Summary Report:

Analysis on the Impact of Future UK FTA Scenarios on Scotland's Agricultural Food and Drink Sector (RESAS/004/21)

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Analysis on the Impact of Future UK FTA Scenarios on Scotland's Agricultural Food and Drink Sector (RESAS/004/21)

Report Produced on Behalf of the Scottish Government by The Andersons Centre

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Executive Summary

This study assesses the impact on Scottish agriculture of Free Trade Agreements (FTAs) between the UK and four selected non-EU partners, namely: Australia; New Zealand (NZ); Canada; and the Gulf Cooperation Council (GCC). It quantifies the FTA impacts on selected Scottish agricultural sectors namely: cereals (wheat and barley); livestock (dairy, beef and sheep); and potatoes. This has been done using two FTA scenarios, Low Liberalisation (tariff-free trade with a 25% reduction in non-tariff measure (NTM) costs) and High Liberalisation (tariff-free trade with a 50% NTM costs' reduction). These scenarios are compared to the Main Baseline whereby the UK has left the EU and the Trade and Cooperation Agreement (TCA) is in place, as are the rollover trade deals that the UK agreed during the Brexit process. Additionally, a top-level comparison was given between the Main Baseline and an Alternative Baseline (No-Brexit) scenario.

The research has been undertaken using a combination of MAGNET, a computable general equilibrium economic model to assess the individual and aggregated impacts of each FTA, as well as desk-based research and industry interviews with 19 experts representing organisations in Scotland and the UK, Australia, New Zealand, Canada and the Gulf region.

Assessments were also undertaken on the impact of tariffs, non-tariff measures (NTMs) and tariff rate quotas (TRQs) on UK trade with each selected partner, as well as the EU. These served as inputs to the MAGNET modelling which was undertaken by Wageningen University and Research (WUR) to assess FTA impacts on wheat, barley, beef, sheepmeat and the dairy sector. These modelling results were then used in conjunction with additional analyses on potatoes to ascertain the impact of the FTAs on UK and Scottish agri-food output and farm-level performance in Scotland.

Overall Results

- **Impact of the selected FTAs is generally limited, but significant in some sectors:** as Table A depicts, the projected long-term impact of the FTAs on Scottish output is relatively small in most cases. The exceptions are sheepmeat, where output is forecast to fall by around 10.5% to 11% under the Low and High Liberalisation scenarios. Beef and wheat are also projected to fall (both by around 3% to 6% depending on the scenario). Conversely, liquid milk output is forecast to grow by 3% to 9% in value terms, indicating significant FTA opportunities for dairy products. Barley is forecast to show a small long-term gain. The input from industry interviews also presents a similar perspective.
- **Cumulative impacts of future FTAs will be more significant:** although the aggregated impact of the selected FTAs is relatively limited, the cumulative effect of multiple trade deals over the longer term should not be underestimated. This is

especially so if the UK agrees FTAs with agricultural powerhouses such as the US and Mercosur (including Brazil and Argentina).

Table A: Projected Long-Term Output of Selected Scottish Agri-Food Sectors by Scenario (£m*)

Sector / Commodity	Main Baseline	Alternative Baseline		FTA Low Liberalisation		FTA High Liberalisation	
	£m	£m	% Ch	£m	% Ch	£m	% Ch
Wheat	108	107	-1.0%	105	-2.7%	101	-5.9%
Barley	249	249	-0.2%	250	0.2%	250	0.3%
Liquid Milk	356	349	-1.9%	366	3.0%	388	9.0%
Beef	568	560	-1.3%	552	-2.8%	533	-6.1%
Sheepmeat	202	205	1.6%	180	-10.5%	179	-11.1%
Sub-Total	**1,482**	**1,470**	**-0.8%**	**1,453**	**-1.9%**	**1,452**	**-2.1%**

Sources: Andersons, WUR and Scottish Government Note: * in real-terms based on 2019 prices

- **FTAs with Australia and NZ are main drivers of declines Scottish sheepmeat output:** whilst NZ has only been partially fulfilling its TRQ in recent years (42Kt exported to UK out of a 114Kt TRQ), the introduction of the new FTA is seen by many as a strong signal for NZ businesses to recapture trade with the UK, which was lost when the UK joined the EEC (NZ exported 221Kt of lamb to the UK in 1972-73). Given the provisions of the UK-NZ FTA and the MAGNET modelling results, it is likely that in the coming years, increased imports from NZ will be catered for via the pre-existing WTO TRQ. Australia will also be keen to increase sheepmeat exports to the UK. Whilst both Australia and NZ are heavily focused on Asia, if geopolitics changes the trading relationships with China, it is likely that additional volumes of antipodean sheepmeat will be exported to the UK.
- **Beef sector will come under notable pressure but some opportunities also exist:** whilst imports from Australia and NZ will exert significant pressure, a trade deal with Canada is likely to generate some export opportunities. Given the brand recognition of Scotch beef, it should be relatively well-positioned to exploit such niches. That said, safeguarding domestic sales, particularly to UK retailers, from overseas competitors will remain most crucial.
- **The FTAs with Australia and NZ set important precedents:** the recently agreed FTAs with Australia and NZ give important signals to trade negotiators elsewhere as to what the UK is willing to cede in trade negotiations. Therefore, the standards that the UK is willing to accept for imports is pivotal, especially as other FTA partners will likely push for more concessions during negotiations. Any significant changes to standards relating to food safety and hygiene, the environment and

animal welfare will have major implications for Scottish produce. This is not just on the home market, but overseas as well, especially in terms of highly-renowned brands such as Scotch Beef.

- **FTA opportunities for dairying driven by the GCC:** of the commodities assessed, the dairy sector is best positioned to see export growth, particularly to the GCC, where Scottish dairy produce has already gained traction in high-end segments. UK exports to GCC in 2018-20 are valued at £38m and could rise by as much as 49% in a High Liberalisation scenario. Opportunities theoretically exist to export to Canada, but, as it is highly protectionist, sales are likely to be limited to select niches.
- **Long-term impact of Brexit is deemed to be limited:** Table A also shows relatively small differences in output under the Main Baseline (incorporating Brexit) and the Alternative Baseline (No-Brexit scenario). Although seed potatoes were not modelled using MAGNET, the loss of the EU and NI markets for Scottish seed potato exports is significant and the restoration of this market access is a key goal for the sector. It should also be a primary objective for policy-makers.

Farm-Level Results

Table B shows the profitability impacts of the FTA scenarios and the Main Baseline against the 2019/20 Base Year, using Scottish Farm Business Income (FBI) data. This has been done via a static subtraction from the FBI results comparing Main Baseline and FTA scenarios with the Base Year. Importantly, the production-related FTA impacts have not been modelled at the farm-level and support is held constant.

- **Significant FBI declines:** in both the Main Baseline and FTA Scenarios in comparison with the Base Year (2019/20) although the differences between the Main Baseline and FTA scenarios are quite small. This is chiefly linked with declining prices resulting from a continuation of the long-term trend towards increased productivity in a perfect competition environment (i.e. farmers as price takers).
    - **Price declines are the major driver:** milk prices are forecast to decline by 5.7% versus the Base Year. Cattle and sheep prices are projected to reduce by 4.1% and 3.6% respectively whilst cereal price declines are in the region of 3.2% to 3.4%.
    - **Brexit only plays a minor role:** in any FBI differences between the Main Baseline and 2019/20.
    - **Without support, farms will generate losses on average:** In some cases (e.g. Lowland Cattle & Sheep), FBI declines almost equate to the levels of support that these farms received during 2019/20. In all instances, the long-

term margin from agricultural production is projected to be negative. Thus underscoring the crucial role that support will play in sustaining farm incomes.

Table B: Impact of FTA Scenarios on Farm Business Income Excluding Diversification

Sector	19/20 (Base)	Main Baseline	% Ch.	FTA Low Lib	% Ch.	FTA High Lib	% Ch.
Cereals	32,100	24,800	-23%	23,900	-25%	23,300	-27%
Dairy	59,500	23,600	-60%	23,800	-60%	24,800	-58%
LFA Cattle & Sheep	23,500	19,600	-17%	19,400	-18%	19,300	-18%
Lowland Cattle & Sheep	10,600	4,800	-55%	4,700	-56%	4,500	-57%

Sources: Scottish Farm Business Survey, Andersons
Note: Figures are rounded to the nearest £100

- **New FTAs to have negligible impact on potatoes:** industry input suggests that the new FTAs will have minimal impact on seed potatoes' profitability. Instead, the impact of the loss of the EU market for Scottish seed potatoes is estimated to have led to a decline in seed potato prices of approximately 4%. Restoring market access to the EU27 and Northern Ireland is a priority for the sector.

Other Key Findings

- **Evidence Review shows that NTM arrangements and geographic proximity are crucial:** in determining the degree of impact resulting from any FTA and are just as important as tariffs and TRQs. This generally chimes well with the key findings from this study.
- **NTM ad-valorem equivalents (AVEs) are less than 10% for the selected commodities and FTA partners:** As Table C shows for UK imports, they are highest for potatoes, ranging from 2.7% to 7.2% for imports into the UK. For meat and dairy product imports, NTM AVEs range from just over 1% to 6%. NTM AVEs for wheat and barley are negligible. NTM costs are lowest for NZ as it has a veterinary agreement with the UK and its prices are generally higher. Table D shows that the NTM AVEs for imports into selected partner countries are broadly similar to the AVEs for imports into the UK.

Table C: Estimated NTM AVEs on Imports into the UK from EU27 and Selected Non-EU Partners

Commodity	EU27	Australia	NZ	Canada	GCC
Wheat	0.1%	0.2%	0.1%	0.1%	0.1%
Barley	0.1%	0.2%	0.1%	0.1%	0.1%
Dairy products	2.0%	2.7%	1.4%	1.2%	2.5%
Beef	1.8%	2.6%	1.6%	1.5%	4.7%
Sheepmeat	2.3%	2.9%	1.3%	0.9%	5.9%
Potatoes	4.5%	6.0%	2.7%	4.6%	7.2%

Source: The Andersons Centre

Table D: Estimated NTM AVEs on Exports from the UK to EU27 and Selected Non-EU Partners

Commodity	EU27	Australia	NZ	Canada	GCC
Wheat	0.1%	0.1%	0.1%	0.1%	0.1%
Barley	0.1%	0.1%	0.1%	0.1%	0.1%
Dairy products	2.2%	2.8%	1.8%	1.3%	2.5%
Beef	2.1%	6.5%	3.1%	2.6%	7.2%
Sheepmeat	1.9%	249%	2.7%	2.3%	5.5%
Potatoes	7.1%	7.2%	5.7%	5.3%	8.4%

Source: The Andersons Centre

- **Impact of selected FTAs on wages is projected to be minimal:** in the High Liberalisation scenario, wages are projected to be just 0.8% higher for cereals and 0.2% higher for dairy and red meat. Of more significance, was the ending of Free Movement, which contributed to significant increases in labour costs (7.5% for full-time and 15% for part-time / casual). This impact is most pronounced in meat processing; however, it is in horticulture (not within scope) where there are most difficulties.
- **FTAs' effects on employment are linked with GVA impacts:** employment in the sheepmeat sector is projected to decline by around 11%. Declines in the wheat and beef sectors are projected at 3% to 6% in the Low and High Liberalisation scenarios respectively. Conversely, dairy sector employment could rise by 9% in the High Liberalisation scenario (3% in Low Liberalisation). Minimal change is forecast for barley but influence of demand for whisky will be important here.
- **Short-term impacts of Brexit are more pronounced on UK exports to the EU:** in comparison with imports in the opposite direction. This is because the UK Border Operating Model for controlling imports will not become fully functional until the end of 2023. Conversely, UK exports to the EU have been subject to

border controls and checks since January 2021. Furthermore, the impact of regulatory controls on UK-EU trade has had a more substantial impact on small and micro enterprises. These businesses have ceased trading with the EU in many cases. Therefore, whilst overall trade might not be that affected, this trade is now in the hands of larger traders to a much greater extent.

- **Long-term impacts of Covid-19 deemed to be limited:** undoubtedly, the Covid-19 pandemic has had a major economic impact during 2020 and 2021. However, its effect on agri-food was relatively limited. Although Covid-related labour cost and supply-chain issues are anticipated to linger for some time, they are not expected to have a major long-term impact. Most industry experts believe that the Russia-Ukraine conflict will have a more telling impact on the global agri-food industry.
- **Land-use change pressures will be highly influential:** industry feedback suggests that whilst trade-related pressures will be significant for grazing livestock, other long-term pressures will also feature prominently. In particular, the pressure (incentive) for land-use change arising from poor profitability in grazing livestock as well as societal needs to offset greenhouse gas emissions will heavily influence the future size and structure of the industry. This is especially so in Scotland where tree-planting has already led to declines in sheep populations. This trend is expected to continue.
- **Scottish produce is internationally renowned and its reputation can be leveraged:** Both domestics and overseas industry interviewees suggest exploiting the brand reputation of Scotch beef, whisky and salmon in overseas markets. UK-based interviewees believe that this reputation needs to be leveraged into other sectors, especially lamb and dairy products.

Final Remarks

The Scottish agri-food and farming industry has entered a "Decade of Disruption" and is grappling with multiple challenges arising from inflation, policy reform, structural challenges, GHG emissions in addition to the prospect of new FTAs. Whilst the onus is ultimately on the industry to adapt to such pressures, it is incumbent on policy-makers to assist where possible in managing the transition ahead.

Environmental concerns have become a central consumer issue. This calls for a compelling value proposition for Scottish agri-food produce that is high-quality and "Eco-friendly". This would help to safeguard the position of Scottish produce domestically and serve as a flagship to capture overseas sales.

Change has always been a feature of farming which has come through multiple crises in the past. The Covid-19 pandemic, Brexit and the Russia-Ukraine conflict have created new challenges. But, these crises have also shown the importance of robust,

secure and high-integrity supply-chains. Given the strong international reputation of Scottish food and drink, whilst the new FTAs will bring challenges, there are also opportunities, provided that there is a level playing field for all.

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1. Introduction

1.1 Background

With the Transition Period ending in December 2020, and following the UK's departure from the EU, the Westminster Government has embarked on agreeing trade deals with non-EU countries. UK-EU trading arrangements have also seen their most significant change since the 1970's with the introduction of the Trade and Cooperation Agreement (TCA) in January 2021. Accordingly, Scottish agriculture is now operating in a trading environment that has already altered significantly, with further change ahead.

It is against this backdrop that the Scottish Government commissioned The Andersons Centre (Andersons) and Wageningen University and Research (WUR) to assess the impact of four Free Trade Agreements (FTAs), namely Australia, New Zealand (NZ), Canada, and the Gulf Cooperation Council (GCC). Two of these (Australia and New Zealand) have already been agreed and will be ratified in the coming months. An enhanced FTA between the UK and Canada is anticipated during 2022 whilst negotiations have started on a future FTA with the GCC.

Given these changes, it is an appropriate time to assess the impact of future FTAs on Scottish farming.

1.2 Project Aim and Objectives

The project's aim is to quantify the impact of alternative trade scenarios versus the main baseline of a UK-EU trade deal coupled with Rollover Agreements replicating the provisions of trade deals that the UK had access to when it was an EU Member State. This studies the impact on the Scottish agri-food sector with respect to the four selected UK FTAs. These scenarios are set-out in section 1.3.

To achieve this overall aim, the following objectives were also set:

1. Conduct an evidence review of studies assessing the impact of trade deals on agriculture, including the UK (Scotland), the EU & other key players.
2. Quantify the impact of four selected FTAs on each selected sub-sector with respect to Tariffs, Tariff Rate Quotas (TRQs), Non-Tariff Measures (NTMs), and the overall trade impact.
3. Quantify the impact of the FTAs on economic output and wages and employment in each selected agricultural sub-sector sector in the UK and Scotland for the scenarios selected.
4. Analyse the impact of other economic shocks (Covid-19) under each scenario.
5. Assess the implications for the Scottish agricultural industry at both a sectoral and farm-level, particularly in terms of profitability.

1.3 Scenarios and Scope

The baseline and other scenarios are set out as follows, with further detail in section 2.2;

- **Main Baseline - Brexit - UK-EU FTA (and rollover FTAs):** to reflect the reality that Brexit has occurred, the Main Baseline assumes that the Trade and Cooperation Agreement (TCA) between the UK and the EU is effective. It assumes that the provisions of trade deals that were applicable to the UK when it was an EU Member State are also in place (via Rollover trade deals). This reflects the situation as at December 2021 when the project commenced.
- **Alternative Baseline (No-Brexit Scenario):** the base period for this study is 2018-2020, when the UK was either still an EU Member State or had entered into the Transition Period (i.e., was still a de-facto EU Member State). To reflect this, and the Scottish Government's request for top-level insights on how the Scottish agriculture sector might have performed if there was no Brexit, this Alternative Baseline was assessed primarily in terms of impact on Gross Value Added (GVA).
- **Brexit with Rest of World (RoW) FTAs and Low Liberalisation (FTAs with Low Liberalisation):** this effectively means the Main Baseline plus the impact of each new FTA between the UK and each country/trade bloc specified. For Canada, this is taken to mean an enhanced FTA that goes beyond the rollover trade deal that the UK struck with Canada before the Transition Period ended (i.e., which largely replicated CETA). The Low Liberalisation ('Low Lib') aspect means that, long-term, there are zero-tariffs on trade between the UK and each non-EU FTA partner as well a 25% decrease in Non-Tariff Measure (NTM) costs.
- **Brexit, Non-EU FTAs and High Liberalisation (FTAs with High Liberalisation):** this scenario is largely the same as the previous one, but NTM costs are reduced by 50% in the long-term.

For each FTA liberalisation scenario, the impacts of the FTAs will be assessed for each selected country/trade bloc (partner) individually as well as at an aggregated level.

The FTA partners selected for examination are;

- **Australia:** based on the recently agreed FTA
- **New Zealand (NZ):** again, based on the recently agreed FTA
- **Canada:** focuses on an enhanced FTA that includes full-tariff reduction (long-term) for UK imports.

- **Gulf Cooperation Council (GCC):** encompassing Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates (UAE). Again, assumes full long-term tariff reductions.

As requested by the Scottish Government, this study focuses on the following agricultural sub-sectors;

- **Beef**
- **Sheep**
- **Dairy**
- **Wheat**
- **Barley**
- **Potatoes:** encompassing both seed and ware potatoes.

1.4 Geographic Definitions

Throughout this report, there are numerous geographical terms which are sometimes used interchangeably. It is, therefore, important to define these terms at the outset:

- **United Kingdom (UK):** includes England, Scotland, Wales, and Northern Ireland (NI).
- **Great Britain (GB):** consists of England, Scotland, and Wales.
- **Ireland:** refers to the Republic of Ireland and is part of the EU27.
- **Island of Ireland:** includes both Northern Ireland and the Republic of Ireland.
- **The European Union (EU):** consists of 27 EU Member States (excluding UK); often cited as EU27.
- **EU28:** includes the EU27 and the UK when it was an EU Member State.
- **Non-EU:** all countries outside of the EU27 and the UK; periodically referred to as Rest of World (RoW) or "third countries".
- **Gulf Cooperation Council (GCC):** trade bloc which includes Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates (UAE).
- **Mercosur:** an economic and political bloc consisting of Argentina, Brazil, Paraguay, and Uruguay.
- **Comprehensive and Progressive Trans-Pacific Partnership (CPTPP):** a trade agreement among 11 countries namely, Australia, Brunei, Canada, Chile, Japan, Malaysia, Mexico, New Zealand, Peru, Singapore, and Vietnam.

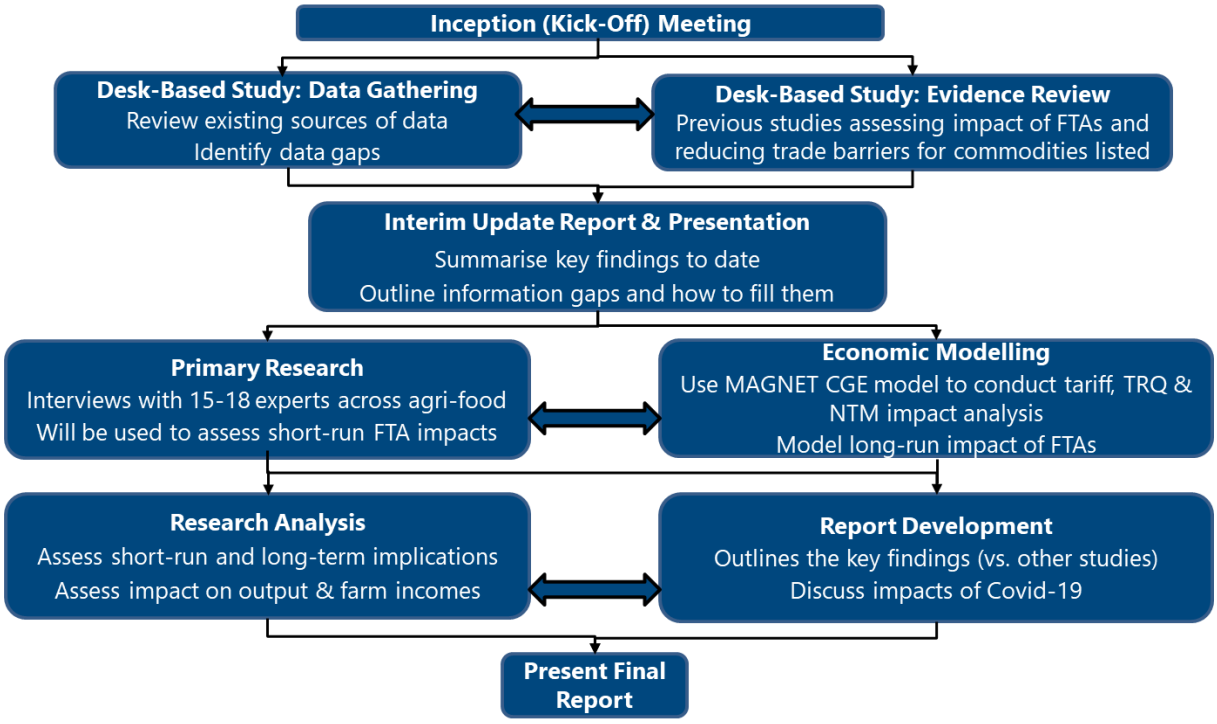
2. Methodology

2.1 General

Figure 2-1 summarises the overall methodological approach. It consists of a combination of desk-based and primary research followed by economic modelling using a combination of the MAGNET Computable General Equilibrium (CGE) model

and MS-Excel based analysis. Section 2.2 outlines the methodological steps in further detail with supplementary information contained in Annex I.

