grey / Hotel Doolin / ITSA Group / Little Bird / Loam / Meet Me in the Morning / Network Café / Nobo / Organico / Proper Order / Scéal Bakery / Tang / The Cheese Press / The Farmhouse Café / The Happy Pear / The Hopsack / White Mausu //