Figure 2-1: Summary of the Methodological Approach Undertaken in this Study



Source: Andersons and Wageningen University and Research (WUR)

2.2 Methodological Steps

1. **Inception Meeting**: Andersons, WUR and the Project Steering Group clarified, at the outset, the project's priorities, timelines, datasets and other resources which could help the study.
2. **Desk-Based Study:** this stage consisted of two strands;
   a) **Data Gathering:** upon project commencement, numerous data sources were identified. Some were under the auspices of RESAS and the Scottish Government. Several other data sources were also used to fulfil the project's objectives. These sources included;
      - **UK-based sources:** in addition to the Scottish Government, particularly RESAS, data from various other UK-based governmental organisations such as Defra, Department for International Trade, and the HMRC were deployed during this study. Additional data was also obtained from Levy Boards, trade associations, the National Farmers' Union Scotland (NFUS), and others.
      - **Sources in selected non-EU countries:** data from overseas governmental organisations encompassing The Government of Canada (Canadian Government), the New Zealand Government, the Australian

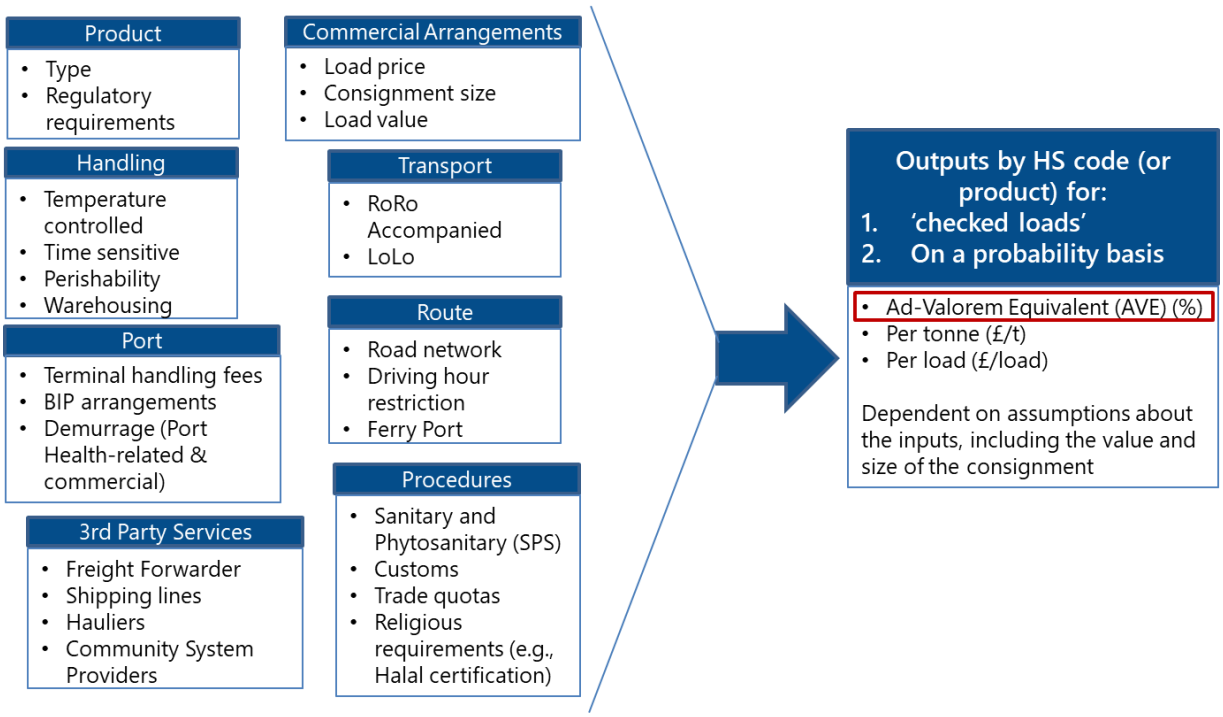
Government, the Saudi Arabian Government, and the UAE Government were also consulted. Data from trade associations representing businesses in these countries was also consulted.

- **Other overseas sources:** such as the EU Commission, EUROSTAT, WTO, OECD, UN FAO, UN Comtrade, and the USDA.

In addition, further data sources associated with the MAGNET model framework (see Step 5) were utilised. Additional data sources managed by Andersons were also made available, such as;

- **Andersons' NTMs Model:** uses 25-30 cost sub-categories to assess NTMs' costs on UK agri-food trade. Andersons NTMs model was originally developed based on UK-EU trade as well as generic third country trade entering the UK. The model was updated for this study and expanded to include the countries/blocs within scope. It assesses NTMs costs on both a "checked load" (subject to the full range of regulatory checks) and on a probabilistic basis (i.e. averaged over 100 loads to account for checking rates etc.).

Figure 2-2: Structure of The Andersons Centre's NTMs Model



Source: The Andersons Centre

Note: NTMs costs in this study are primarily expressed in AVE terms.

- **ABC Books:** 90th edition data was used to assess the farm-level impacts of new FTAs on the potatoes sector (Chapter 7).

b) **Evidence Review:** was undertaken in the early stages of the study. It identified and examined what overlapping or supporting work was undertaken in recent years, thus preventing a repetition of effort and resources. It looks at the impact of FTAs on UK and Scottish agriculture as well as the impact of other trade deals of relevance to this study. It also examines key issues such as tariffs, tariff rate quotas (TRQs), non-tariff measures (NTMs) and labour. Given that most of the previous studies have been undertaken at a UK-level, this was also the main focus of the Evidence Review. However, where possible, Scottish-level effects, particularly at the farm level were also assessed. Chapter 3 summarises the key findings. Annex II contains the full Evidence Review. It serves as a useful backdrop and grounding for most of the chapters in the report.

The inputs from both the Data Gathering and Evidence Review stages were used to establish the baseline situation for UK and Scottish agriculture in terms of output and sales by geographic market. It uses 2018-20 as the base period (Base). This is because at the time of compiling this part of the study (December 2021 to February 2022), it was the latest period for which full-year data were available. Whilst the Covid-19 pandemic did skew the results somewhat for 2020, these effects were minimised by averaging over a three-year period. Also, as the Covid Crisis is anticipated to lead to some long-term changes in supply-chains (e.g. increased online ordering), it is important that these effects are also reflected.

3 **Interim Report Update**: was submitted upon completion of the Evidence Review. It set-out the key initial findings and how remaining knowledge gaps would be addressed.

4 **Primary Research:** collected evidence from industry experts to ascertain the specific impacts of each FTA on the Scottish agricultural sectors selected for examination. This helped to provide a greater Scottish context to the economic modelling. In total, 19 in-depth discussions (circa 30-45 minutes' duration) took place with a variety of stakeholders as summarised in

5 Table 2-1. Additional shorter discussions on specific points were also held with several industry participants. Some participants also provided supplementary information which helped to further expand the data gathered over the course of the study.

Table 2-1 – Summary of Primary Research Interviews Undertaken

Sector	No. of Interviews	Stakeholder Type
Beef and sheep	5	Includes 2 processors & 3 trade bodies / farming associations
Dairy	3	2 processors, 1 trade body
Cereals	3	1 trade body, 2 traders/suppliers
Potatoes	2	1 grower/supplier and 1 specialist industry expert
Overseas input	4	3 trade bodies and 1 governmental organisation
Other / general	2	2 international trade experts
Total	**19**	

Source: The Andersons Centre

Notes: Some discussions, particularly with overseas experts, spanned multiple sectors. In addition, some discussions also had multiple participants.

6 **Economic Modelling:** combined global CGE modelling (using MAGNET) and MS Excel-based analyses to quantify the impact of Brexit and the FTAs within scope at a UK sectoral level (i.e. effects on Gross Value Added (GVA), impacts on supply, demand, prices and trade). Subsequently, additional Excel analysis was run on a Scottish farm-level to ascertain the potential impacts of the FTAs on Scottish agri-food and farming (see Chapter 8). Below is a top-level overview of the sub-steps used with additional detail provided in Annex I.

- **The MAGNET model:** is based on neo-classical microeconomic theory and builds upon the widely used Global Trade Analysis Project (GTAP) database. As a CGE model, it has economy-wide coverage and is a dynamic, multi-regional, multi-commodity CGE model, covering the entire global economy. This includes 18 agri-food commodities and 9 food processing sectors as well as a wide selection of non-agricultural commodities.

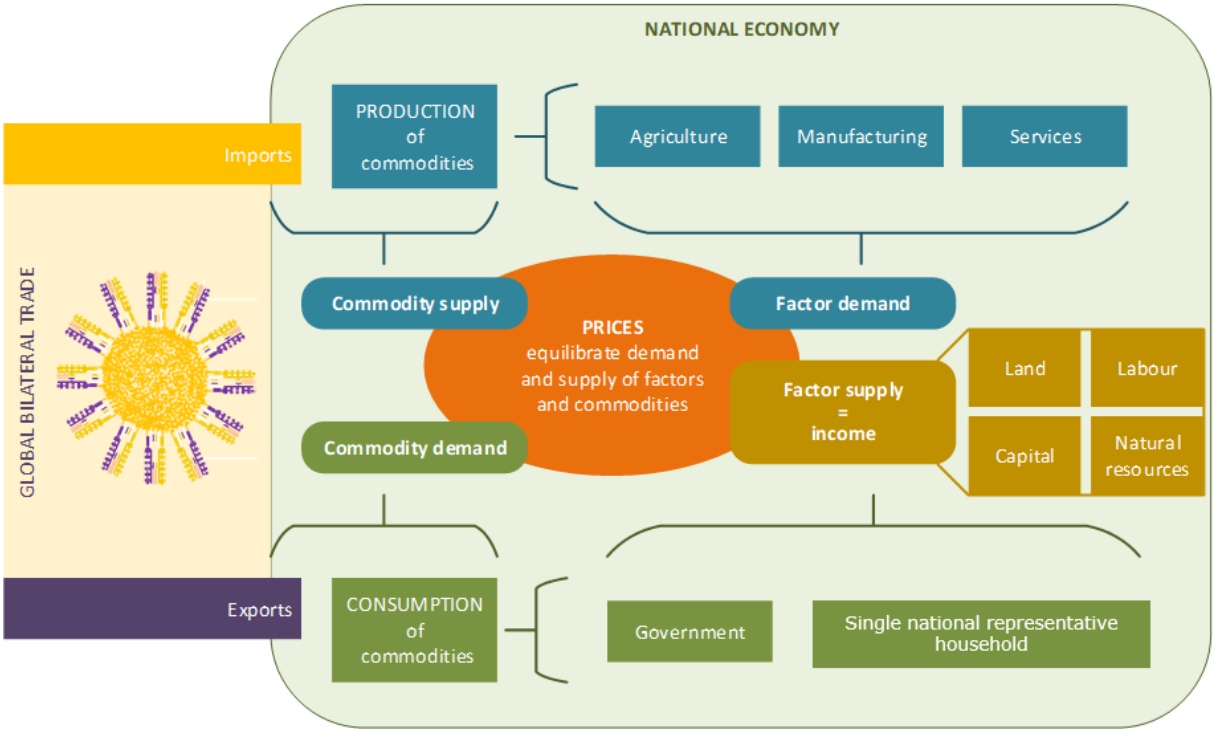
  As a global model it covers all regions of the world. For this project, individual MAGNET regions were aggregated into 14 blocks, but the focus countries – the UK, Australia, New Zealand, Canada, GCC countries were kept disaggregated.

  Being neo-classical, prices adjust to balance supply and demand in all markets for commodities and factors of production (like land and labour), while still allowing the imposition of production or trade quotas in addition to price-based policies (taxes, subsidies, etc.). Figure 2-3 depicts

the circular flow of commodities and key factors underpinning the MAGNET CGE model. Market adjustments in MAGNET are driven by the following factors;

i. the policies in place
ii. commodity supply resulting from price-taking and cost-minimizing producers (one producer per sector)
iii. commodity demand from a utility maximising household (one per country/region);
iv. feedback link between demand for factors by producers which affects their price and thus available income of the household
v. adjustments in all bilateral international commodity trade (products are differentiated by origin)

Figure 2-3: Conceptual Overview of the MAGNET CGE Model



MAGNET has an extensive scientific track record among which foresight and policy studies in;

- food security (Doelman et al. 2019[1]; van Meijl et al. 2020[2]; Brinkman et al. 2020[3])
- food system interventions (Kuiper and Cui 2020; Latka et al. 2021),
- SDGs achievement under different development pathways (Philippidis et al. 2020[4]), and

- Contributions to large multi-model integrated sustainability assessments (Leclère et al. 2020[5]; Stehfest et al. 2019[6]; Frank et al. 2019[7]; Fujimori et al. 2019[8]).

Through commissioned studies MAGNET serves as a decision support tool for the European Union and national governments. It has been used by the European Commission, OECD, IFAD and others. Recently MAGNET has been applied in a study for the European Parliament to assess the impact of Brexit in Fisheries (Bartelings and Smeets Kristkova, 2022[9]).

The key datasets underpinning the MAGNET modelling for this study are;

- **GTAP dataset:** the GTAP dataset forms the core of the GTAP-MAGNET database. It is a fully documented, publicly available global database containing complete bilateral trade information, transport and protection linkages (all represented in dollar values). The current V10 GTAP dataset represents the world economy in 2014 and is utilised by thousands worldwide as a key input into most CGE analyses of global economic issues. An overview is documented in the Journal of Global Economic Analysis in November 2019.[10] This study used version 10.1 of the dataset; an interim release available to GTAP advisory board members where the representation of agricultural production is better aligned with the FAO production data than the public version. For computational reasons, all GTAP-based CGES, including MAGNET, use an aggregation of the GTAP database with a limited number of regions and sectors.
- **Additional key data sources:** MAGNET's ability for analysing agri-food trade is enhanced by splitting several standard GTAP sectors into MAGNET-specific sectors. These splits rely mostly on the regularly updated global database on agricultural production from the FAO, which contain the production and price data needed to compute production in Dollar values compatible with the GTAP database. Details on trade (value flows and protection levels in ad-valorem equivalents), aside from the products within the scope of this study, are obtained from BACI[11] and TASTE,[12] which provide the bilateral harmonized and balanced data needed for a CGE model database.

  There are two important sectoral classifications (or splits) for this project which are worth noting. Firstly, is the split of the GTAP sector called "Bovine cattle, sheep and goats, horses". This has been split by separating "Bovine cattle" and "other ruminant livestock" which are mainly sheep in the case of Scotland/UK. In addition, MAGNET does

not model barley specifically, but instead it is subsumed within the "other grain" sector. For the UK, other grain chiefly relates to barley and, therefore, it was decided to use this category as a proxy for barley in the modelling.

- **CGE modelling calibration for scenario-based analysis:** considering the scenarios outlined in Chapter 1 and how the MAGNET model is structured, calibrations were required in the CGE modelling to facilitate the long-term analysis of each scenario. These calibrations are summarised in Table 2-2 below. As the latest version of the GTAP dataset runs to 2014, WUR updated the inputs needed for the MAGNET model used in this study to 2019 – the latest year for which the complete data (including both UK and other global inputs) is available.

Table 2-2: Overview of Baselines and Scenarios used in CGE Modelling

Scenario Name	Description
Main Baseline (Incorporating Brexit) (2014-2037)	Incorporate Trade measures based on historical evidence (2014-2019) and Incorporate Brexit trade and labour shocks (2019-2037)
Alternative Baseline (No-Brexit) (2014-2037)	Incorporate Trade measures based on historical evidence, but Brexit-related trade and labour shocks are not incorporated.
FTA Low Liberalisation (Low Lib) (Comparative Static 2037)	25% decrease of NTMs for the focus countries, zero import tariffs (FTAs assumption)
FTA High Liberalisation (High Lib) (Comparative Static 2037)	50% decrease of NTMs for the focus countries, zero import tariffs (FTAs assumption)

Sources: WUR and The Andersons Centre

From there, estimates needed to be compiled for the Main Baseline covering the 2019-2037 period – the timeframe needed to assess the long-term impacts of the full removal of tariffs across all commodities in the selected FTAs. Once this work was completed, a top-level comparison was undertaken between the Main Baseline and No-Brexit scenarios (see section Chapter 6 below). Thereafter, the impact of each selected FTA within a Low and High liberalisation context was compiled and aggregated (see section 7). The results were then compared with the Main Baseline to ascertain the projected percentage changes over the forecast period.

- **Quantify impacts on Scottish agri-food and farming:** these assessments were compiled based on the MAGNET modelling analysis and are reported on in Chapter 7. To assess the impact on Scottish agri-food, the projected changes to GVA and prices were applied to average annual output in Scotland during 2018 to 2020 to analyse the potential impacts for each selected commodity. The farm-level analysis was undertaken based on the Scottish Farm Business Income dataset for 2019/20. For potatoes, insights from the Scottish Farm Management Handbook[13] and the ABC Book[14] as well as primary research were used to compile an impact analysis. This is because MAGNET does not cover the potatoes' sector in sufficient detail.

7 **Research Analysis:** was undertaken in conjunction with the Report Development stage, based on the economic modelling results and farm-level assessments. This was accompanied by a commentary on the implications for Scottish agriculture. Here, insights from the Primary Research were also used to ascertain the impact of the Transition Period ending and the FTAs within scope on Scottish agri-food trade. Consideration was also given to the short-term impact (6-12 months) and the long-term impacts (assumed in this study to be when tariff- and quota-free trade is fully in place (i.e. after 15 years)) from application of the policy measures.

8 **Report Development & Finalisation:** the draft summary report, with accompanying Annexes, were compiled to set-out the study's findings. The draft report was peer-reviewed internally by Andersons colleagues. Feedback was incorporated into the report which was submitted to the Project Steering Group. Thereafter, a presentation and feedback session was completed and agreed refinements were incorporated into the final report.

3. Evidence Review Summary

3.1 Introduction

This Chapter summarises the key findings from the Evidence Review (see Annex II) conducted during the early stages of this study (i.e. January to March 2022). The key findings of an examination of 109 pieces of evidence on the potential impact of Free Trade Agreements (FTAs) concerning both EU and non-EU countries on UK and Scottish agriculture. It is broadly split into three parts, as follows;

1. **Impact of Brexit on UK and Scottish farming:** looks at the findings from previous studies (and literature reviews) into the overall (macro) effect of Brexit on the UK, and especially Scottish, farming industry. This is done to inform the extent to which the UK's exit from the EU could affect its agri-food trade. This provides an indication of the scope for the reorientation of trade away from the EU and towards non-EU countries.
2. **Potential impact of new UK FTAs with non-EU countries:** focuses on trade deals that the UK has recently agreed or is in the process of negotiating/finalising with the selected non-EU countries i.e., Australia, NZ, Canada, and the Gulf Cooperation Council. This review looks at both UK and non-UK perspectives (e.g., Australian and NZ-based studies).
3. **Impact of other FTAs:** examines FTAs elsewhere (i.e., do not directly concern the UK) but could have an impact on the sectors within the scope of this study. For instance, the proposed EU-Mercosur FTA, which could have indirect impacts on Scottish beef.

3.2 Key Findings

3.2.1 Brexit Impact Studies

- The direct impact of the UK-EU FTA (TCA) on prices and Scottish farm incomes is relatively small. There are effects from the additional costs of doing trade with the EU but, as the UK is generally a net importer from the EU, this increases prices for many commodities. Whilst there have been some effects on trade during 2021, the findings from these studies suggest that longer-term trade effects are relatively small. The effect of any subsidy changes is the key issue. Significant drops in farm income are seen if farm support is reduced or withdrawn.
- A unilateral liberalisation of trade causes UK prices to fall across all commodities as UK producers are forced to compete with cheaper prices from non-EU

producers. Notably, whilst this did not occur as a result of Brexit, because the TCA was eventually agreed, similar effects could also arise if the UK agrees numerous trade deals elsewhere. This would also have a significant adverse effect on farm incomes.

- In studies that have incorporated labour effects, this is generally seen as detrimental to farm incomes, with limits on free movement of labour increasing UK costs. This effect has been seen during 2021 and became more pronounced due to Covid restrictions on movement and subsequent post-Covid labour market shortages.
- The extent to which any sector, in particular beef, can realise gains in income as a result of Brexit is contingent on the protection afforded to sectors in future trade deals. An increase in non-EU competition is liable to impact the performance of Scottish agriculture[15].
- The success of some sectors of Scottish Agriculture (e.g. beef, lamb, dairy products) will be partly contingent on their ability to safeguard domestic sales and to reorientate trade from EU towards Non-EU markets and to find high-end niches in these markets. In some sectors, there are physical barriers to this (e.g. liquid milk, where a lot of milk is processed in other parts of the UK).

3.2.2 FTAs with Non-EU Countries

- The impact of future FTAs that the UK agrees with non-EU countries on a given sector depends heavily on the comparative advantage that each country/trade bloc has in terms of the goods produced.
- It is evident that trade impacts will be driven by geographic proximity (i.e. the gravity model of trade) [i]. An FTA is not a guarantee of increased trade, particularly with nations like Australia and Canada where trade may be geared towards nations where there are pre-existing FTAs (e.g., Australia-China or Canada-USA-Mexico).
- That said, geopolitical considerations need noting. For Australia in particular, given the recent AUKUS defence pact and the tensions that it gave rise to with China, any diversification towards wealthy countries with a strong food import demand (i.e., the UK) will offer some attraction.

[i] Bilateral trade between two countries is proportional to size, measured by GDP, and inversely proportional to the geographic distance between them (i.e. the shorter the geographic distance, the greater the trade). See: https://www.nber.org/system/files/working_papers/w19285/w19285.pdf

- Research into the impact of FTAs on UK agriculture, let alone Scottish agriculture, is still in its infancy and as such evidence with a UK/Scottish focus is lacking.
- Based on the UK FTA agreements with Australia and NZ, it is evident that the biggest impacts on Scottish agriculture will be in the beef, lamb, and dairy sectors. Import competition will increase whilst export opportunities to these countries will be very niche.
- Although the impact of individual FTAs with Australia, NZ and even Canada (i.e., the enhanced FTA) could be relatively small, the aggregated impact would be more pronounced. Arguably more importantly, such trade deals will create important precedents for future FTAs with major global players such as the US and Mercosur (including Brazil and Argentina). These could have an even greater effect on UK and Scottish agriculture.

3.2.3 Other FTAs

- A 2021 study by EU Joint Research Centre (JRC)[16] examined the cumulative impact of 12 FTAs on EU agriculture (including with Australia, NZ, Canada). It finds that even under an ambitious scenario where 98.5% of tariffs were liberalised and the remaining 'sensitive' products reduce by 50%, the effect on EU production value would be small. Beef and sheepmeat are projected to decline by around 3%; however, the value of EU dairy production rises by a similar magnitude whilst barley production records a minute (0.5%) increase in value.
- An Irish Government impact assessment[17] of the EU-Mercosur trade deal highlights the potential impact of the trade deal on its agri-food sector, particularly beef. Red meat imports from Mercosur to the EU are projected to grow by over 40% with the value of Irish beef output declining by around €50 million. However, Ireland's production output is projected to decline by a much smaller amount. This means that more Irish produce would need to be exported elsewhere (e.g., the UK). This would mean greater price pressure for Scottish producers from Irish imports, at a time when competition from Australia and NZ would also be increasing.
- The Irish Government study implies that a potential UK-Mercosur FTA in the long-term could have a similar (or possibly more pronounced) impact on Scotland, particularly if it is accompanied by a lowering of standards.
- Due to the gravity model of trade, the application of new regional trade agreements covering Asia-Pacific (e.g., Regional Comprehensive Economic Partnership (RCEP)) or North-America (United States-Mexico-Canada Agreement (USMCA or CUSMA)) are projected to lead to greater trade between

geographically proximate countries. This lessens the potential impact of FTAs that the likes of Canada or Australia and NZ (both RCEP signatories) could have on the UK.

3.2.4 Other Issues

- **Farm Support:** as previous studies on Brexit have noted, significant changes to farm support can have a much more pronounced impact on Scottish farm incomes than Brexit (or future trade deals). As Scotland is in the process of formulating future agricultural policy, details have yet to be finalised and support is set to remain at current levels until 2024 at least. With limited detail available, for the purposes of this study, farm support is assumed to remain unchanged.
- **Labour:** the ending of Free Movement resulting from the UK's departure from the EU coupled with the impact of Covid-19 have led to significant increases in labour costs and greatly reduced labour availability across UK and Scottish agriculture. Whilst the Seasonal Workers' Scheme (which has replaced the Seasonal Agricultural Workers' Scheme) offers 30,000 places with the potential to increase by 10,000, this is deemed insufficient for the UK agri-food industry as a whole. Particularly, as many sectors (e.g., meat processing) are not seasonal. Accordingly, and as discussed in Chapter 8, labour will have a notable impact on future Scottish agri-food output and competitiveness.
- **Regulation:** aside from trade-related regulation, covered by non-tariff measures in this study, farm-level regulation, as well as agricultural technology legislation are also important determinants of competitiveness. There is widespread acceptance of the regulatory burden placed on agriculture and the need for reform to enable farmers to get on with the business of farming whilst the sector still retains an appropriate level of oversight. Two often-cited examples in the agricultural technology sphere are the regulation of genetic modification technologies and plant protection products (pesticides). This study assumes no substantive changes to on-farm regulation or to agricultural technology legislation that will be large enough to have an economic impact. It is notable that the Scottish Government has a long-standing policy of opposing the cultivation of GM crops in the open environment. That said, major innovations in this area have the potential to significantly influence the long-term competitiveness of Scottish agriculture.

3.3 Concluding Remarks

Due to the fast-paced nature and infancy of UK trade negotiations, this Evidence Review finds the availability of information, particularly relating to Scottish agriculture, limited. In the two most progressed trade deals with the UK; Australia

and New Zealand, the evidence suggests that the hardest hit sectors will be grazing livestock. This is primarily due to Australia and New Zealand having a comparative advantage in the production and export of beef and sheepmeat.

Where a sector can demonstrate a comparative advantage, and there is some evidence that UK is competitive vis-à-vis Canada in dairying, then this sector is more likely to see a positive impact as a result of an enhanced FTA with Canada. That said, the Canadian dairy market is highly protected and is considered to be highly difficult for overseas suppliers to access, even with an FTA in place.

The Evidence Review clearly shows that the degree of impact resulting from any free-trade agreement will depend upon more than just tariffs and TRQs. NTM arrangements are also vital as is the geographic proximity of both trading parties.

4. Output and Trade Overview

This Chapter examines agricultural output and trade for the UK as a whole, Scotland, and each non-EU partner. UK agricultural output is firstly segmented in terms of trade with EU and non-EU regions with details also provided on the proportion of domestic output that is produced and consumed domestically. This information is used to illustrate the importance of trade at both a general (UK-EU) level but also the importance of exports and imports to production and consumption across the UK as well as in Scotland specifically. From there, section 4.3 gives an overview of agricultural trade is provided for each non-EU partner.

This Chapter forms a prelude to assessing the current impact of trade barriers on UK trade with both the EU27 and selected non-EU partners (see Chapter 5) and the assessment of the impact of the selected FTAs on UK agricultural output and trade (Chapter 7).

4.1 Overview of UK Agricultural Output and Trade

Table 4-1 summarises UK annual output and trade for the selected commodities for the 2018-20 period. UK-level data is provided because this is how most data on overseas trade is presented by official sources (e.g. the HMRC and UN Comtrade). The MAGNET modelling undertaken in this study has also been undertaken on a UK basis.

Table 4-2 and Table 4-3 provide estimated breakdowns of UK production by geographic market and UK consumption by geographic source respectively. They show that for the products under examination in this study, the majority of UK production is consumed domestically. Whilst exports account for a relatively small proportion of sales, they are still significant, especially for sheepmeat but also for barley and beef. Unsurprisingly, exports to the EU dwarf non-EU exports. Table 4-3 also shows that domestically produced sources account for the majority of consumption in most cases.

Table 4-1: Overview of UK Agricultural Production, Trade and Usage (2018-20)

Sector	Value (£m)	UK Production (Kt)	Imports – EU (Kt)	Imports – Non-EU (Kt)	Exports – EU (Kt)	Exports – Non-EU (Kt)	Total New Supply (Kt)③
Cereals①	**3,210**	**21,690**	**1,450**	**603**	**1,789**	**337**	**21,617**
Of which:							
Wheat	2,032	13,146	1,335	602	559	99	14,425
Barley	1,047	7,558	87	1	1,168	236	6,243
Other (Oats)	132	986	28	0	62	2	949
Beef	**2,900**	**918**	**319**	**14**	**132**	**26**	**1,092**
Sheepmeat	**1,279**	**308**	**21**	**64**	**97**	**6**	**290**
Liquid Milk②	**4,445**	**15,165**	**123**	**-**	**923**	**170**	**14,366**
Potatoes	**753**	**5,293**	**2,332**	**80**	**513**	**128**	**7,064**

Sources: Defra (2021), HMRC and Andersons

① Cereals includes wheat, barley and oats only. ② Volume of liquid milk production at farm-gate provided in million litres' terms. ③ Denotes "Total New Supply" in Defra's Agriculture in the UK report. In other words, it means the tonnage available for UK to Consume and it includes both domestic usage and stocks.

Table 4-2: Estimated Breakdown of UK Production by Geographic Market

Sector	UK Production (Kt)	% Consumed in the UK	% Exported to EU	% Exported to Non-EU
Cereals①	**21,690**	**90.2%**	**8.2%**	**1.6%**
Of which:				
Wheat	13,146	95.0%	4.3%	0.8%
Barley	7,558	81.4%	15.4%	3.1%
Other	986	93.5%	6.3%	0.2%
Beef	**918**	**82.8%**	**14.4%**	**2.8%**
Sheepmeat	**308**	**66.4%**	**31.5%**	**2.1%**
Liquid Milk②	**15,165**	**93.9%**	**6.1%**	**0.0%**
Potatoes	**5,293**	**87.9%**	**9.2%**	**2.4%**

Sources: Defra (2021) and Andersons

① Cereals includes wheat, barley and oats only. ② Volume of liquid milk production is in million litres' terms.

Table 4-3: Estimated Breakdown of UK Consumption by Geographic Source

Sector	Estimated UK Consumption (Kt)①	% Produced Domestically	% Imported from EU	% Imported from Non-EU
Cereals②	**21,617**	**90.5%**	**6.7%**	**2.8%**
Wheat	14,425	86.6%	9.3%	4.2%
Barley	6,243	98.6%	1.4%	0.0%
Other	949	97.1%	2.9%	0.0%
Beef	**1,092**	**69.5%**	**29.2%**	**1.3%**
Sheepmeat	**290**	**70.5%**	**7.3%**	**22.2%**
Liquid Milk③	**14,366**	**99.1%**	**0.9%**	**0.0%**
Potatoes	**7,064**	**65.9%**	**33.0%**	**1.1%**

Sources: Defra (2021) and Andersons

① Based on the "Available for UK to Consume (Kt)" data from Table 4-2. ② Cereals includes wheat, barley and oats only. ③ Volume of liquid milk production provided in million litres' terms.

4.2 Scottish Agricultural Output and Trade

As previous studies have stated, there is relatively little Scotland-specific data on sales of agri-food produce by geographic market, because most data are aggregated at the UK level. In its 2020 Brexit study for the Scottish Government[18], Andersons compiled estimated breakdowns of Scottish output by geographic region for 2017-19. To take account of industry input received during this study, Table 4-4 updates these estimates for 2018-20. These estimates need to be treated with caution given the lack of official data. That said, Table 4-4 still helps to inform what the key markets are for Scottish produce.

In comparison with 2017-19, output has not changed markedly since 2018-20 and industry feedback suggests that the geographic breakdown of sales has remained broadly similar. However, there are notable changes in beef and sheepmeat due to the effects of the pandemic. Previously, sales of sheepmeat to the EU accounted for nearly 30% of Scottish output. In 2020, these declined sharply due to the loss of the food services sector. Accordingly, sales of sheepmeat to the EU account for an estimated 21% of output (based on 2019 and 2020 only). Domestic sales within Scotland and in England and Wales made up for this shortfall, buoyed by increased home consumption and takeaway sales.

A similar effect has also occurred with beef but to a much lesser extent as sales to the EU account for a small share of Scottish output. Therefore, the decline versus 2017-19 (8% to 7%) is relatively minor.

Seed potato sales to the EU27 account for a greater share of output (7%) versus 2017-19 (5% share). A key reason for this is that there was a marked increase in trade in late 2020 as the Transition Period was about to end. Since January 2021, sales of Scottish seed potatoes to the EU have been cut-off, which has created a major challenge for the industry. The non-EU (including the Canary Islands) is a crucial outlet for Scottish seed potatoes with Egypt becoming particularly important.

It is apparent that, for most sectors, the internal UK market is by far the most important. Whilst the data presented below focus on direct sales only, England & Wales account for the majority of sales for meat and potatoes. Indirectly, England & Wales is also the main market for processed dairy produce. Furthermore, a substantial proportion of the feed grains used by Scottish farmers is used to produce meat destined for south of the border. The only exception is malting barley where most Scottish produce is used to make whisky which is sold worldwide.

Table 4-4: Estimated Breakdown of Scottish Agricultural Sales by Geographic Market (2018-20)

Sector	Scottish Production (Kt)	% Sold in Scotland	% to England & Wales	% to NI	% to EU27	% to Non-EU
Wheat	852	~95%	<5%	<1%	Neg.	Neg.
Malting barley	944	~90%①	<10%	Neg.	Neg.	Neg.
Other Barley	854	~90%	<5%	3%	3%	Neg.
Beef②	166	25%	~66%	≤2%	7%	<1%
Sheepmeat②	63	20%	58%	Neg.	21%	Neg.
Liquid Milk③	1,312	~83%	~17%	Neg.	Neg.	Neg.
Seed Potatoes	282	~21%	~47%	~1%	7%	24%
Other Potatoes	807	10-11%	86-88%	~1%	1-2%	Neg.

Sources: Scottish Government, Defra, QMS and Andersons

① Assumes that the Scottish barley used to produce malt in Berwick is mostly sold back to Scotland ②Breakdown based on 2019 and 2020 values. Excludes fifth quarter. Some product will be sold to companies situated in England/Wales, further processed, and sold back as finished goods to Scotland. ③ Volume of liquid milk production is in million litres' terms. Estimated breakdowns based on 2019/20 AHDB data[19] which only focus on where the liquid milk is processed. They do not consider where processed dairy products (e.g. cheese) are sold to. Here, it is only possible to get reliable data at a UK level. Potatoes' estimates have been derived from primary research input. "Neg" denotes negligible volumes.

4.3 Agricultural Output and Trade for Each Non-EU Partner

This section summarises the agricultural output and trade for each non-EU partner within scope. A brief overview of agricultural production and trade (exports and

imports) is provided in tonnage terms during 2018 to 2020. The UK's trade with each non-EU partner is also outlined as this depicts the current level of trade taking place. In so doing, an overview of the exportable surplus and estimated imports for each partner provides insights into the scale of the potential threat or opportunity from a UK and Scottish perspective.

4.3.1 Australia

Table 4-5 shows Australian production and trade for the selected commodities during 2018-2020. For most commodities, Australia exports substantial quantities, particularly for beef, sheepmeat and wheat. In contrast, imports of these commodities are relatively small owing to Australia's strong domestic production and relatively isolated location.

Whilst Australian exports of dairy products are also significant in relative terms, with the exception of cheese, its exports are markedly lower than those of New Zealand (see Table 4-7). That said, around 40% of Australian milk production is exported in some form which implies that there is potential for significant volumes to be exported to the UK in the future if such exports are competitive. As Table 4-5 also depicts, there are sizeable volumes of cheese and butter imported into Australia. It is likely that New Zealand is a major contributor to this but the data also suggests some opportunities for British speciality cheeses in the future.

As regards potatoes, just over 40Kt are exported from Australia, but that is only a small percentage (3%) of its production, whilst minimal imports take place.

Table 4-5: Australia – Output and Trade Overview – 2018 to 2020

Sector	Production (Kt)	Exports (Kt)	% Exported	Imports (Kt)	Total New Supply^	Imports % of New Supply
Wheat	21,793	13,996	64%	531	8,328	6%
Barley	10,682	5,118	48%	0	5,564	0%
Beef	2,289	1,598	70%	15	706	2%
Sheepmeat	693	459	66%	2	236	1%
Butter	79	17	21%	42	104	40%
Cheese	368	162	44%	98	304	32%
WMP	49	45	91%	36	40	89%
SMP	168	137	82%	15	46	32%
Overall Milk (Mn L)*	8,863	3,539	40%	1,825	7,149	26%
Potatoes	1,386	41	3%	0	1,345	0%

Sources: USDA, UN FAO, Hort Innovation, Australian Bureau of Statistics and Andersons

Notes: ^ Derived consumption estimate, based on production minus exports plus imports.

* Converts major categories of dairy products into milk equivalent, including liquid milk.

Table 4-6 shows average annual UK-Australia trade during 2018 to 2020. Sheepmeat (£42.2m) is the most imported product category, followed by beef (£12.3m). In the cases of sheepmeat and beef, this import trade is primarily predicated on TRQs, although some, highly niche, out-of-quota trade occurs in the high-end food services sector. Whilst a small amount of wheat (£2m) is imported, imports of other commodities are minimal.

As regards UK exports to Australia, dairy exports (£15.5m) are significant, accounting for over 90% of total exports for the commodities listed. Cheese (£8.7m) is of most significance within the dairy category, although butter (£2.1m) and whey (£1.8m) are also notable. A small amount of malt exports (£0.8m) also occurs but other exports are minimal.

Table 4-6: UK-Australia Trade – Selected Products – 2018 to 2020

Sector	UK Exports (£M)	UK Exports (Kt)	UK Imports (£M)	UK Imports (Kt)
Wheat	0.1	0.0	2.0	5.7
Wheat products	0.0	0.0	0.0	0.0
Barley	0.0	0.0	0.0	0.0
Malt products	0.8	1.4	0.0	0.0
Beef	0.1	0.0	12.3	1.7
Sheepmeat	0.0	0.0	42.2	8.4
Dairy	15.5	4.1	0.4	0.1
Potatoes	0.0	0.0	0.0	0.0
Total	**16.6**	**5.6**	**56.8**	**15.9**

Sources: HMRC and Andersons

Note: Sector amounts may not equal to totals due to rounding.

Australia has the potential to export significant volumes of beef and sheepmeat to the UK. It also has the potential to exert some competitive pressure on dairy products and wheat. Export opportunities for Scotland appear to be limited to higher-end niches in the dairying and malt product categories.

4.3.2 New Zealand

Table 4-7 shows that with the exception of wheat and barley, NZ is heavily reliant on agri-food exports with nearly 90% of beef, sheepmeat and milk output exported. For specific dairy products, exports are even more important. Virtually all NZ milk powder is exported; 94% of butter and 91% of cheese production are also sold internationally. A notable proportion (18%) of NZ potatoes are exported.

Imports of wheat into NZ account for more than half of annual consumption. It does not feature strongly on barley trade with imports estimated at 26Kt per annum. Some imports of potatoes, beef and cheese also take place and for the latter two categories, these are likely to be high-end niche products.

Table 4-7: New Zealand – Agricultural Production and Trade Overview – 2018 to 2020

Sector	Production (Kt)	Exports (Kt)	% Exported	Imports (Kt)	Total New Supply^	Imports % of New Supply
Wheat	408	20	5%	528	916	58%
Barley	367	-	0%	26	393	7%
Beef	704	621	88%	13	96	13%
Sheepmeat	452	391	86%	6	67	9%
Butter	525	494	94%	1	32	3%
Cheese	362	328	91%	12	45	26%
WMP	1,503	1,479	98%	3	27	10%
SMP	382	362	95%	5	25	20%
Overall Milk (Mn L)*	21,327	18,676	88%	673	3,324	20%
Potatoes	519	95	18%	20	445	4%

Sources: USDA, UN FAO, UN Comtrade, Beef & Lamb NZ, Potatoes New Zealand and Andersons.

Notes: ^ Derived consumption estimate, based on production minus exports plus imports.

* Converts major categories of dairy products into milk equivalent, including liquid milk.

In terms of the UK's trade with NZ, Table 4-8 shows the sheepmeat (£228m) dominates, with beef (£3.1m) and dairy (£1.6m) being relatively modest. This is primarily a reflection of the TRQs in place for each commodity during the base period. Again, some out-of-quota trade in beef and lamb takes place in high-end food service niches. All other import trade is minimal.

Whilst exports to NZ total just £6.3m for the commodities selected, dairy exports (£5.2m) are notable. These primarily consist of whey products (£4.6m) and cheese exports averaged just over £0.5m. As with Australia, some exports of malt (£0.4m) are taking place, but such a small and distant market is unlikely to be of much interest to Scottish maltsters.

Table 4-8: UK-NZ Trade – Selected Products – 2018 to 2020

Sector	UK Exports (£M)	UK Exports (Kt)	UK Imports (£M)	UK Imports (Kt)
Wheat	0.0	0.3	0.0	0.0
Barley	0.0	0.0	0.0	0.0
Malt products	0.4	0.6	0.0	0.0
Beef	0.0	0.0	3.1	0.7
Sheepmeat	0.7	0.3	228.0	42.4
Dairy	5.2	3.4	1.6	0.4
Potatoes	0.0	0.0	0.0	0.0
Total	**6.3**	**4.8**	**232.7**	**43.5**

Sources: HMRC and Andersons

Note: Sector amounts may not equal to totals due to rounding.

As with Australia, NZ has the potential to be a strong competitor in terms of dairy products, sheepmeat and beef with minimal competitive threat elsewhere in terms of the commodities within scope. Export opportunities again appear to be limited, arguably even more so than Australia.

4.3.3 Canada

Table 4-9 provides an overview of Canadian production and trade for each commodity during 2018 to 2020. Here, wheat exports are particularly important, equating to 75% of production whilst a sizeable proportion (27%) of barley is also exported.

Exports also feature prominently in beef and equate to 39% of output. However, exports of sheepmeat and dairy products are largely minimal, aside from SMP (52% of production is exported). Potato exports (11% of output) are also of some significance although much of this is associated with the US.

Regarding imports, sheepmeat is most prevalent with circa 71% of supply purchased from abroad. This implies a potential opportunity for the UK and Scotland. Imports also account for a sizeable share of beef (22%) and butter (17%) consumption, although the US is again highly influential.

Table 4-9: Canada – Agricultural Production and Trade Overview – 2018 to 2020

Sector	Production (Kt)	Exports (Kt)	% Exported	Imports (Kt)	Total New Supply^	Imports % of New Supply
Wheat	33,402	24,992	75%	569	8,979	6%
Barley	9,835	2,691	27%	133	7,277	2%
Beef	1,307	505	39%	230	1,032	22%
Sheepmeat	16.6	0.3	2%	39.3	56	71%
Butter	115	3	3%	24	136	17%
Cheese	516	11	2%	36	541	7%
SMP	98	51	52%	3	51	7%
Overall Milk (Mn L)*	9,672	661	7%	373	9,385	4%
Potatoes	5,202	578	11%	14	4,638	0%

Sources: USDA, UN FAO, UN Comtrade, Statistics Canada and Andersons

Notes: ^ Derived consumption estimate, based on production minus exports plus imports. * Converts major categories of dairy products into milk equivalent, including liquid milk.

Table 4-10 shows that UK imports of wheat from Canada (£92.5m) are significant and much of this is linked to the milling sector. However, for other commodities, imports from Canada are quite small. On the exports' side, dairy products (£13.6m) and beef (£10.6m) are the most significant. For the former, cheese exports (£12.4m) are dominant. Malt exports (£2.7m) are also of some significance. However, sheepmeat exports (£0.8m) are low, particularly in comparison with beef exports and considering the amount of sheepmeat that Canada imports, often from sources much further afield than the UK.

Table 4-10: UK-Canada Trade – Selected Products – 2018 to 2020

Sector	UK Exports (£M)	UK Exports (Kt)	UK Imports (£M)	UK Imports (Kt)
Wheat	0.0	0.0	92.5	415.9
Wheat products	0.1	0.1	0.0	0.1
Barley	0.1	0.2	0.0	0.0
Malt products	2.7	4.6	0.0	0.0
Beef	10.6	3.2	0.0	0.0
Sheepmeat	0.8	0.2	0.1	0.0
Dairy	13.6	1.9	0.3	0.0
Potatoes	0.0	0.0	0.0	0.0
Total	**27.8**	**10.2**	**92.9**	**416.1**

Sources: HMRC and Andersons

Note: Sector amounts may not equal to totals due to rounding.

Overall, the data suggest that whilst Canada poses some competitive threats in terms of wheat and beef, there are also export opportunities, particularly for cheese, beef exports and sheepmeat.

4.3.4 Gulf Cooperation Council (GCC)

Table 4-11 shows the agricultural output and trade for the GCC countries combined. As the data aggregates six countries and given the scarcity of data on dairy products' production in particular, there is not as much detail as for the other countries. However, what is evident is that the GCC is heavily reliant on imports, particularly for wheat and barley, but across other commodities as well.

Table 4-11: GCC – Agricultural Production and Trade Overview – 2018 to 2020

Sector	Production (Kt)	Exports (Kt)	% Exported	Imports (Kt)	Total New Supply^	Imports % of New Supply
Wheat	206	213	104%	5,983	5,976	100%
Barley	14	-	0%	8,080	8,094	100%
Beef	61	9	15%	249	301	83%
Sheepmeat	215	53	24%	511	674	76%
Butter		3		24		
Cheese		11		36		
SMP		51		3		
Overall Milk (Mn L)*	2,531	1,224#	48%	2,339#	3,646	64%
Potatoes	543	50	9%	1,060	1,553	68%

Sources: USDA, UN FAO, UN Comtrade, and Andersons

Notes: ^ Derived consumption estimate, based on production minus exports plus imports.

* Converts major categories of dairy products into milk equivalent, including liquid milk. # Based on UN Comtrade data only, domestic production data unavailable.

As Table 4-12 illustrates, some export trade is already taking place especially in dairy (£38.2m). Cheese exports account for approximately half of this amount. Exports are also notable for barley (£6.1m) and sheepmeat (£4.8m). It is estimated that UK potato exports to the GCC are approximately £2m, seed potatoes (£1.7m) account for the majority of this trade, which is particularly notable for Scotland.

As regards imports, given that the GCC is a net-importer for most commodities, trade with the UK is negligible.

Table 4-12: UK-GCC Trade – Selected Products – 2018 to 2020

Sector	UK Exports (£M)	UK Exports (Kt)	UK Imports (£M)	UK Imports (Kt)
Wheat	0.1	0.0	0.1	0.2
Wheat products	1.0	1.4	0.0	0.0
Barley	6.1	42.9	0.0	0.0
Malt products	0.6	0.4	0.0	0.0
Beef	1.0	0.2	0.1	0.0
Sheepmeat	4.8	0.7	0.0	0.0
Dairy	38.2	10.8	0.0	0.0
Potatoes	2.0	3.8	0.0	0.0
Total	**53.8**	**60.2**	**0.1**	**0.2**

Sources: HMRC and Andersons

Note: Sector amounts may not equal to totals due to rounding.

The data presented for the GCC implies that there are potentially significant export opportunities for the UK and Scotland in the GCC region. Dairy products already have had some success and industry input suggests that this could be built upon further, especially of high-end products such as speciality cheeses but also for premium yoghurts (which are likely to be shipped via airfreight). Here, high-end retail and food services sectors are considered important. For cheese, one can sometimes see European cheeses being sold in 10-slice portions which is often cling-film wrapped at deli counters. Food services also presents opportunities for butter as it is often sold to this segment in 5kg blocks.

Purchasing activities in some GCC countries is dominated by a few key players (e.g., Saudi Arabia) which are important to focus on. However, export opportunities do vary across the region. Oman is less affluent and considered more challenging whilst Qatar has recently brought in some stringent labelling and shelf-life requirements which greatly inhibits the ability of UK exporters. Minimum and maximum shelf-life labelling information is now required on dairy products in Qatar. This is seen by some as an attempt by the Qatari authorities to shut-out imports and protect its domestic sector.

Therefore, if Scottish companies are targeting the GCC region, it would be best to focus on select high-end niches where price is not as much of a concern. According to some industry experts, affluent consumers account for around 30% of the population in the UAE for instance. This consists of affluent locals and Western ex-pats. The latter should be a prime target segment for Scottish dairy exporters and some experts believe that the distinct nature of Scottish produce would be a competitive advantage for affluent consumers seeking something 'different'.

For beef and sheepmeat, it is arguable that greater export trade could be taking place; however, Halal requirements are viewed by most industry participants as being the major hurdle, especially for beef. This is particularly so in Scotland where major processors have taken the decision not to slaughter Halal to meet the requirements of UK retail customers. Efforts are underway via the Demonstration of Life Protocol[20] to meet key animal welfare requirements for humane slaughter of sheep and lambs whilst also adhering to the interpretation of Halal specified by GCC countries. However, most interviewees are sceptical about whether any significant opportunities will emerge for Scottish farmers.

Feed grain is another potential opportunity although the extent to which any trade occurs will always be contingent upon what exportable surplus is available from the Black Sea region. Whilst sanctions on Russia might have ceased trade with the West, such restrictions do not necessarily apply to other regions. Therefore, whilst more exports to the GCC are possible, it may be that the UK might be more competitive when trading with other regions i.e., Europe and North Africa.

Although some potato exports take place between the UK and GGC countries, market opportunities are deemed limited, particularly in the seed potatoes sector as crops struggle to grow in temperatures above 30 degrees Celsius. Industry input also suggests that new phytosanitary certification requirements in Saudi Arabia are creating further difficulties for exporters from Western Europe.

4.4 Concluding Remarks

The data presented shows that for UK and Scottish agriculture, the UK market is the most important outlet for produce. However, exports are important in several sectors, with the EU playing a dominant role. Although UK has now left the EU Single Market, given the EU's geographic proximity and size, its importance as a trading partner remains crucial. This is despite the trade barriers which have now been placed on trade.

Trade with non-EU countries is growing and there are some notable opportunities, but these are very much seen as a 'bonus' for the Scottish agri-food sector. Of greater concern in the view of many industry participants is to safeguard Scotland's competitive position within the UK market and the EU.

5. Trade Barriers Assessment

This Chapter summarises the key trade barriers that currently affect UK trade with the non-EU partners. It focuses specifically on tariffs, tariff rate quotas (TRQs), and non-tariff measures (NTM). Although the Trade and Cooperation Agreement (TCA) between the UK and the EU permits tariff- and quota-free trade between both parties, NTMs are now applicable. Accordingly, section 5.3 also sets out the estimated NTM AVEs on UK-EU trade as this will have indirect effects on UK trade with non-EU countries. Supplementary information is provided in Annex III.

5.1 Tariffs

To calculate how the UK Global Tariff (UKGT) would apply to UK imports from non-EU partners, as well as the levels of tariffs in the opposite direction during 2018-2020, this study firstly derived prices for each selected product based on trade data. Table 5-1 shows the pricing data for each selected partner and product using data from UN Comtrade. The pricing data are based on each selected partner's exports and imports from all countries. The UK's export prices for the selected products, based on HMRC data, are also shown for comparison purposes.

Some might argue that the pricing data should focus on exports to, and imports from, the UK and the non-EU partner in question. However, with the small amount of trade taking place in some instances (due to the absence of an FTA), UK-only pricing data is potentially flawed. This is because trade is likely to change significantly once an FTA is in place. Using pricing data for total exports from the UK and other selected partners illustrates the potential competitiveness of each partner by commodity.

Contrary to some expectations, the prices of UK exports are generally competitive. That said, averages should be interpreted with caution. A significant proportion of UK beef trade is influenced by cross-border operations on the island of Ireland where product is regularly shipped between processing plants owned by the same companies on both sides of the border. Transfer pricing is often a feature of such trade, and it can downplay the actual prices of the products in question. This is also a feature to an extent in the dairy products' category. Another issue is that although UK lamb prices are on average lower than NZ or Australia, seasonal factors heavily influence UK lamb prices. Imports from Australia and NZ arrive at a time of year when UK lamb prices are traditionally high due to lack of local supply.

Based on pricing data in Table 5-1, Table 5-2 outlines the resultant tariffs when the UKGT is applied on export prices from each partner. It also shows the tariffs applicable on imports for each non-EU partner within scope. Generally, despite the slight refinements and simplifications made to the UK Global Tariff (UKGT) vis-à-vis the EU Common External Tariff (CET) (see Annex III for more detail), the UKGT is

significantly higher for most products than their selected peers. Canada is the main exception to this as it imposes substantial tariffs on dairy and grain imports in particular (and beef to an extent). It too is keen to protect its domestic producers from cheaper global competitors.

While Australia also imposes some tariffs on dairy imports, they are relatively low (<20%) and for most other products no tariff is applied. The GCC is a net importer for most products and, therefore, has a broadly liberal tariff regime. That said, some tariffs are imposed on dairy products as there are domestic dairy industries in Saudi Arabia and Qatar in particular.

NZ is at the opposite end of the spectrum insofar that no tariffs are imposed. This is in line with the policy stance that it has taken since the 1980s when it decided to expose its farming industry to global competition and to remove the protection (tariffs and agricultural support) it had offered previously.

Based on the analysis presented in Table 5-2, it is evident that despite some TRQs being in operation (see next section), domestic UK and Scottish producers are afforded a high degree of protection presently from the UKGT.

Table 5-1: Average Prices by Selected Commodity for Imports and Exports for Each Selected Partner (2018-20), £ per Tonne

HS Code	Short Description	UK Exports (to All)	AU Export (e.g. to UK)	AU Import	CA Export	CA Import	GCC Export	GCC Import	NZ Export	NZ Import
020110	Chilled beef carcases/half-carcases	2,171	2,809	3,322	6,339	1,695	2,320	2,320	6,474	N/A
020130	Chilled boneless Beef	4,840	6,618	9,020	4,204	7,460	2,600	5,103	6,654	5,180
020230	Frozen boneless beef	2,220	3,875	3,711	3,806	5,175	2,941	2,941	3,925	3,527
020410	Chilled lamb carcases and half-carcases	4,537	4,821	5,982	3,565	3,591	1,447	5,656	5,557	5,111
020422	Chilled sheepmeat cuts, bone in	4,617	6,798	4,815	12,612	8,976	5,164	5,776	7,075	6,194
020423	Chilled boneless sheepmeat	5,753	7,104	5,947	4,960	6,921	4,899	6,200	8,759	8,976
020442	Frozen sheepmeat cuts, bone in	3,136	3,610	3,823	11,462	5,063	3,426	3,596	4,470	3,262
020443	Frozen boneless sheepmeat	4,660	4,791	2,068	6,938	8,521	2,109	3,802	5,709	4,105
040510	Butter (excl. dehydrated butter and ghee)	3,390	4,132	3,854	2,436	8,162	3,519	3,801	3,719	4,584
040590	Fats and oils derived from milk, and dehydrated butter and ghee (excl. natural & other butter)	4,492	3,223	4,251	3,336	3,699	5,103	4,336	4,130	5,036
040610	Fresh Cheese (unfermented)	2,819	3,006	3,383	3,335	3,769	2,340	2,810	2,931	3,937
040690	Cheese (excl. fresh cheese, incl. processed and blue-vein cheese)	3,784	3,279	4,338	4,399	7,041	3,083	3,337	3,084	4,533
070110	Seed potatoes	517	729	3,836	306	249	474	318	355	N/A
070190	Potatoes (fresh, excl. seed)	336	418		417	391	327	227	432	604
100199	Wheat and meslin (excl. seed)	167	196	474	184	N/A	708	233	347	215
100390	Barley (excl. seed)	157	176	1,465	176	460	580	180	865	246

Sources: HMRC, UN Comtrade, Canadian Government and Andersons

Note: Import and Export prices are based on UN Comtrade data for all imports and all exports (i.e. UK, EU and Non-EU) by HS code for each Country/Bloc converted into Sterling using average ECB exchange rates for 2018-2020.

Table 5-2: Indicative Tariffs (Ad-Valorem Equivalents (%)) for the UK and Selected Territories

HS Code	Short Description	UKGT (from AU) (%)	UKGT (from CA) (%)	UKGT (from GCC) (%)	UKGT (from NZ) (%)	AU %	CA %	GCC %	NZ %
020110	Chilled beef carcases/half-carcases	64%	35%	75%	35%	0%	27%	0%	0%
020130	Chilled Boneless Beef	50%	72%	109%	50%	0%	27%	0%	0%
020230	Frozen boneless beef	60-78%	61-79%	75-98%	59-77%	0%	27%	5-6%	0%
020410	Chilled lamb carcases and half-carcases	42%	52%	111%	38%	0%	0%	0%	0%
020422	Chilled sheepmeat cuts, bone in	27-39%	20-27%	31-48%	26-38%	0%	0%	0%	0%
020423	Chilled boneless sheepmeat	49%	64%	65%	42%	0%	0%	0%	0%
020442	Frozen sheepmeat cuts, bone in	33-66%	19-29%	34-69%	29-56%	0%	0%	5%	0%
020443	Frozen boneless sheepmeat	53%	40%	105%	46%	0%	0%	5-7%	0%
040510	Butter (excl. dehydrated butter and ghee)	38-47%	65-79%	45-55%	42-52%	0%	299%	6%	0%
040590	Fats and oils derived from milk, and dehydrated butter and ghee (excl. natural & other butter)	60%	58%	38%	47%	0%	314%	10%	0%
040610	Fresh Cheese (unfermented)	51-62%	46-55%	66-79%	53-63%	19%	246%	6%	0%
040690	Cheese (excl. fresh cheese, incl. processed and blue-vein cheese)	38-56%	29-42%	41-60%	41-60%	15%	246%	5-6%	0%
070110	Seed potatoes	4%	4%	4%	4%	0%	1%	0%	0%
070190	Potatoes (fresh, excl. seed)	4-10%	4-10%	4-10%	4-10%	0%	1%	0%	0%
100199	Wheat and meslin (excl. seed)	0-40%	0-43%	0-11%	0-23%	0%	77%	0%	0%
100390	Barley (excl. seed)	44%	44%	13%	9%	0%	21%- 95%	0%	0%

Sources: UK Government, Canadian Government and Andersons

Note: Tariff ad-valorem equivalents (AVEs) are based on the prices shown in Table 5-1 above. The UKGT varies significantly due to its tariffs having both a specific (fixed) and a percentage component which leads to significant differences in the AVEs when applied to products with varying price levels.

5.2 Tariff Rate Quotas (TRQs)

For this study, there are two types of TRQ currently in operation which are of interest. The first are 'WTO TRQs' which were introduced when the UK was an EU Member State and have since been split between the UK and the EU27. These are discussed in section 5.2.1. Secondly, some TRQs have been granted by the UK via FTAs ('FTA TRQs') which are currently in force. This includes the Canada-UK Trade Continuity Agreement (CUKTCA). Details of relevant FTA TRQs are detailed in section 5.2.2.

5.2.1 WTO TRQs

Some preferential trade already takes place between the UK and Australia, Canada and New Zealand via 'WTO TRQs' which have been split between the UK and the EU-27 since Brexit. These are set-out in detail in Table III-2 of Annex III, with a top-level summary given in Table 5-3.

Table 5-3: Summary of UK WTO Tariff Rate Quotas for Imports arising from EU Exit

Category	In-Quota Tariff Rate	Quota (T)	Comments
Beef	Varies (≥20%)	61,230	7.5% specifically available to Australia; 1.6% specifically available to Canada/US.
Sheepmeat	0%	127,562	NZ has 89.5% specific share; Australia (10.5%)
Dairy products	Varies by product	53,383	NZ has 60.8% specific share; Australia (5.5%) and Canada (7.5%)
Wheat	£10.04/t	123,325	Canada has 30% share of this (though TRQ jointly managed with EU27)
(Malting) Barley	£6.69/t	30,101	Available to all non-EU countries

Sources: HMRC and HM Treasury[21], analysed by The Andersons Centre

Note: detailed breakdown provided in Table III-2 of Annex III.

In terms of meat, the most significant WTO TRQ is the 114Kt of sheepmeat (lamb) which is available to NZ. Australia also benefits from a lamb TRQ surpassing 15Kt. In recent years, the uptake of these TRQs has been significantly lower than the quota limits as both Australia and NZ have focused on the Asia-Pacific market, particularly with the onset of African Swine Fever (ASF) in China.

The market access via TRQs for beef is more limited (just over 61.2Kt for selected non-EU partners) because, whilst tariffs are reduced vis-à-vis the UKGT, they are not removed completely. These in-quota tariffs range from 20% upwards. In addition,

there are also restrictions on the types of products permitted for import, with a number being limited to frozen products which are open to all non-EU countries. There is a specific beef TRQ for Australia and it is permitted to import nearly 4.7Kt annually. NZ's TRQ is much smaller (just under 0.5Kt). Previously, Canada also had access (along with the US) to an 11.5Kt TRQ when the UK was an EU Member State, however, the UK's is now offering a 1Kt TRQ to the US and Canada.

In terms of dairy products, the UK grants sizeable access to NZ for butter (27.5Kt), cheddar cheese (2.6Kt) and processing cheese (2.3Kt). Canada also has access to the UK market via a 4Kt cheese TRQ. Australia's access is currently limited to TRQs available to all non-EU countries, the largest of which is an 8.3Kt TRQ for processing cheese. In total, importers can now access dairy product TRQs of nearly 53.4Kt for the UK market.

For wheat, the UK grants access of over 123Kt via two main TRQs. Canada has access to a 37.4Kt TRQ for low and medium quality wheat, although this is jointly managed with the EU27. There is an additional 85.9Kt TRQ available to all other countries (excluding Canada) for low and medium quality wheat.

The TRQ for malting barley amounts to just over 30Kt. It is therefore, of particular relevance to the Scottish barley sector, given the importance of whisky distilling.

5.2.2 FTA TRQs

Under the CUKTCA[22], additional TRQs have been allocated for wheat and beef imports into the UK from Canada. These are outlined in Table 5-4 below. Access for wheat is more than double the WTO TRQ with an additional TRQ of nearly 52Kt. Access for beef has increased by nearly 3.9Kt.

The CUKTCA also made provision to continue UK exports of cheese to Canada via the WTO TRQ in operation when the UK was an EU Member State. This shall be the case until December 2023 with a review taking place by June 2023. This WTO TRQ currently totals just over 20.4Kt[23]. It is divided into two reserves, of which the EU has access to 69.9% (nearly 14.3Kt)[24]. Under CUKTCA, the UK would continue to access this TRQ as part of the 14.3Kt EU reserve.

Table 5-4: Additional TRQs Granted to Canada by the UK via the CUKTCA vis-à-vis WTO TRQs

Sector / Commodity	Annual Quantity (T)	In-Quota Tariff (%)	Years applicable	Comments
Wheat	51,600	0%	2021 to 2023	Relates to low and medium quality common wheat
Chilled beef & veal	2,708 (CWE)	0%	From 2022	Encompasses HS codes 020110, 020120, 020130 and 020610
Frozen beef & veal	1,161 (CWE)	0%	From 2022	Encompasses HS codes 020210, 020220, 020230, 020629, 021020 and 021099

Sources: UK Government and Andersons

Note: CWE denotes carcase weight equivalent. All products imported via these TRQs need to be converted from their product weights to a CWE. This has the effect of lowering the volume of access overall.

5.3 Non-Tariff Measures (NTMs)

This section summarises the results of the NTM cost assessments undertaken during this study. As alluded to at the outset of this Chapter, it focuses on NTMs for the UK's trade with the non-EU countries within scope in addition to UK-EU trade. The NTMs are primarily expressed in ad-valorem equivalent (AVE) terms. The methodology is outlined in Annex I and is broadly similar to that of the 2020 Brexit study that Andersons undertook for the Scottish Government. Annex III provides more detailed information on the NTMs applicable for each non-EU partner.

Results are presented below on a probabilistic basis (i.e., averaged out over 100 loads). The estimates have been derived using a combination of desk-based and primary research. Within some product categories, such as beef, sheepmeat and dairy, NTM estimates have been compiled at a sub-product level (i.e., using HS6 commodity codes and associated trade) for the top-3 to 5 most commonly traded products within each category. This is because there can be significant variation in NTM costs within some products (e.g. frozen beef versus chilled beef). These NTM costs were then weighted based on the share of each selected sub-product to derive an overall NTM AVE for the product category. It is this weighted average which is then used for the CGE modelling.

The prices used in the NTMs assessment (see Table 5-1) are also worth noting. For imports potentially coming into the UK from selected countries / blocs, the prices used are based on the global export price (value of exports / net weight of exports) of each product for each country or trade bloc. Accordingly, for imports coming in from Australia for example, the price is based on the average Australian export price to all countries for a given product during 2018-2020. Similarly, for any exports that the UK might potentially undertake, the price is based on the UK export price to all countries for 2018-2020. For UK exports, this has the advantage of facilitating a comparison of NTM costs between Canada and GCC countries for instance.

5.3.1 UK - Australia

Table 5-5 summarises the NTM AVEs for Australian trade for the products within the scope of this study. Further detail including NTM AVEs by commodity code within each product category and associated pricing data are provided in Annex III. Notably, the prices underpinning the NTM AVEs are based on the export prices from Australia and the UK to all countries during the 2018-2020 period. Whilst it is arguable that the NTM AVEs should be based on Australia-to-UK trade only, this trade is currently relatively small. With the introduction of the new FTA, greater volumes of Australian product will be available to export to the UK which was not available previously. As such, this additional volume will be coming from product that was previously routed elsewhere. Therefore, focusing on the exportable surplus price from Australia is a more realistic starting point for the level of competition that Scottish and UK suppliers will face in the future.

As Table 5-5 shows, the NTM AVEs for beef and sheepmeat average at 2.6% and 2.9% respectively for exports from Australia to the UK. In comparison with imports into Australia from abroad, the AVEs for Australian exports (assumed to apply for Australian exports to the UK) are relatively low. This is partly a function of the high prices for Australian red meat exports to the UK which are approaching £5,000 per tonne, significantly higher than the corresponding prices for imports into Australia.

Conversely, for the dairy products category, the average NTM AVE for Australian exports are estimated at 2.7%, slightly lower than the corresponding imports' figure (2.8%). Again, differences in prices are a key factor.

Given the large shipment sizes involved, NTM AVEs for grain are minimal and average at 0.2% for Australian exports and 0.1% for imports into Australia from overseas. These small NTM costs also reflect the industry feedback which mentions that whilst NTM-related administration takes time and paperwork, it is a small fraction of the value of shipments traded.

NTM AVEs for potatoes (6.0-7.2%) are significantly higher than for grain. This is chiefly a function of potatoes being shipped via containers, each assumed to hold

around 26t on average. The NTM AVEs outlined below have been used in the CGE modelling, the results of which are set-out in Chapter 7.

Table 5-5: NTM AVEs for Australian (AU) Trade across Selected Product Categories

Commodity Category	AU Exports (Imports into UK)		AU Imports	
	Price (£/T)	NTM AVE (%)	Price (£/T)	NTM AVE (%)
Beef	4,959	2.6%	3,445	6.5%
Sheepmeat	4,780	2.9%	3,876	4.9%
Dairy	3,214	2.7%	3,677	2.8%
Wheat	347	0.2%	167	0.1%
Barley	865	0.2%	157	0.1%
Potatoes	470	6.0%	517	7.2%

Source: The Andersons Centre (2022) based on pricing data from UN Comtrade and HMRC

Note: prices per tonne are aggregated and weighted by the amount of trade taking place for each HS code within the commodity category.

5.3.2 UK - New Zealand (NZ)

Table 5-6 shows the summary NTM AVEs for NZ-UK trade. Again, the NZ exports column is based on the prices of NZ exports to all countries converted into Sterling. NZ imports are based on export prices from the UK to all countries. As noted earlier, whilst NTM estimates for UK exports are provided for comparison purposes, given the products within scope and New Zealand's distance from the UK, any exports from the UK to NZ are minimal.

The probability-based NTM costs for NZ are generally lower than those for Australia and this is primarily a function of the veterinary agreement that applies to trade in products of animal origin between the UK and NZ. For imports into the UK, NTM AVEs are estimated at 1.3-1.6%. Again, NTM AVEs on grain is minimal and the potatoes NTM AVE for exports from NZ to the UK is 2.7%, although industry participants thought that any potatoes' trade between both countries would be minimal.

Table 5-6: NTM AVEs for NZ Trade across Selected Product Categories

Commodity Category	NZ Exports (Imports into UK)		NZ Imports	
	Price (£/T)	NTM AVE (%)	Price (£/T)	NTM AVE (%)
Beef	4,292	1.6%	3,208	3.1%
Sheepmeat	5,364	1.3%	3,345	2.7%
Dairy	3,641	1.4%	3,642	1.8%
Wheat	347	0.1%	167	0.1%
Barley	865	0.1%	157	0.1%
Potatoes	690	2.7%	336	5.7%

Source: The Andersons Centre (2022) based on pricing data from UN Comtrade and HMRC

Note: prices per tonne are aggregated and weighted by the amount of trade taking place for each HS code within the commodity category.

5.3.3 UK - Canada

Table 5-7 shows the NTM AVE estimates for Canadian trade in the selected agri-food commodities. For commodities such as beef, it is conceivable that trade could flow in both directions. Therefore attention needs to be paid to both sets of NTM AVEs. The data show that NTM levels are lower for imports into the UK from Canada. This is partly as a result lower check rates which have been applied to red meat imports from Canada as a result of the CUKTCA. For red-meat, the probability-based NTM AVEs for UK imports from Canada are based on 10% physical checks, which is lower than the default of 15%. This is why the NTM AVEs are somewhat lower for Canada than they are for Australia.

However, the prices per tonne are again the key determinant of lower NTM AVEs on Canadian exports than for imports into Canada. The value of Canadian beef exported (£4,169/t) is higher on average than the UK (£3,890/t), meaning that when fixed costs such as customs declarations and certification are applied on a per shipment basis, the AVEs are higher for a lower value load.

This effect is even more pronounced for lamb, where the export price from Canada surpasses £10,000/t. As Canada is a minor player in sheepmeat, and indeed, is a net importer, this high price is likely to be associated with specialist niche trade. Given that the UK is a net exporter of lamb, particularly in the Northern Hemisphere summer, it is highly unlikely that imports of Canadian sheepmeat will be of any significance in the UK. Canadian and UK-based industry experts acknowledge that exporting lamb to Canada is a definite opportunity for the UK and the reputation of

UK (and EU) lamb is such that it would be positively perceived by Canadian consumers.

The NTM AVEs for dairy products are broadly similar (1.2-1.3%) with the aggregated AVE for Canadian imports being slightly higher due to the lower price per tonne.

As mentioned above, wheat (and barley) trade is dominated by bulk shipments, so that NTM AVEs are approximately 0.1%. Given these low levels of trade barriers and the price competitiveness of Canadian grain, the UK market is seen as a significant opportunity by Canadian wheat exporters.

Once again, potatoes have higher NTM AVEs due to the small shipment size (relative to grain) and the lower price per tonne. Canada has disease issues with seed potatoes in particular. Disease pressure on Canadian commercial grade seed potatoes have curbed Canada's ability to serve the US and Mexican markets. This, in turn, is exerting pressure on its domestic seed potatoes' sector. In such times, it is unlikely that Canada would permit significant volumes of Scottish seed potatoes into the country. Also, Canadian import controls are quite strict as it is seeking to prevent additional disease entering the country. Therefore, industry experts believe that the export potential for Scottish producers is limited.

Table 5-7: NTM AVEs for Canadian Trade across Selected Product Categories

Commodity Category	CA Exports (Imports into UK)		CA Imports	
	Price (£/T)	NTM AVE (%)	Price (£/T)	NTM AVE (%)
Beef	4,169	1.5%	3,890	2.6%
Sheepmeat	10,037	0.9%	4,079	2.3%
Dairy	4,078	1.2%	3,713	1.3%
Wheat	184	0.1%	167	0.1%
Barley	176	0.1%	157	0.1%
Potatoes	404	4.6%	357	5.3%

Source: The Andersons Centre (2022) based on pricing data from UN Comtrade and HMRC

Note: prices per tonne are aggregated and weighted by the amount of trade taking place for each HS code within the commodity category.

5.3.4 UK - GCC

As UK trade with GCC countries is currently based on WTO Most-Favoured Nation (MFN) conditions, the NTM AVEs presented below are based on the higher end of the NTM costs spectrum vis-à-vis the estimates presented for NZ and Canada who benefit from veterinary deals with the UK. As noted in Chapter 4, agri-food exports

from the GCC are small, but the region is a significant net-importer and viewed by some as offering opportunities to the UK and Scotland.

For beef, as mentioned in Chapter 4, the biggest NTM issue for UK exporters concerns Halal certification and the fact that British retailers do not permit Halal slaughtering in the premises that they procure from. Therefore, whilst the aggregated NTM AVE for beef exports from the UK to the GCC is estimated at 7.2%, in effect, large swathes of the supply-chain will not be permitted to participate in future exports to the GCC region.

The NTM AVEs for lamb exports from the UK to the GCC are estimated at 5.5%, higher than for Canada. This is mainly because of the requirements around Halal certification and the fact that UK trade with the GCC countries is subject to standard regulatory checks applied on an MFN basis. As alluded to in Chapter 4, there is greater scope for Halal-certified exports of lamb to the GCC from the UK.

The aggregated NTM AVE for dairy products is estimated at 2.5%. This suggests that with the significant levels of exports currently taking place any enhanced access to the region should present further opportunities for Scottish dairy products' exporters.

As with other regions, the NTM AVEs for wheat and barley are minimal, but opportunities for UK exporters are likely to be curtailed by more competitive produce emanating from the Black Sea region.

Potato NTM AVEs are estimated at 8.4% for exports to the GCC region. Here, phytosanitary certification features prominently with some suggesting that the requirements in Saudi Arabia have become more stringent recently and may pose a more significant barrier to future exports.

Table 5-8: NTM AVEs for GCC Trade across Selected Product Categories

Commodity Category	GCC Exports (Imports into UK)		GCC Imports	
	Price (£/T)	NTM AVE (%)	Price (£/T)	NTM AVE (%)
Beef	2,929	4.7%	3,074	7.2%
Sheepmeat	2,684	5.9%	4,282	5.5%
Dairy	3,140	2.5%	3,536	2.5%
Wheat	708	0.1%	167	0.1%
Barley	580	0.1%	157	0.1%
Potatoes	329	7.2%	380	8.4%

Source: The Andersons Centre (2022) based on pricing data from UN Comtrade and HMRC

Note: prices per tonne are aggregated and weighted by the amount of trade taking place for each HS code within the commodity category.

5.3.5 UK - EU

The UK has not yet imposed full regulatory controls on imports. These controls are now not expected to be fully imposed until the end of 2023, but they will become effective at some point. As such, in the long-term, imports from the EU will be affected by NTMs. This, in turn, will influence the competitiveness of EU imports into the UK market (and UK exports in the opposite direction) meaning that imports from the selected non-EU partners could become more competitive.

Table 5-9 summarises the estimated NTM AVEs for each commodity for UK-EU trade during 2018-2020. Again, further detail is set-out in Annex III. As Chapter 4 illustrates, substantial agri-food trade takes place between the UK and the EU each year. Whilst post-Brexit trade is lower, it is still significant. Accordingly, unlike the non-EU partners where direct trade with the UK is generally lower, and likely to grow and evolve with future FTAs, trade with the EU is unlikely to experience such shifts (unless there is a major trade dispute). Therefore, given the level of trade taking place, it was decided that the NTM AVEs set out below should be based on HMRC pricing data with the EU for each commodity (and associated HS codes) for 2018-2020.

Overall, with the possible exception of sheepmeat, import and export prices on trade with the EU are closely aligned. This reflects the geographic proximity between both markets and the level of trade taking place.

For red meat, the NTM AVEs for UK exports range from 1.8% to 2.3% for beef and sheepmeat respectively. For UK exports to the EU, the NTM AVEs for beef are slightly higher (2.1%) than sheepmeat (1.9%), but this is also a reflection of the higher prices for sheepmeat exports to the EU. Of course, it is important to recall that these NTM AVEs are probability-based. Some shipments will be subject to the full range of regulatory checks and the NTM AVEs for those "unlucky loads" will be significantly higher; surpassing 25% in some cases.

The NTM AVEs for dairy products are very similar and are estimated at 2.0% and 2.2% for UK imports and exports respectively.

As with non-EU partners, NTM AVEs for wheat and barley are negligible in both directions (0.1%) and whilst there is added bureaucracy on UK grain trade with the EU, it is not considered to be a big barrier.

NTM AVEs for potatoes are estimated at 4.5% and 7.1% for UK imports and exports respectively. Of course, seed potatoes are no longer eligible for export from Scotland to the EU. This has been a major challenge for the industry since the TCA became effective. Whilst theoretically, imports of seed potatoes into the UK from the EU should also be ineligible, the UK has permitted some imports to take place. Some industry participants believe that this has created an additional challenge for the Scottish seed potatoes sector.

One industry expert suggested that there are good commercial reasons for UK-EU seed potatoes' trade to continue, particularly given Scotland's high-quality reputation, but whilst there is a willingness from UK and EU producers to address the current restrictions, the political will is not yet there. Industry participants hope that this will change in the long-term but many have been left disappointed with how the industry has been treated since the TCA was agreed.

Table 5-9: NTM AVEs for UK-EU Trade across Selected Product Categories

Commodity Category	EU27 to UK		UK to EU27	
	Price (£/T)	NTM AVE (%)	Price (£/T)	NTM AVE (%)
Beef	3,901	1.8%	3,787	2.1%
Sheepmeat	3,761	2.3%	4,461	1.9%
Dairy	3,173	2.0%	3,307	2.2%
Wheat	172	0.1%	168	0.1%
Barley	164	0.1%	159	0.1%
Potatoes	540	4.5%	346	7.1%

Source: The Andersons Centre (2022) based on pricing data from the HMRC
Note: prices per tonne are aggregated and weighted by the amount of trade taking place for each HS code within the commodity category.

5.4 Concluding Remarks

Taken together, there are substantial trade barriers currently affecting trade between the UK and the selected non-EU partners, particularly in terms of imports into Britain. The FTAs recently announced between the UK and Australia as well as NZ will diminish these significantly over time. It is anticipated that greater market access for Canada will also offer similar levels of access. On the exports' side, trade barriers between the UK and selected non-EU partners are generally lower, with the exception of Canada for dairy products. Long-term, the value for money of Scottish produce vis-à-vis its peers will be the crucial determinant of the Scottish agri-food industry's future success.

6. Comparison Between the Main and Alternative Baselines

Before examining in detail the impact of the selected non-EU FTAs on UK and Scottish agriculture (see Chapters 7 and 8 respectively), this Chapter provides a top-level, long-term, comparison of the Main Baseline and the Alternative Baseline (No-Brexit) scenario results at a UK level.

As set-out in Chapter 1, the **Main Baseline** reflects the continuation of the current situation concerning the UK's trade with overseas partners in the longer-term. In other words, Brexit has occurred with the UK-EU TCA has been applied and roll-over FTAs have been put in place covering the trade deals that the UK was party to when it was an EU Member State.

The Scottish Government in its original ITT, requested top-level insights on how the Scottish agri-food industry (i.e., selected sectors) might have performed had there been no Brexit. Accordingly, an **Alternative Baseline (No-Brexit)** scenario was developed. In this section, a top-level comparison between the Main Baseline and No Brexit scenario is outlined, chiefly focusing on comparing long-term exports, imports and Gross Value Added (GVA) in each selected sector as well as for agri-food generally. This comparison is undertaken at a UK level.

6.1 Baseline Drivers

To conduct long-term modelling on the Main and Alternative Baselines, assumptions are required on the expected rates of growth of exogenous variables, technological progress, land expansion, productivity improvements in feed sectors, and historical changes in trade and CAP policies that need to be considered. These are summarised in Table 6-1 below and constitute the main drivers of the Main and Alternative Baselines.

Table 6-1: Summary of the Main Assumptions in the Baseline Scenarios

Drivers	Description
Macroeconomic	Population growth: Shared Socio Economic Pathways (Scenario 2 (SSP2)) – Medium Variant (Middle of the Road scenario), Historical data from World Bank GDP growth: combination of sources: SSP2, World Bank Indicators Labour supply: based on labour force projections (ILO)
Sectoral Productivity	Land productivity: about 0.5% p.a. based on SSP2 Feed efficiency improvements in livestock sectors (combines drivers of better feed conversion (+) and livestock intensification (-)
Policy Assumptions	Biofuel share (blending targets), CAP budget, Implementing FTA between the EU and Canada
Trade Flows Alignment	Align trade flows in the historical period from COMTRADE
Brexit (Changes in the Main Baseline)	Implement NTM costs for trade between EU and UK (-0.1% ~ -10%) Reduce unskilled labour supply (-2%) Align the UK Global Tariff Lines (increase import tariffs) for the key commodities

Source: WUR

These underlying assumptions are explained in more detail in Annex I (section 1.2.5). At a macroeconomic level, GDP differences between the Main and Alternative Baselines are notable. Between 2019 and 2037, UK GDP growth is estimated to increase by around 37% over this period under the Main Baseline (Brexit) scenario. Under an Alternative Baseline (No Brexit) scenario, GDP growth would have been slightly higher at around 40%.

The other main drivers of change under the Main and Alternative Baseline scenarios were the changes introduced as a result of Brexit. Here, NTM changes introduced into UK-EU trade from January 2021 and detailed in section 5.3.5, were central to the differences between both Baseline scenarios, presented in section 6.2.

As explained in Annex I, a labour supply shock (of -2%) in the UK as a result of the ending of Free Movement, was applied to unskilled labour supply in the MAGNET modelling. This shock resulted in a 7.5% increase in labour costs within agri-food under the Main Baseline vis-à-vis the Alternative (No Brexit) Baseline.

6.2 Comparison Between Both Baselines

Considering the above assumptions, long-term projections of exports, imports and gross value added (assumed here to be a proxy for output in monetary terms) were compiled under both Baselines.

As Table 6-2 shows, long-term projections of UK exports (calculated as a percentage change of 2037 vs 2019) of the key commodities show declining trends, with the exception of barley. The exports' reduction ranges from about -8.3% for wheat to almost -22% for beef. It is clear that the UK's long-run competitiveness is expected to deteriorate, particularly in the meat and dairy. The projections show that Brexit accentuates the declining export trends for the key commodities of animal origin. This is reflected in the differences in the percentage changes between the Alternative Baseline and the Main Baseline. Brexit makes the exports' decline more pronounced, due to the impeded access to the EU market.

The drivers behind the UK's lower competitiveness are largely determined outside of the UK – on the world markets and, more specifically, by the situation on the EU market. Under both the Main and the Alternative baselines, it is projected that the EU will substantially increase imports of beef and sheep meat from Latin America. This region has the most competitive production costs globally. For wheat and dairy, the EU will enjoy a substantial increase in exports (about 30%) which will be mostly targeted to the Sub-Saharan African countries. At the same time, private domestic consumption of wheat and dairy in the EU will increase only moderately, reducing the need for imports. As the EU is a major export market for the UK, this explains the reduction UK's exports of wheat and dairy in the baseline situations.

UK barley exports increase under both the Main (5.1%) and Alternative Baselines (6.5%), with increases being more pronounced for the latter. The extent to which Scottish barley exports will feature will be contingent on demand within the Scottish whisky industry.

Table 6-2: Projected Long-Term UK Agri-Food Exports under Both Baseline Scenarios (£m)

Sector	2019 (£m)	2037 Main Baseline (£m)	% Change vs 2019	2037 Alternative Baseline (£m) (No Brexit)	% Change vs 2019
Wheat	148	136	-8.3%	133	-10.1%
Barley	245	258	5.1%	261	6.5%
Dairy	1,481	1,218	-17.8%	1,289	-13.0%
Beef	476	372	-21.8%	388	-18.6%
Sheepmeat	526	449	-14.7%	471	-10.5%
Agri-food total	23,193	23,311	0.5%	25,410	9.6%

Sources: Wageningen University and Research (WUR) and Andersons

Note: all estimates are based on real-terms (2019) prices for the 2019 to 2037 forecast period.

Table 6-3 shows long-term trends in UK's imports. The projected growth rates are comparable across the commodities, with an expected increase in imports of around

14% under Brexit, and 18% without Brexit. As seen above, the UK-EU TCA trade deal creates some distortion for trade between the EU and the UK. This is particularly due to NTMs, which reduce the UK's competitiveness in the EU market and reduce trade volumes (both exports and imports) whilst increasing domestic production, ceteris paribus (i.e., all other things being equal).

Table 6-3: Projected Long-Term UK Agri-Food Imports under Both Baseline Scenarios (£m)

Sector	2019 (£m)	2037 Main Baseline (£m)	% Change vs 2019	2037 Alternative Baseline (£m) (No Brexit)	% Change vs 2019
Wheat	251	288	15.0%	316	26.0%
Barley	476	563	18.4%	557	17.0%
Dairy	3,583	4,080	13.9%	4,275	19.3%
Beef	957	1,098	14.7%	1,179	23.1%
Sheepmeat	296	346	16.9%	337	13.6%
Agri-food total	52,190	59,471	14.0%	61,773	18.4%

Sources: Wageningen University and Research (WUR) and Andersons
Note: all estimates are based on real-terms (2019) prices for the 2019 to 2037 forecast period.

Table 6-4 shows projected changes in Gross Value Added (GVA). In line with the decline of exports, GVA is also expected to decline, with largest declines observed for sheepmeat, barley and wheat[2].

For some sectors (e.g., wheat, barley, dairy, beef), the effect of Brexit has led to a less pronounced GVA decline. This is because by reducing trade with the EU, British consumers' reliance on domestic production slightly increases, leading to a moderately positive production effect (compared to the no-Brexit situation). This is very much related to the interruptions in trade between the EU and UK and the necessity to reorientate food processing from imports to domestic industry. Similar conclusions were found in Bartelings and Smeets Kristkova (2022)[9] who studied the impact of Brexit on fisheries.

Regarding sheep, the negative impact of Brexit is related to the slightly lower tariffs applied by the UK compared to the EU that make imports more attractive. In

[2] It is important to note here that unlike gross value added, which is expected to decline in longer-term as a reflection of increased costs of production factors and their employment in other sectors of the economy, total volume of agricultural production is expected to increase due to productivity improvement and use of other inputs.

addition, the NTMs imposed on UK sheepmeat exports to the EU, traditionally accounting for 25-40% the UK lamb crop are also important.

Table 6-4: Projected Long-Term UK Agri-Food GVA under Both Baseline Scenarios (£m)

Sector	2019 (£m)	2037 Main Baseline (£m)	% Change vs 2019	2037 Alternative Baseline (£m)	% Change vs 2019
Wheat	2,281	2,107	-7.6%	2,087	-8.5%
Barley	825	760	-7.8%	759	-8.0%
Dairy	2,030	1,893	-6.8%	1,856	-8.6%
Beef	3,059	3,045	-0.5%	3,004	-1.8%
Sheepmeat	532	488	-8.2%	496	-6.7%
Agri-food total	60,763	60,471	-0.5%	59,688	-1.8%

Sources: Wageningen University and Research (WUR) and Andersons

Note: all estimates are based on real-terms (2019) prices for the 2019 to 2037 forecast period.

7. FTA Impact Assessments

This Chapter summarises the results of the CGE (MAGNET) modelling as regards the selected non-EU FTAs. It draws upon the inputs, particularly concerning trade barriers, presented in previous Chapters. Given the main focus of this study, section 7 assesses the impact of FTAs with the selected non-EU partners. These analyses are undertaken at a UK level as that is the basis on which the MAGNET modelling was conducted. Chapters 8 and 9 then look in detail at the impact of these FTAs on Scottish farming and the implications for the Scottish agri-food more generally.

7.1 FTA Impact Assessment by Sector

This section gives an overview of the projected impacts of the selected non-EU FTAs on each agri-food sector within scope. For each sector, findings from the MAGNET modelling are firstly set-out. Thereafter, primary research insights are also outlined for each sector. Additional commentary on what the results mean for the UK and Scottish agri-food and farming are provided in sections 8.3 and 8.4 respectively.

7.1.1 Wheat

MAGNET Modelling Findings

The impact of trade liberalisation on wheat exports is positive (see Table 6-4) which indicates a potential comparative advantage of the UK in trade with the selected non-EU partners (focus countries). Under the low-liberalisation scenario, total UK wheat exports could increase from £135 million in the Main Baseline to £150 million

in the Low Liberalisation scenario and up to £165 million in the High Liberalisation counterpart. This represents percentage increases ranging from 11% - 22%.

Looking more closely at the situation with individual trading partners, the increase in global wheat exports is driven mostly by Canada, where total exports would rise by between 12% to 26%. On the other hand, an FTA with the GCC would lead to a moderate decline in the UK's global wheat exports (there are some substitution effects among the individual focus countries).

Table 7-1: Long-Term Changes to Total UK Wheat Exports Resulting from Selected FTAs

Parameter	Main Baseline (£m)	FTA (Low Lib) (£m)	Change (£m)	% Change	FTA (High Lib) (£m)	Change (£m)	% Change
Wheat Exports	135.6	149.8	+14.2	+10.5%	165.0	+29.4	+21.7%
Of which:							
Australia			+1.2	+0.9%	Australia	+2.5	+1.8%
New Zealand (NZ)			+1.2	+0.9%	NZ	+2.4	+1.8%
Canada			+16.3	+12.0%	Canada	+35.7	+26.3%
GCC			-4.5	-3.3%	GCC	-11.1	-8.2%

Sources: Wageningen University and Research (WUR) and Andersons

Note: the changes listed for each FTA partner represent the change in total UK wheat exports (to all countries) as a result of the application of an FTA with the partner listed. For instance, a UK FTA with Australia would increase total UK exports by £1.2m in the Low Liberalisation, equating to 0.9% of Baseline UK wheat exports (£135.6m). Again, all values are quoted in real-terms (2019 prices).

Trade liberalisation also produces increased volumes of wheat imports. The magnitudes are substantially larger - imports would increase between 50% to 100% with the largest shipments coming from Canada. It is important to note that this substantial increase of trade volume, particularly of imports, owes to the elimination of import tariffs which are reinstalled in the Main Baseline due to Brexit. It also shows that Canada has a long-term competitive advantage in trade in wheat. With an enhanced FTA, it could play an important role as a supplier of wheat to the UK, even under a parallel increase of wheat exports from the UK. The fact that UK can increase both exports and imports can be explained by the heterogeneity of products in the aggregate commodity group. It can also be explained by the modelling approach which uses the Armington assumptions (i.e., there is no perfect substitution between domestic and imported good) which prevents a commodity only being supplied domestically or only traded externally.

Table 7-2: Long-Term Changes to Total UK Wheat Imports Resulting from Selected FTAs

Parameter	Main Baseline (£m)	FTA (Low Lib) (£m)	Change (£m)	% Change	FTA (High Lib) (£m)	Change (£m)	% Change
Wheat Imports	288.4	432.6	+114.2	+50.0%	597.5	+309.1	+107.2%
Of which:							
Australia			+10.2	+3.5%	Australia	+22.6	7.8%
New Zealand (NZ)			-1.5	-0.5%	NZ	-3.6	-1.3%
Canada			+129.6	+44.9%	Canada	+274.4	95.1%
GCC			+5.9	+2.1%	GCC	+15.7	5.4%

Sources: Wageningen University and Research (WUR) and Andersons
Note: all estimates are based on real-terms (2019) prices for the 2019 to 2037 forecast period.

Looking at the GVA, the impacts of FTAs on wheat production are moderately negative. Declines of between 2.7% and 5.9% are projected over the forecast period (2019-2037). This is due to increased imports of wheat and a possible substitution of domestically produced wheat by imported wheat in the UK's intermediate and final consumption.

Table 7-3: Long-Term Changes to UK Wheat GVA Resulting from Selected FTAs

Parameter	Main Baseline (£m)	FTA (Low Lib) (£m)	Change (£m)	% Change	FTA (High Lib) (£m)	Change (£m)	% Change
Wheat GVA	2,107.1	2,051.3	-55.9	-2.7%	1,983.3	-123.9	-5.9%
Of which:							
Australia			-3.8	-0.2%	Australia	-8.8	-0.4%
New Zealand (NZ)			+0.5	0.0%	NZ	+0.8	0.0%
Canada			-49.2	-2.3%	Canada	-106.5	-5.1%
GCC			-3.5	-0.2%	GCC	-9.5	-0.4%

Sources: Wageningen University and Research (WUR) and Andersons
Note: all estimates are based on real-terms (2019) prices for the 2019 to 2037 forecast period.

Primary Research Findings:

- **Imports:** there is likely to be increased wheat imports from Canada arising from an enhanced FTA but the aggregated impacts of the selected FTAs will be limited according to industry experts. Canadian-based industry participants see increased wheat sales to the UK as a definite opportunity and believe that potential issues around GMOs can be overcome.
- **Exports:** given the UK and Scotland's relatively high-costs of production versus grain from the Black Sea (when it is available to ship), export opportunities to the GCC region are anticipated to be limited. Whilst Brexit has made exporting to the EU somewhat more difficult, it remains much easier to ship wheat to Germany where relationships and trust are well-established than to the Middle East where buyers are heavily price-focused and relationships are not as established.
- **Prices:** there is an acknowledgement amongst interviewees that Canadian wheat prices are more competitive than Scottish/UK prices for wheat of comparable quality. Although shipping costs have increased significantly, industry participants anticipate some downward price pressure. Whilst Australia also produces and exports wheat, industry experts believe its impact will be limited due to the distances involved.
- **Output:** the general consensus is that there would be very limited direct impacts on production arising from the FTAs. That said, the indirect impacts of new FTAs on beef, sheepmeat and dairy give some causes for concern.
- **Short-term issues and concerns:**
    - **Input cost inflation** and the associated pressures this places on working capital, cashflow and the availability of credit is the biggest short-term concern. Of course, this is primarily linked to the Russia-Ukraine conflict – an issue which is not within the scope of this study. Whilst output prices have also been rising, buyers are not committing to long-term purchases, which is making the prospects for 2023 challenging to predict.
    - **Labour availability:** is not seen as a major issue in the grain sector particularly when compared to more labour-intensive sectors like potatoes and fruit.
    - **Brexit-related regulation:** the just-in-time nature of supply chains has created challenges for importers arising from Brexit. Whilst regulatory certification per se is not expensive for grain, the ability to book a ship at short notice has become more problematic, particularly if it takes 48-72 hours to get a Country of Origin certificate and the density of wheat can mean that the weight of the grain when loaded is different to what is on the

customs declaration. Overall, these issues are not deemed to be insurmountable but have created some supply-chain disruption.

- **Long-term issues and concerns:** issues related to **CO_2 emissions** are becoming more important as processors are increasingly focused on how to achieve net-zero. This could create some scope for locally-produced wheat in the future, but the demand placed on farmers to lower their CO_2 emissions could also create further financial strain.

7.1.2 Barley

MAGNET Modelling Findings

Similar to wheat, the selected non-EU FTAs also produce an increased exports in "other grain" (which as explained in section 2.2 is used as a proxy for barley given that it is the main "other grain" being traded by the UK). In monetary terms, exports increase from £258 million in 2019 up to £280 million under a High Liberalisation scenario (Table 7-4). This represents an increase of 8.4%. Next to Canada, other trading partners of potential importance to the UK's barley's exports are the GCC countries, with exports absolute increase of £9 million (+4%).

Table 7-4: Long-Term Changes to Total UK Exports of Other Grain Resulting from Selected FTAs

Parameter	Main Baseline (£m)	FTA (Low Lib) (£m)	Change (£m)	% Change	FTA (High Lib) (£m)	Change (£m)	% Change
Other grain exports	258.1	269.1	+11.0	+4.3%	279.8	+21.7	+8.4%
Of which:							
Australia			+0.3	+0.1%	Australia	+0.5	+0.2%
New Zealand (NZ)			+0.7	+0.3%	NZ	+1.4	+0.5%
Canada			+4.8	+1.9%	Canada	+9.9	+3.8%
GCC			+5.2	+2.0%	GCC	+9.9	+3.9%

Sources: Wageningen University and Research (WUR) and Andersons

Note: all estimates are based on real-terms (2019) prices for the 2019 to 2037 forecast period.

Interestingly, in contrast to wheat, trade liberalisation does not lead to an increase of imports of other grain, the only exception being the GCC. This suggests that the focus countries do not specialise substantially on trading other grain with the UK. Thus, the UK could increase its net export position due to trade liberalisation.

Table 7-5: Long-Term Changes to Total UK Imports of Other Grain Resulting from Selected FTAs

Parameter	Main Baseline (£m)	FTA (Low Lib) (£m)	Change (£m)	% Change	FTA (High Lib) (£m)	Change (£m)	% Change
Other grain imports	563.5	563.0	-0.5	-0.1%	561.0	-2.5	-0.4%
Of which:							
Australia			+0.1	+0.0%	Australia	+0.2	+0.0%
New Zealand (NZ)			-0.8	-0.1%	NZ	-1.6	-0.3%
Canada			-4.2	-0.7%	Canada	-10.8	-1.9%
GCC			+4.4	+0.8%	GCC	+9.7	+1.7%

Sources: Wageningen University and Research (WUR) and Andersons
Note: all estimates are based on real-terms (2019) prices for the 2019 to 2037 forecast period.

In line with the developments in trade, other grain GVA would see an increase, ranging from £1.8 million £2.3 million over the forecast period; however, in relative terms, this is rather marginal (about 0.3%). The GCC countries would play the largest role in this GVA increase.

Table 7-6: Long-Term Changes to UK Other Grain GVA Resulting from Selected FTAs

Parameter	Main Baseline (£m)	FTA (Low Lib) (£m)	Change (£m)	% Change	FTA (High Lib) (£m)	Change (£m)	% Change
Other grain GVA	760.2	762.0	+1.8	+0.2%	762.5	+2.3	+0.3%
Of which:							
Australia			-0.1	-0.0	Australia	-0.4	+0.0
New Zealand (NZ)			+0.2	+0.0	NZ	+0.3	+0.0
Canada			-0.6	-0.1	Canada	-1.6	-0.2
GCC			+2.2	+0.3	GCC	+4.0	+0.5

Sources: Wageningen University and Research (WUR) and Andersons

Note: all estimates are based on real-terms (2019) prices for the 2019 to 2037 forecast period.

Primary Research Findings:

- **Imports:** the selected FTAs are unlikely to lead to any significant increases in barley imports. Where imports might arise will be for niche varieties of malting barley (e.g. from Scandinavia) which are required by the whisky distilling industry.
- **Exports:** given the high-value of Scotch whisky, any exportable surplus of Scottish malting barley is unlikely to be shipped overseas and will instead be used domestically. Therefore, direct barley exports are not expected to increase to a significant degree. That said, there might be small opportunities for UK exports of malt to increase to the likes of the GCC (e.g. UAE) but most of these opportunities would arise for maltsters in the South East of England.
- **Prices:** the feedback from industry experts is broadly similar to wheat insofar that the price impact of the FTAs would be limited, especially for Scottish barley due to the strong malting barley demand from whisky distilleries. Therefore, the future trajectory of prices will be heavily linked to the market opportunities for Scotch whisky sales both domestically and overseas.
- **Output:** significant investment in additional malting capacity is taking place in Scotland. One industry participant suggested a net 170Kt capacity increase in the coming years. This should have a positive impact on malting barley output. Within the feed sector, there are concerns (as with wheat) about the indirect impact of FTAs on demand for feed for grazing livestock. Overall, at a UK-level the impact on barley output as a result of the FTAs is anticipated to be limited.
- **Short-term issues and concerns:** are similar to those outlined above for wheat.
- **Long-term issues and concerns:** again, these are broadly similar to the points above for wheat although it is arguable that environmental issues are even more prevalent for whisky distilleries. In terms of **CO_2 emissions**, it is anticipated that these distilleries will be expected to achieve sizeable carbon offsets and this could create some pressure on land-use for farming in Scotland. The availability of peat which is crucial for processes used by several whisky distilleries is also a challenge given the environmental issues that arise through the harvesting of peat.

7.1.3 Dairy

MAGNET Modelling Findings

The MAGNET modelling forecasts that the UK's dairy sector would see the largest positive gains from trade liberalisation with the selected FTA partners. Total exports could increase from £1.22 billion to nearly £2.27 billion over the forecast period, i.e. an 86% increase (Table 7-7). This substantial growth is particularly driven by increased exports to the GCC countries. However, Canada and Australia also contribute to this positive balance according to the MAGNET modelling. Putting this in the context of a relatively moderate increase in dairy imports (Table 7-8), there is a clear comparative advantage of UK on the dairy market.

Table 7-7: Long-Term Changes to Total UK Dairy Exports Resulting from Selected FTAs

Parameter	Main Baseline (£m)	FTA (Low Lib) (£m)	Change (£m)	% Change	FTA (High Lib) (£m)	Change (£m)	% Change
Dairy Exports	1,217.8	1,560.0	+342.0	+28.1%	2,269.1	+1,051.3	+86.3%
Of which:							
Australia			+54.2	+4.5%	Australia	+164.2	+13.5%
New Zealand (NZ)			+20.8	+1.7%	NZ	+66.4	+5.5%
Canada			+75.7	+6.2%	Canada	+220.7	+18.1%
GCC			+191.5	+15.7%	GCC	+599.9	+49.3%

Sources: Wageningen University and Research (WUR) and Andersons

Note: all estimates are based on real-terms (2019) prices for the 2019 to 2037 forecast period.

Table 7-8: Long-Term Changes to Total UK Dairy Imports Resulting from Selected FTAs

Parameter	Main Baseline (£m)	FTA (Low Lib) (£m)	Change (£m)	% Change	FTA (High Lib) (£m)	Change (£m)	% Change
Dairy Imports	4,081.4	4,140.4	+58.9	+1.4%	4,248.7	+167.3	+4.1%
Of which:							
Australia			+2.6	+0.1%	Australia	+8.6	+0.2%
New Zealand (NZ)			+28.9	+0.7%	NZ	+82.9	+2.0%
Canada			+2.0	+0.1%	Canada	+9.2	+0.2%
GCC			+25.4	+0.6%	GCC	+66.6	+1.6%

Sources: Wageningen University and Research (WUR) and Andersons

Note: all estimates are based on real-terms (2019) prices for the 2019 to 2037 forecast period.

The positive developments on the foreign markets are transmitted to an increased GVA in the UK dairy sector (see Table 7-9). The projected increases range from £57 million (Low Liberalisation) to £170 million under the High Liberalisation scenario. The GCC countries would be the largest contributors to this increase. The impacts on the GVA in dairy are in lower magnitudes compared to the developments in trade, which suggests that there may be a reduction of supplies of dairy on domestic markets to compensate for the increase of supplies to foreign markets. The increased dairy imports from New Zealand in particular would also have a role to play in reduced UK supplies.

Table 7-9: Long-Term Changes to UK Dairy GVA Resulting from Selected FTAs

Parameter	Main Baseline (£m)	FTA (Low Lib) (£m)	Change (£m)	% Change	FTA (High Lib) (£m)	Change (£m)	% Change
Dairy GVA	1,892.6	1,949.5	+56.9	+3.0%	2,062.9	+170.3	+9.0%
Of which:							
Australia			+10.5	0.6%	Australia	+31.0	1.6%
New Zealand (NZ)			-3.8	-0.2%	NZ	-10.4	-0.6%
Canada			+15.7	0.8%	Canada	+43.9	2.3%
GCC			+34.5	1.8%	GCC	+105.8	5.6%

Sources: Wageningen University and Research (WUR) and Andersons
Note: all estimates are based on real-terms (2019) prices for the 2019 to 2037 forecast period.

Primary Research Findings:

- **Imports:** most industry participants foresee some increased imports from NZ although there are varying views on the extent of this threat. Some perceive it to be relatively high in the long-term, particularly if geopolitical tensions with China hit export sales to Asia. However, other industry participants believe that environmental constraints will inhibit NZ dairy exports in the future. Environmental constraints are also a challenge for the Australian dairy industry and industry experts believe that these constraints will limit its ability to export to the UK to a few select niches.
- **Exports:** most industry participants agreed that the GCC region presents lucrative export opportunities. However, as one GCC-based participant emphasised, opportunities for high-end exports are limited to approximately 30% of the market in Saudi Arabia, Qatar and the UAE. The remaining 70% of

the market (and this percentage will be higher in Oman) is very price-focused and will present limited opportunities. Accordingly, the consensus is that opportunities in the GCC region will need to be focused on high-end niches for products such as cheese and yoghurts, some of which will need to be air-freighted into the region.

Whilst Canada is seen by industry participants as a high-end market with a rising population, it is also highly protectionist. Therefore, in contrast to the MAGNET modelling industry experts believe that export opportunities for the UK are likely to be limited to some high-end niches. Industry participants would welcome an increased TRQ for dairy exports into Canada but noted that concessions to the EU were small in the CETA deal and minimal to the UK in the recent roll-over trade deal. The Canadian quota system is also notoriously complex and a few organisations exert a lot of control. Therefore, most see dairy export opportunities as being low.

- **Prices:** the FTAs with non-EU partners are not anticipated to have a major impact on dairy prices. This is partly because the UK liquid milk market is insulated from import competition to a large degree. That said, all interviewees noted the competitive threat posed by New Zealand and most think that this will create some downward price pressure. However, some noted that market opportunities for NZ dairy produce across Asia should limit this impact.
- **Output:** at a UK level, the volume of output is not anticipated to change that significantly as a result of new FTAs. What is more likely to happen is that the UK reorientates its production activities away from the less profitable lines (e.g. milk powder) and towards more lucrative segments such as cheese production. This should also present increased export opportunities. These increases are mainly coming from incremental investments on existing sites. From a Scottish perspective, the fact that a significant proportion of its milk output is processed in England will mean that the costs of transporting this milk southwards will have a major bearing on future Scottish milk output.
- **Short-term issues and concerns:**
    - **NTM issues:** were cited by several industry participants as being a key challenge in the GCC region. This is especially so with Qatar which has recently introduced stringent minimum and maximum shelf-life requirements which have effectively shut-out imports and protected its domestic sector. There are also NTM issues with Saudi Arabia which threatened to introduce similar restrictions as Qatar but pulled back when the EU protested. Some industry participants also cited issues with Saudi

packaging requirements in the past and that these are likely to arise again in the future.

- **Labour and logistics costs:** have hit parts of the dairy industry particularly in terms of the availability and cost of HGV drivers where costs have risen by up to 30%. Both the ending of Free Movement and the Covid-19 pandemic have been the key drivers of this increase. Whilst labour cost rises across the dairy industry are generally much less, it has created supply-chain pressures. Although most acknowledge that exposure to migrant labour is relatively limited in the Scottish dairy sector.
- **Other inflationary pressures:** were also highlighted by dairy processors with most cost lines being exposed to inflation in recent months. At the farm-level, these effects are even more pronounced in some areas, particularly fertiliser and feed.

- **Long-term issues and concerns:** as with cereals, **environmental sustainability** issues are also becoming higher on the agenda in the dairy sector. Industry participants also mentioned the potential that could arise from **longer-term trade deals** with India (again within high-end niches) and as a result of the UK joining the CPTPP. Regarding the latter, one interviewee noted that although Australia and NZ are already CPTPP members, the UK will not be required to give additional concessions. However, the remaining CPTPP countries that the UK does not have a trade deal with are net importers and this should present long-term export opportunities.

7.1.4 Beef

MAGNET Modelling Findings

The impacts of the considered FTAs on beef exports are positive (see Table 7-10), with the value of exports in 2037 projected to rise from £372 million in the Main Baseline to £437 million GBP in the Low Liberalisation scenario and £582 million under High Liberalisation. This represents a 17% to 57% increase depending on the Main Baseline. FTAs with Canada (£117 million) and the GCC countries (£82 million) would be the most important contributors to this increase in total beef exports, based on the MAGNET modelling. However, for the latter, as emphasised below in the primary research findings, increased exports to the GCC will be contingent on meeting Halal requirements. As explained below, this will be a challenge for the Scottish beef industry.

Table 7-10: Long-Term Changes to Total UK Beef Exports Resulting from Selected FTAs

Parameter	Main Baseline (£m)	FTA (Low Lib) (£m)	Change (£m)	% Change	FTA (High Lib) (£m)	Change (£m)	% Change
Beef Exports	372.1	436.3	+64.1	+17.2%	582.6	+210.5	+56.6%
Of which:							
Australia			+2.3	0.6%	Australia	+7.0	1.9%
New Zealand (NZ)			+1.5	0.4%	NZ	+4.0	1.1%
Canada			+38.0	10.2%	Canada	+117.3	31.5%
GCC			+22.2	6.0%	GCC	+82.2	22.1%

Sources: Wageningen University and Research (WUR) and Andersons
Note: all estimates are based on real-terms (2019) prices for the 2019 to 2037 forecast period.

It is apparent that there is room not only to increase UK exports of beef but that beef imports into the UK could also rise (see Table 7-14). The magnitude of the increases in imports (between +26% to + 61%) are comparable to those of exports presented in Table 7-10. However, for imports, Australia and New Zealand are projected to lead in taking advantage of the liberalised UK beef market. In the case of Australia, UK's imports would increase by 48%, followed by New Zealand (+11%).

Table 7-11: Long-Term Changes to Total UK Beef Imports Resulting from Selected FTAs

Parameter	Main Baseline (£m)	FTA (Low Lib) (£m)	Change (£m)	% Change	FTA (High Lib) (£m)	Change (£m)	% Change
Beef Imports	1,098.3	1,388.8	+290.5	+26.4%	1,766.9	+668.6	+60.9%
Of which:							
Australia			+228.1	+20.8%	Australia	+525.7	+47.9%
New Zealand (NZ)			+58.1	+5.3%	NZ	+131.0	+11.9%
Canada			+0.3	+0.0%	Canada	+1.8	+0.2%
GCC			+3.9	+0.4%	GCC	+10.0	+0.9%

Sources: Wageningen University and Research (WUR) and Andersons
Note: all estimates are based on real-terms (2019) prices for the 2019 to 2037 forecast period.

In terms of GVA, the resulting impacts on the beef processing industry (Table 7-12) are moderately negative. GVA is projected to fall by around 3% in Low-Liberalisation scenario and by 6% under High Liberalisation. The largest contributor to this result would be Australia, due to increased imports of beef. Since the UK voted to leave the EU, Australia has been particularly keen in pursuing a trade deal and increased exports of Australian beef is seen as a key beneficiary.

Table 7-12: Long-Term Changes to UK Beef GVA Resulting from Selected FTAs

Parameter	Main Baseline (£m)	FTA (Low Lib) (£m)	Change (£m)	% Change	FTA (High Lib) (£m)	Change (£m)	% Change
Beef GVA	3,044.9	2,958.7	-86.2	-2.8%	2,858.1	-186.8	-6.1%
Of which:							
Australia			-86.7	-2.8%	Australia	-204.9	-6.7%
New Zealand (NZ)			-22.3	-0.7%	NZ	-51.5	-1.7%
Canada			+14.0	0.5%	Canada	+41.4	1.4%
GCC			+8.8	0.3%	GCC	+28.1	0.9%

Sources: Wageningen University and Research (WUR) and Andersons
Note: all estimates are based on real-terms (2019) prices for the 2019 to 2037 forecast period.

Primary Research Findings:

- **Imports:** the additional scope for imports from Australia and NZ are most likely to supplant imports coming in from Ireland. That said, the scope for Irish exports to be sold elsewhere in the EU will be somewhat limited meaning that significant volumes of Irish beef will continue to be sold in the UK market.

  Canada is also seen by some as posing some threat but much will depend on the standards that the UK agrees to with Canada as part of any enhanced trade deal. At present, if Canada wants to supply the UK its processors have to separate out non-hormone treated beef. This adds costs and limits the interest of Canadian in the UK market.

  Overall, industry participants believe that the volume of UK beef imports will increase to some degree but the extent would be much less than if the UK did a trade deal with the US or Mercosur.

- **Exports:** following on from the previous points, if Irish beef has increased difficulties in finding outlets in the UK, some of this beef will be diverted towards the EU27. This is likely to encroach on existing UK and Scottish

exports to the EU which are now also being impeded by NTMs. Industry participants believe that this will be the biggest export impact for beef.

Looking at the selected non-EU partners, Canada is seen by some as offering the most export opportunity, even if there is also an increased competitive threat of beef imports from Canada. In recent years, exports to Canada have been rising although recent hikes in shipping costs have impeded UK competitiveness. Therefore, any opportunities that do arise will be limited to high-end niches. Scotch beef should be well-positioned to avail of such opportunities given its strong international reputation.

On the face of it, some might think that the GCC also offers export opportunities to the UK; however, its Halal requirements are seen as a major barrier. This is particularly so because UK retailers place stringent requirements on UK meat plants which do not permit non-stun Halal slaughter of cattle. Markets such as Saudi Arabia and the UAE have a strict interpretation of Halal which necessitate non-stun Halal slaughter. As most Scottish and UK processors supply the UK retail sector, they do not want to get involved in non-stun Halal slaughter. Therefore, any export opportunities that do emerge will be restricted to processors that do not supply the retailing sector.

Therefore, there is a consensus that export opportunities for Scotch beef to the GCC will be low.

- **Prices:** most industry participants believe that, for beef, the impacts of the new FTAs on prices will be limited in the long-term, provided that there are no major changes in geopolitical relationships. Here, the potential for friction between Australia and China was cited as a concern. Several participants also highlighted that Australian and NZ beef prices are high presently and that the Asia-Pacific market is more attractive. That said, some believe that any increased imports from Australia and NZ will put pressure on prices particularly in Ireland and a lot will depend on how Irish supply (and exports to the UK) react to this.
- **Output:** from a trade perspective, the threat to long-term UK (and Scottish) beef output is considered to be low and that environmental issues are a much bigger challenge.
- **Short-term issues and concerns:**
    - **NTM issues:** as outlined above, Halal certification is the major impediment in the GCC region. Whilst Canada also has stringent SPS requirements, industry participants believe that Canadian authorities are more flexible and permit some checks to take place away from the border.

- **Labour and logistics costs:** several industry participants cited the ending of Free Movement in January 2021 as having a significant impact on costs and the ability to attract staff. To some degree, this is also linked with Covid but the Brexit influence is significant.
- **Other inflationary pressures:** as with the dairy sector, cost increases throughout the supply-chain have emerged which, if sustained, have the potential to further erode competitiveness.

- **Long-term issues and concerns:**
  - **Environmental sustainability** issues feature prominently given the extent of the GHG emissions challenge in the beef sector. This is particularly so when combined with the potential for land-use change arising from net-zero initiatives.
  - **Support:** the downward trajectory in support payments coupled with the struggling profitability in grazing livestock farming adds further to the beef sector's challenge according to industry experts.
  - **Regulatory standards:** although Australian and NZ standards have some differences to the UK, they are more aligned than the likes of Canada, the US and Brazil. If future trade deals lead to significant changes in what standards the UK is prepared to accept in the future then this could lead to a severe competitive challenge for UK and Scottish producers, particularly if farmers have to adhere to existing standards whilst imports, produced to a different standard, can enter the UK.
  - **Lack of new entrants:** is closely linked with poor profitability and is viewed by some as a major long-term threat to the beef industry.

7.1.5 Sheep

MAGNET Modelling Findings

As regards sheepmeat exports (see Table 7-13), trade liberalisation with the focus countries also presents opportunities. In 2037, sheepmeat exports could increase from £449 million in the Main Baseline to £498 million in a Low Liberalisation scenario, with the potential to increase to £570 million under High Liberalisation. FTAs with each selected country would each have a positive contribution towards the increase in exports. In the High Liberalisation scenario, an FTA with New Zealand would increase exports by 10.7% based on the MAGNET modelling. Similar to the effect that an FTA with Canada has on wheat, an FTA with NZ will lead to increased imports (see Table 7-14) and some of the sheepmeat previously sold domestically will be sold overseas as a result.

FTAs with Canada and the GCC are projected to increase UK lamb exports by 8% and 6.6% respectively. Further insights on these opportunities are provided in the primary research findings section below.

Table 7-13: Long-Term Changes to Total UK Sheepmeat Exports Resulting from Selected FTAs

Parameter	Main Baseline (£m)	FTA (Low Lib) (£m)	Change (£m)	% Change	FTA (High Lib) (£m)	Change (£m)	% Change
Sheepmeat Exports	449.1	498.3	+49.2	+10.9%	569.2	+120.1	+26.7%
Of which:							
Australia			+4.0	+0.9%	Australia	+6.7	+1.5%
New Zealand (NZ)			+28.5	+6.3%	NZ	+48.1	+10.7%
Canada			+9.9	+2.2%	Canada	+35.7	+8.0%
GCC			+6.8	+1.5%	GCC	+29.5	+6.6%

Sources: Wageningen University and Research (WUR) and Andersons
Note: all estimates are based on real-terms (2019) prices for the 2019 to 2037 forecast period.

As alluded to above, trade liberalisation would lead to even more substantial increase in imports, ranging from 50% to 62% as shown in Table 7-14. Australia and New Zealand would be the most significant contributors to this increase. This would have more notable consequences on the domestic production of sheepmeat (Table 7-15) with a projected decline of gross value added of around 10%. This is primarily attributable to increased imports from New Zealand.

Table 7-14: Long-Term Changes to Total UK Sheepmeat Imports Resulting from Selected FTAs

Parameter	Main Baseline (£m)	FTA (Low Lib) (£m)	Change (£m)	% Change	FTA (High Lib) (£m)	Change (£m)	% Change
Sheepmeat Imports	346.5	524.8	+178.3	+51.5%	561.0	+214.5	+61.9%
Of which:							
Australia			+49.6	+14.3%	Australia	+71.6	+20.7%
New Zealand (NZ)			+127.4	+36.8%	NZ	+139.4	+40.2%
Canada			+0.2	+0.1%	Canada	+0.9	+0.3%
GCC			+1.0	+0.3%	GCC	+2.6	+0.7%

Sources: Wageningen University and Research (WUR) and Andersons
Note: all estimates are based on real-terms (2019) prices for the 2019 to 2037 forecast period.

Table 7-15: Long-Term Changes to Total UK Sheepmeat GVA Resulting from Selected FTAs

Parameter	Main Baseline (£m)	FTA (Low Lib) (£m)	Change (£m)	% Change	FTA (High Lib) (£m)	Change (£m)	% Change
Sheepmeat GVA	488.1	436.7	-51.4	-10.5%	433.8	-54.2	-11.1%
Of which:							
Australia			-11.5	-2.4%	Australia	-17.8	-3.6%
New Zealand (NZ)			-45.5	-9.3%	NZ	-57.6	-11.8%
Canada			+3.4	+0.7%	Canada	+11.8	+2.4%
GCC			+2.2	+0.5%	GCC	+9.3	+1.9%

Sources: Wageningen University and Research (WUR) and Andersons
Note: all estimates are based on real-terms (2019) prices for the 2019 to 2037 forecast period.

Primary Research Findings:

- **Imports:** given that Australia and NZ are major sheepmeat exporters, there is a general consensus that imports into the UK will increase. This is especially so for Australia given that it currently has relatively low access to the UK presently via TRQs. For some participants, given the environmental constraints being placed on NZ lamb production coupled with the 114Kt existing TRQ, they believe that import pressure from NZ would be limited in tonnage terms. That said, others believe that NZ will focus on sending more higher value cuts to the UK and that this could have a significant long-term impact on the UK market. One participant stated that the nature of NZ imports had changed in recent decades from carcase-based, frozen lamb and nowadays, high-value legs of lamb and chilled imports are much more prevalent.

  Taking each country individually, industry participants generally think that the competitive threat is at the low-to-medium level. However, taken together, some suggested that the threat level would be raised to medium. This, coupled with a long-term market crash and/or a geopolitical incident with China, would mean a high level of competitive threat to the UK.

- **Exports:** the EU market will remain crucial to the UK and whilst most industry participants think that increased exports to selected non-EU markets will be helpful, some suggest that these markets will be largely incidental.

  Canada is perceived to offer a strong opportunity for the UK, particularly Eastern Canada. Canada is not well-suited to producing lamb and the cultural links with Scotland and the UK more generally should help to build a stronger presence in the market. Some suggest that there may even be opportunities for the UK and NZ to work together to supply year-round spring lamb to the Canadian (and US) markets.

  The GCC is also seen as an opportunity but there are significant Halal-related issues that must be overcome. As mentioned in section 4.3.4, the Demonstration of Life Protocol being put forward by the AHDB is seen by some as a key means to gain traction in the GCC market as it would be much more acceptable to UK retailers who ultimately remain the key customers for Scotch and UK lamb. As with dairy, the key will be to get traction in the higher end of the GCC market as there is also a substantial low-end, low-priced market segment that the UK (Scotland) should not be competing in. Industry participants also anticipate strong competition with Australia and NZ if the UK seeks to exploit the GCC market. Therefore, overall industry experts believe whilst some opportunities can emerge in the GCC they will be relatively small.

  To build exports over the long-term, there were calls for greater investment in a Scotch lamb label because currently there is much greater interest in Scotch beef given its international reputation. Some believe that if there could be a greater emphasis on the sustainability credentials of Scotch lamb that this could be important in building market share overseas.
- **Prices:** whilst the recent downturns in global sheep production has influenced the strong prices of late, some industry participants believe that any notable uptick in sheep production could signify a significant threat, especially in the UK as trade deals with Australia and NZ are applied. Whilst sheep industry participants acknowledge that Australia and NZ are both heavily focused on Asia, some believe that there will be efforts to send more product to the UK. On balance, will exert a downward influence on prices
- **Output:** arising from the increased imports and associated price pressures, most industry participants believe that there will be a downward trend on sheepmeat production. That said, a number of interviewees believe that other factors, particularly associated with tree-planting and land use change will exert more influence, especially in Scotland.

- **Short-term issues and concerns:** are very similar to beef in that inflationary pressures on labour and other inputs are prevalent. **NTM issues** are also similar to beef insofar that Halal certification is a key issue for the GCC, but is more surmountable than beef as the Demonstration of Life Protocol only applies to small animals. Again, the SPS requirements in Canada are similar to those for beef.
- **Long-term issues and concerns:**
    - **Environmental sustainability** the pressures brought about by land-use change in Scotland, specifically in terms of tree planting, are viewed as being an even more potent challenge for sheep (versus beef) given the number of sheep grazed in the upland areas of Scotland. A number of industry participants are concerned about the long-term prospects for sheep numbers in Scotland as a result. One interviewee stated that hill farmers who are about to retire are all going into tree-planting. This in turn is breaks down the Scottish system where upland breeds go to the lowland and this all means that there will be lower volumes of lamb available. Whilst it is acknowledged that regenerative farming could help sheep numbers in some areas, it is a partial mitigation at best.
    - **Lack of new entrants:** was also highlighted regarding sheep, particularly in the uplands as alluded to in the previous point. Poor profitability is also influential and some see these pressures as the greatest long-term threat to the sheep industry.
    - **Support:** given the struggling profitability, commitments to long-term support are seen as crucial by many industry participants.

7.1.6 Potatoes

Whilst the MAGNET CGE Model is comprehensive, it contains insufficient data on the potatoes' sector to permit an analysis similar to that which has been conducted for the other sectors. This is especially so in terms of seed potatoes which are highly important in Scotland. Accordingly, the analysis presented in this study is predicated on an MS-Excel based analysis at the farm-level which is set-out in section 8.4.4.

The remainder of this section focuses on insights from industry experts on the likely impacts of the selected non-EU FTAs on Scottish and UK potatoes. The key points are;

- **Brexit effects:** the UK-EU TCA has made potatoes generally more difficult to ship. This is due to customs costs and phytosanitary regulations in particular. Added to this, shipping costs have increased markedly since 2020. In terms of the general supply of potatoes, there was a small crop in 2020 and looks like

an even smaller crop in 2022, so the market will be tight. Therefore, more of the supply will stay in the UK in the short-term.

For 2021, there is evidence that seed potato plantings were lower due to UK seed potato exports to the EU becoming ineligible for trade. Most industry participants, including those in the EU, agree that UK-EU trade should continue and that the barriers now in place are there for political reasons. That said, Defra has permitted the imports of seed potatoes into England from the EU, so some import trade continues. However, one industry expert suggested that this is an added headwind for the industry when the EU has not reciprocated in permitting UK exports in the opposite direction.

Therefore, in comparison with other sectors, the impact of the UK-EU TCA on the seed potatoes sector has been significant and is set to remain so in the short- to medium-term.

- **Non-EU FTA opportunities:** are generally perceived to be limited with respect to the four selected partners examined in this study.
    - **Australia and NZ:** Given the distances involved, UK FTAs with Australia and New Zealand are anticipated to have minimal impact on Scottish seed potatoes farming.
    - **Canada:** One prominent industry participant thought that export opportunities to Canada will be limited. This is because Canadian growers are already struggling to export to the US due to disease issues and, in such circumstances, it is highly unlikely that the Canadian Government would permit a significant increase in competitive pressure from Scottish exports. Therefore, this interviewee thought that export opportunities for Scotland would not amount to much.
    - **GCC:** exports of Scottish seed potatoes have historically taken place to the likes of Saudi Arabia. As Table 5-2 shows, there are minimal tariffs for seed potatoes into the GCC region, so any additional export opportunities would be predicated on reducing non-tariff measures. Climate is also a big issue in the GCC region as potatoes struggle to grow at temperatures surpassing 30°C.

      In the short- to medium-term much will depend on Egypt's relationship with Russia which has been a big export market for Egypt. If Egyptian exports to Russia struggle due to the conflict and associated sanctions, then the Gulf region would become a key target market for Egypt. This would obviously curtail opportunities for Scottish seed potato exports. Industry feedback suggests that opportunities for potatoes generally in the GCC region would be low

and limited to a few selected niches that would not make a significant difference to Scottish potato production.

- **Other opportunities:** interviewees believed that the US would offer greater potential for Scottish seed potatoes in the longer-term and that export opportunities for high-quality seed potatoes are also likely to exist in the likes of India, East and West Africa. Africa is seen as having notable potential as potato consumption is quite high and geographically Scotland is quite well-positioned to serve some markets, particularly in West Africa.
- **Cost pressures:** were highlighted in a number of discussions.
    - **Labour:** Whilst there is more automation in the picking of potatoes, significant labour is still required for potatoes' grading and the ending of Free Movement has led to labour cost increases.
    - **Other inputs:** current inflationary pressures on the UK economy have affected most cost lines for potatoes, but particularly in terms of fertiliser, energy and packaging. Some suggest that farmers are struggling to get the price increases needed to cover these costs and accordingly margins are suffering.

7.2 Concluding Remarks

The summary of the projected changes in prices, vis-à-vis the Main Baseline, as a result of the FTA scenarios is provided in Table 7-16. It shows UK agri-food prices for the selected commodities are projected to fall due to the flow-on effect of liberalised trade. The strongest decline is expected for wheat (potentially -2.8%). For the other commodities, with the exception of dairy, price decreases of around -1% or less are projected. In general, trade liberalisation would lead to a higher openness and the UK would see increased volumes of both exports and imports in most of the focus commodities versus the Main Baseline. Given the GVA increases in dairy, particularly under the High Liberalisation scenario, it is unsurprising to see some price increases, albeit small.

Table 7-16: Aggregated Long-Term Impact of FTAs on UK Market Prices (£ per Tonne)

Sector	FTA Low Liberalisation	FTA High Liberalisation
Wheat	-1.4%	-2.8%
Barley	-0.4%	-0.6%
Dairy	0.0%	0.2%
Beef	-0.1%	-0.2%
Sheepmeat	-0.8%	-1.0%

Sources: Wageningen University and Research (WUR) and Andersons

From a more broader perspective and considering the developments in the aggregate agri-food sector, it is found that trade liberalisation with Canada, Australia, New Zealand and the GCC countries has positive impacts on trade. That said, the prices and GVA estimates presented above suggest that whilst there will be opportunities in some sectors (most notably dairying), it will signify significant headwinds for others, particularly grazing livestock.

8. Implications for Scottish Agri-Food and Farming

8.1 Introduction

This Chapter examines the potential impacts of the non-EU FTAs on the Scottish food and farming industry. Section 8.2 provides background information on how the Main Baseline results should be interpreted, as these comments are relevant for the subsequent analysis of Scottish agri-food (section 8.3) and farming (section 8.4).

8.2 Interpreting the Main Baseline Results

Caution needs to be exercised in interpreting the Main Baseline results in this Chapter. This is because, the Main Baseline takes account of both Brexit and non-Brexit factors which are expected to influence long-term prices. As a full comparison between Brexit and an alternative, No-Brexit, scenario was not within the scope of this study, the results of the Main Baseline scenario must be viewed in this context.

As alluded to in Chapter 6, and explained in further detail below, the differences between the Main Baseline and the base year are not solely down to Brexit. Indeed, across all commodities, other factors play a much more important role. This includes an erosion of the UK's competitive position for the selected agri-food commodities over the long-term as well as a continuation of the historic trend of reducing real-terms prices for agricultural produce as predicted by the Prebisch-Singer Hypothesis which contends that commodity prices follow a relative downward trend over time[25]. This trend arises due to increased productivity, including increasing yields and technological growth over time. This effect is illustrated in Table 8-1 which shows the long-term commodity price changes under both scenarios versus the Base Year.

Table 8-1: Commodity Price Changes under Main Baseline and Alternative Baselines vs 2019 (%)

Parameter	Wheat	Barley	Dairy	Beef	Sheepmeat
Main Baseline (Incorporating Brexit)	-3.2	-3.4	-5.7	-4.1	-3.6
Alternative Baseline (No Brexit)	-4.5	-4.5	-4.9	-3.0	-2.5

Sources: Wageningen University and Research (WUR) and Andersons

8.3 Implications For Scottish Agri-Food

Taking account of the MAGNET modelling results presented in Chapter 7, this section assesses the implications of the selected non-EU FTAs on the Scottish agri-food industry. This is achieved by taking the projected GVA and pricing impacts by

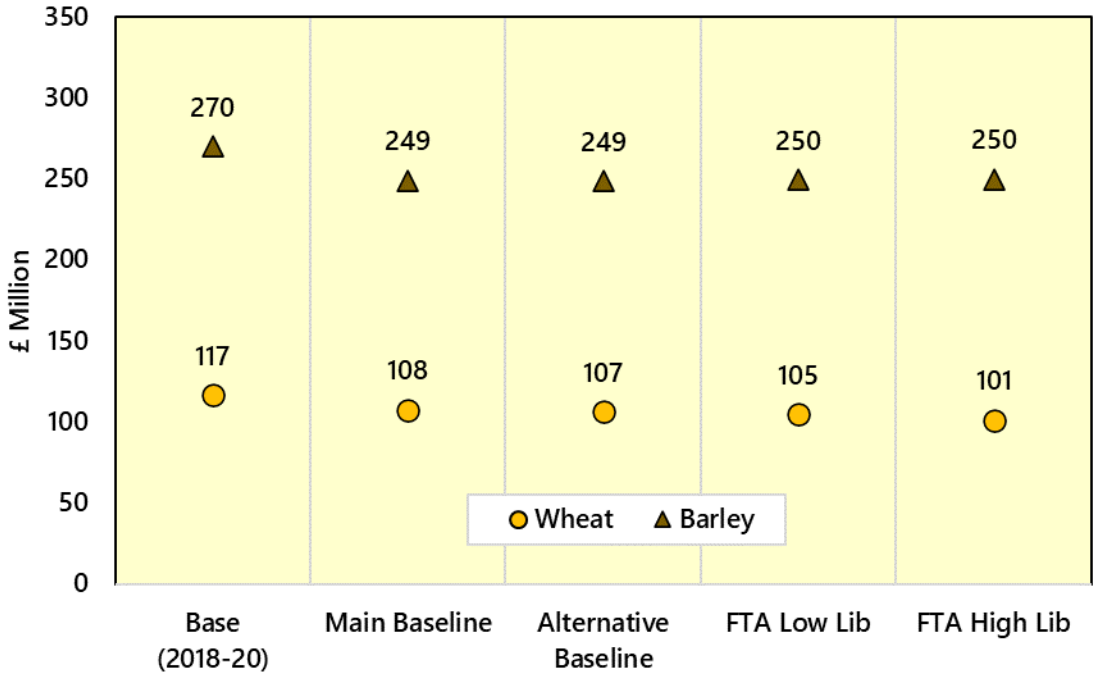
scenario and applying these percentage changes to Scottish output and estimated prices during the 2018 to 2020 period (Base). The 2018 to 2020 Base data is obtained from the Scottish Government's Economic Report on Scottish Agriculture (ERSA) publication. The implications for the potatoes' industry are discussed in the next section.

8.3.1 Cereals

Figures 8-1 and 8-2 compare the estimated long-term impacts of each scenario on Scottish cereals output and production respectively, vis-à-vis the 2018-2020 Base. It shows that there are minimal differences in output, for both wheat and barley, between the Main Baseline and Alternative Baseline. This suggests that the impact of Brexit will be limited in the long term and, if anything, there would have more pronounced production declines, particularly for wheat, had Brexit not occurred.

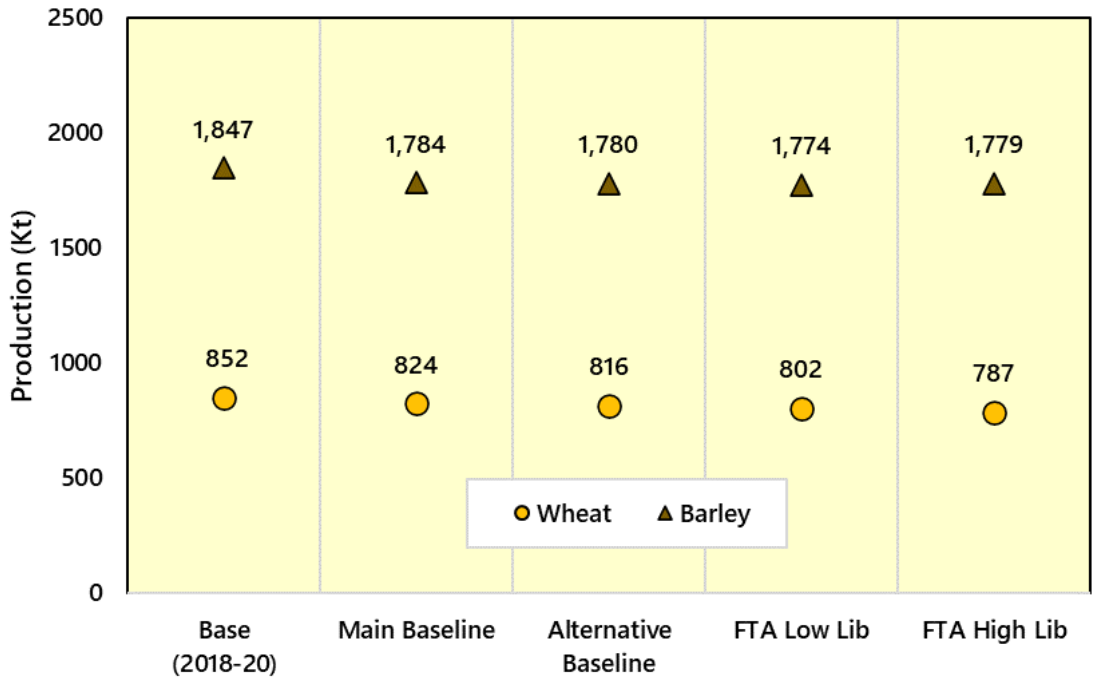
When the non-EU FTAs are factored into consideration in the Low and High Liberalisation FTA scenarios, the monetary value of barley output increases slightly against the Main Baseline. However, against the 2018-2020 Base, the value of both wheat and barley output declines in real-terms, in both scenarios. As explained in Chapter 6 above, this is chiefly due to increased competition from Canadian wheat.

Figure 8-1: Long-Term Effects on Scottish Cereals Output by Scenario (£m - 2019 Prices)



Sources: The Andersons Centre and Wageningen University and Research (WUR)

Figure 8-2: Estimated Long-Term Effects on Scottish Cereals Production by Scenario (Kt)



Sources: The Andersons Centre and Wageningen University and Research (WUR)

8.3.2 Dairy

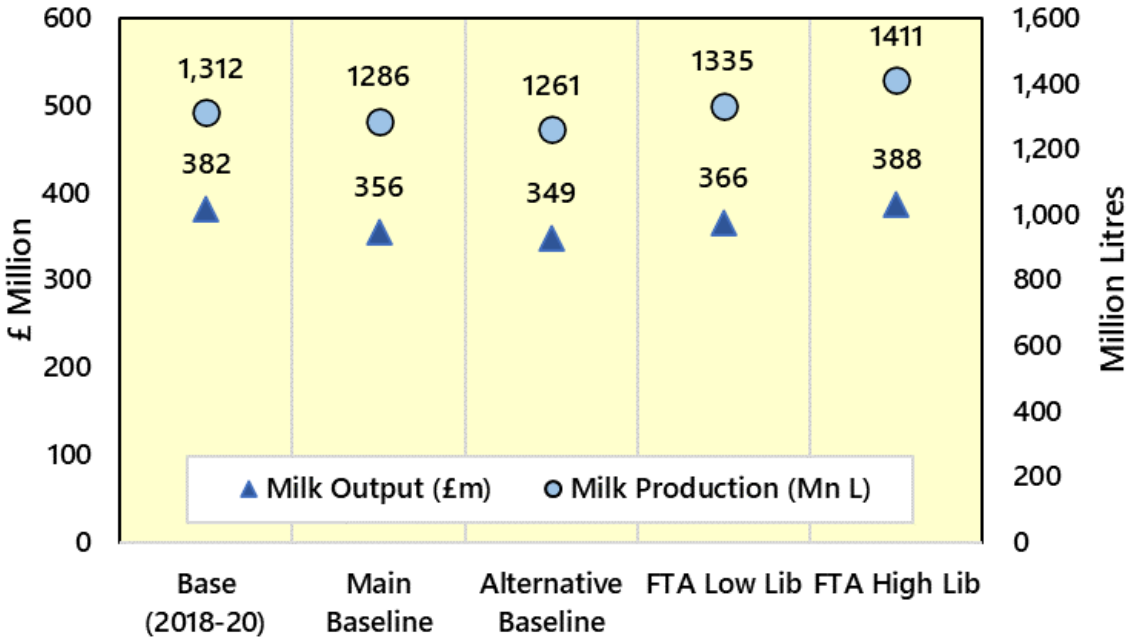
Figure 8-3 summarises the estimates of future Scottish milk production, in both value and volume terms, under the Main and Alternative Baselines as well as the FTA liberalisation scenarios.

Under both the Main and Alternative Baselines, output declines vis-à-vis the 2018-20 Base. However, the decline is more pronounced in the Alternative Baseline. This reflects the projection that increased trade barriers on dairy product imports into the UK from the EU will help the competitive position of UK producers which had been eroded in recent decades when the UK was an EU Member State. This finding is similar to previous studies which did project slight increases in Scottish dairy output due to Brexit[15].

The introduction of FTAs are, on aggregate, anticipated to drive an increase in milk output. In volume terms, Scottish milk production is projected to surpass 1.4 billion litres under the High Liberalisation scenario and the value of output (£388 million) will also be slightly higher (by 1.6%) than the Base. The analysis indicates that the opportunities arising from FTAs, particularly with the GCC, will eclipse the competitive threat that some believe will be posed by NZ. That said, the ability of the

Scottish dairy sector to realise these gains will be predicated on processors' ability to add value to Scottish milk produce. This is because, according to industry participants, many of the opportunities in the GCC region are centred on high value dairy products such as speciality cheese and yoghurt.

Figure 8-3: Estimated Long-Term Effects on Scottish Milk Output (£m) and Production (Kt)



Sources: The Andersons Centre and Wageningen University and Research (WUR)

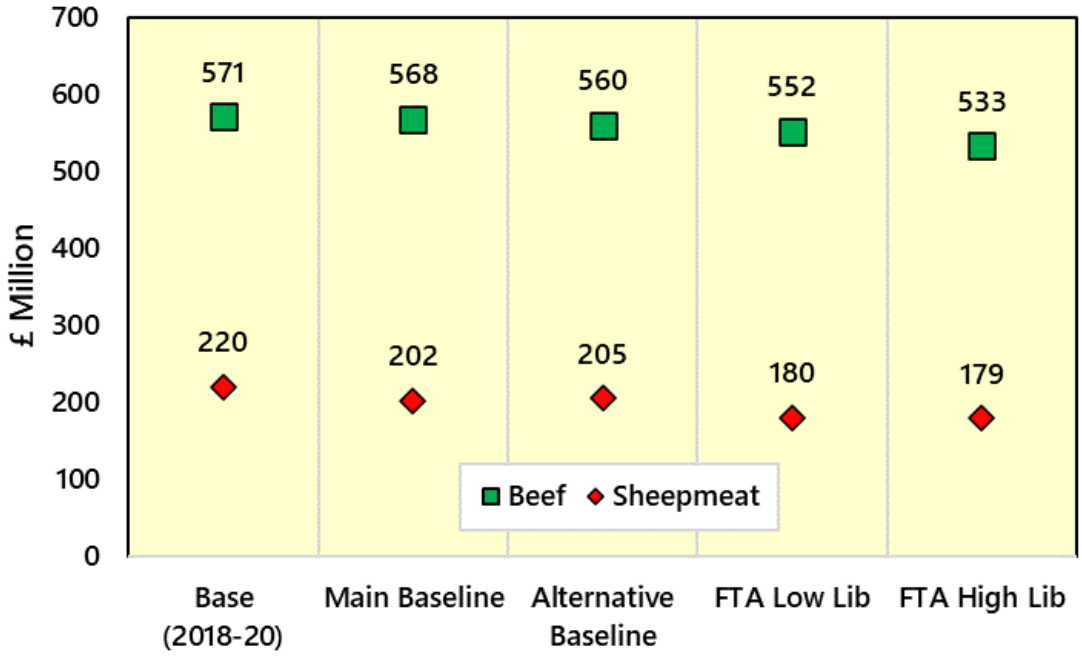
8.3.3 Grazing Livestock

The long-term projections of Scottish beef and sheepmeat output are set-out in Figure 8-4, whilst Figure 8-5 depicts estimated future production in tonnage terms. Under both the Main and Alternative Baselines, the value of beef output is projected to fall by between £8-11 million vis-à-vis the 2018-20 Base. The corresponding value of sheepmeat output is forecast to fall by £15-18 million in the long-term. In contrast to beef, sheepmeat output is slightly higher in the Alternative Baseline versus the Main Baseline. This illustrates the importance of sheepmeat exports to the EU and unhindered access to the Single Market.

In volume terms, Figure 8-5 forecasts that beef production will increase by 2.6% in the Main Baseline. This again suggests that NTMs on imports into the UK from the EU, especially from Ireland, will help the competitive position of Scottish produce. Particularly as Main Baseline production is slightly higher than the Alternative Baseline.

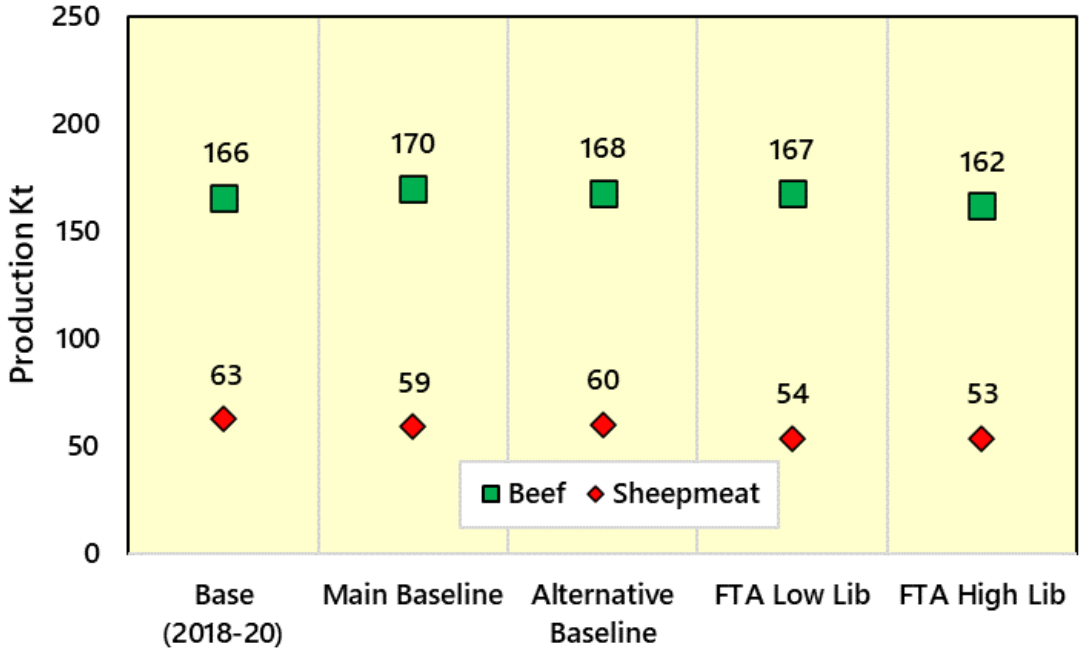
Sheepmeat production also witnesses production declines, by around 5% to 6%, in the Main and Alternative Baselines. The fall is slightly less pronounced in the Alternative Baseline as access to the EU Single Market helps Scottish exports.

Figure 8-4: Long-Term Effects on Scottish Beef & Sheep Output by Scenario (£m - 2019 Prices)



Sources: The Andersons Centre and Wageningen University and Research (WUR)

Figure 8-5: Estimated Long-Term Effects on Scottish Beef & Sheep Production by Scenario (Kt)



Sources: The Andersons Centre and Wageningen University and Research (WUR)

8.4 Farm-Level Implications

This section combines outputs from the MAGNET modelling results on projected prices with the primary research input as well as insights from previous studies and additional MS Excel-based analysis for potatoes. The farm-level assessments have been undertaken using information obtained from the Scottish Farm Business Income (FBI) annual estimates for 2019/20[26] (Base Year). This has been done via a static subtraction from the FBI results and compares the Main Baseline and FTA scenarios to the Base Year. Importantly, the production-related impacts of the FTAs have not been modelled at the farm-level.

8.4.1 Cereals Farming

Relative to other sectors, the projected impact on output prices on Scottish cereal farms arising from Brexit, other non-Brexit factors, and the application of non-EU FTAs is relatively low. A long-term 2.6% decline in cereals output is projected in the Main Baseline. As highlighted previously, this decline is due to a variety of factors including long-term trends in agricultural commodity prices and the relative competitiveness of UK agriculture. These trends were occurring before Brexit. As evidenced by the relatively small differences between output in the Main Baseline and No-Brexit scenario presented in the previous section, Brexit is not the central factor in these output declines.

The increased competitive pressures arising from the new non-EU FTAs, particularly Canada, indicates that prices would decline further, by 3.3% to 3.8% under the Low and High Liberalisation scenarios respectively, versus 2019/20. The results, therefore, suggest that the application of these new FTAs will lead to some additional declines in cereals output.

Costs are also projected to rise over the long-term in the Main Baseline – fertiliser costs are forecast to increase by 8.1%, with crop protection prices rising by around 1%. The application of the non-EU FTAs is not anticipated to lead to any significant changes for fertiliser and crop protection costs. However, seed costs are forecast to decrease as greater trade liberalisation means that the UK will be able to source more cheaply from non-EU sources and with less friction.

Taking the output and cost effects together, crops-specific gross margins are expected to decline by 6.6% under the Main Baseline (versus 2019/20). The declines are forecast to be more pronounced under the Low (-7.5%) and High Liberalisation (-8.1%) scenarios.

A similar picture also emerges when total agricultural output and variable costs are considered across Scottish cereals farms, i.e. when livestock enterprises within Scottish cereals farms are considered. Fixed costs are projected to rise by 0.4% across each scenario and this chiefly reflects the ending of Free Movement and associated

labour cost increases (estimated at 7.5% for full-time labour (and 15% for casual labour)). Labour costs are projected to increase slightly in the FTA scenarios.

In 2019/20, Scottish cereals farms were, on average, already making losses, of nearly £3,000, from their agricultural activities. Given the fall in the monetary value of outputs and cost rises, it is unsurprising that the margin from agricultural production declines further under each scenario. Losses in the region of £10,300 to £11,800 are forecast.

In Table 8-2, agricultural support has been maintained at 2019/20 levels for each scenario. This is crucial to cereals farms being able to generate a positive surplus during each of the comparison scenarios.

Despite this, agricultural business surplus declines by nearly 23% in the Main Baseline scenario and by around 25% to over 27% in the FTA Liberalisation scenarios. This suggests that the long-term future profitability of Scottish cereals farms will be even more heavily reliant on agricultural support.

Table 8-2: Projected Impact of FTA Scenarios (incl. Brexit) on Scottish Cereals Farming (£/Farm)

	19/20 (Base)	Main Baseline		FTAs (Low Lib)		FTAs (High Lib)	
Parameter	**£**	**£**	**% Ch**	**£**	**% Ch**	**£**	**% Ch**
Crops Output (excluding support)	159,517	155,318	-2.6%	154,296	-3.3%	153,489	-3.8%
Crops-Specific Variable Costs	63,517	65,675	3.4%	65,467	3.1%	65,251	2.7%
Crops-Specific Gross Margin	96,000	89,643	-6.6%	88,830	-7.5%	88,238	-8.1%
Total Agricultural Output*	190,524	185,787	-2.5%	184,740	-3.0%	183,905	-3.5%
Total Agricultural Variable Costs*	71,996	74,094	2.9%	73,879	2.6%	73,657	2.3%
Total Agricultural Fixed Costs*	121,516	121,998	0.4%	122,016	0.4%	122,052	0.4%
Total Agricultural Costs	193,512	196,092	1.3%	195,895	1.2%	195,709	1.1%
Agricultural Production Margin	-2,988	-10,305	-244.9%	-11,155	-273.4%	-11,804	-295.1%
Agricultural Support	35,098	35,098	0.0%	35,098	0.0%	35,098	0.0%
Agricultural Business Surplus	32,110	24,793	-22.8%	23,943	-25.4%	23,294	-27.5%

Sources: Scottish Government (Scottish Farm Business Income (FBI) Publication), Andersons and WUR

Note: *Includes both cereals and other farming enterprises (e.g. livestock) on Scottish cereals farms.

8.4.2 Dairy Farming

Table 8-3 summarises the projected long-term farm-level impacts of the non-EU FTAs on Scottish dairy farming, again using averaged data on dairying for 2019/20 from the Scottish FBI publication. Milk output has been separated out from other livestock output (which is dominated by cattle).

As emphasised above, the Main Baseline incorporates both Brexit and non-Brexit effects. Again, based on the findings presented previously (see section 8.3.2), most of the decline in dairy output from 2019 to 2037 is due to factors unrelated to Brexit. That said, the imposition of trade barriers on UK-EU trade erodes the competitiveness of dairy goods imported from the EU and as Table 6-4 shows, thus improving the relative competitiveness of UK and Scottish dairy output.

The analysis forecasts that long-term milk prices under the Main Baseline will drop by 5.7% versus the base year. Given the long-term nature of these projections and the relatively high milk prices in recent years coupled with frequent volatility in milk prices, it is unsurprising that long-term average prices are somewhat lower. When assessing the impacts of the FTAs, changes have only been made to selected output prices (e.g. milk, livestock and crops) and input cost parameters (e.g. fertiliser, animal feed, casual labour and other labour) which have been modelled using MAGNET. Other parameters such as support levels have been kept the same as the 2019/20 base year.

In addition to milk prices, cattle output prices are also projected to fall by 4.1% in the Main Baseline. This means that livestock output is forecast to decline by 5.5% on average.

Livestock output remains broadly the same under both FTA scenarios vis-à-vis the Main Baseline. The greater market access for UK dairy exports to markets such as the GCC means that the milk price decline (-5.5%) is not as pronounced in the High Liberalisation scenario. However, other livestock output declines further in the High Liberalisation scenario due to greater import competition from the likes of Australia and NZ.

A slight decline in livestock-specific variable costs is projected in the Main Baseline, driven chiefly by small reductions in feed and fodder prices. These declines remain largely the same in both FTA scenarios.

This means that, in the long-term, livestock gross margins on Scottish dairy farms are projected to decline by 11.9% vis-à-vis 2019/20 in the Main Baseline. However, the deteriorations are not as pronounced under the FTA scenarios, indicating that the new FTAs will, on aggregate, have a somewhat positive impact on dairy farming.

Fixed costs are anticipated to rise by 1.1% in the Main Baseline scenario. Here, the 7.5% increase in labour costs arising from the ending of Free Movement is

significant. As with cereals, there is a very slight increase in labour costs in the FTA scenarios. Electricity costs are also projected to rise by 4% in the Main Baseline scenario although no additional changes are projected as a result of the non-EU FTAs.

This means that there is nearly a £36,000 swing in the margin from agricultural production on average on Scottish dairy farms in the long-term under the Main Baseline – the positive production margin of just over £22,800 becomes a loss to the tune of over £13,100. As with milk prices, the situation is only alleviated slightly in the FTA scenarios.

Holding support constant, agricultural business surplus is projected to decline by 58% to 60% in the long-term. Again, this illustrates the importance of support to Scottish dairy farm incomes, especially when milk prices decline.

Table 8-3: Projected Impact of FTA Scenarios (incl. Brexit) on Scottish Dairy Farms (£/Farm)

Parameter	19/20 (Base)	Main Baseline	% Ch. vs Base	FTAs (Low Lib)	% Ch. vs Base	FTAs (High Lib)	% Ch. vs Base
Milk Output (excluding support)	526,757	496,731	-5.7%	496,731	-5.7%	497,625	-5.5%
Other Livestock Output (excl. support)	71,108	68,188	-4.1%	68,200	-4.1%	68,082	-4.3%
Total Livestock Output (excl. support)	597,864	564,919	-5.5%	564,931	-5.5%	565,708	-5.4%
Livestock-Specific Variable Costs	293,520	291,230	-0.8%	290,999	-0.9%	290,757	-0.9%
Livestock-Specific Gross Margin	233,237	205,501	-11.9%	205,732	-11.8%	206,868	-11.3%
Total Agricultural Output	620,628	587,438	-5.3%	587,390	-5.4%	588,059	-5.2%
Total Agricultural Variable Costs	330,168	329,966	-0.1%	329,644	-0.2%	329,301	-0.3%
Total Agricultural Fixed Costs	267,653	270,580	1.1%	270,609	1.1%	270,647	1.1%
Total Agricultural Costs	597,821	600,546	0.5%	600,253	0.4%	599,948	0.4%
Margin from Agricultural Production	22,807	-13,108	-157.5%	-12,863	-156.4%	-11,889	-152.1%
Agricultural Support	36,699	36,699	0.0%	36,699	0.0%	36,699	0.0%
Agricultural Business Surplus	59,506	23,591	-60.4%	23,836	-59.9%	24,810	-58.3%

Sources: Scottish Government (Scottish Farm Business Income (FBI) Publication), Andersons and WUR

8.4.3 Grazing Livestock

The Scottish Farm Business Income data is segmented for cattle and sheep farms based on whether farms are categorised as Less-Favoured Area (LFA) or Lowland enterprises. The sections below summarise the "before" and "after" results for both types of farm respectively. The long-term projections, taken to occur 15 years after the non-EU FTAs are applied, simply look at the percentage changes vis-à-vis the Base year (2019/20) for each scenario.

LFA Cattle and Sheep Farms

Table 8-4 summarises the projected long-term farm-level impacts of each FTA scenario for Scottish LFA Beef and Sheep farms. Based on the June 2021 Agricultural Census, it is estimated that there are around 14,850 LFA cattle and sheep holdings in Scotland, over five times the number of lowland cattle and sheep farm holdings (2,700)[27]. The focus is on cattle and sheep farming as well as associated agricultural activities (e.g. ancillary cereals enterprises). In terms of total agricultural output, sheep accounts for the majority (51%) with cattle enterprises accounting for 40%. The remaining 9% is allocated to a range of other small-scale enterprises.

Under both FTA scenarios, livestock output declines by 4.2% to 4.4%. However, the MAGNET modelling indicates that most of this decline (3.8%) occurs in the Main Baseline. Given the size of the sheep enterprise, the sheep price decline of 3.6% is heavily influential, as is the 4.1% decline in beef cattle prices. The application of non-EU FTAs result in further prices declines for sheep. This means that sheep prices are 4.3% to 4.5% lower than the Base Year under the Low and High Liberalisation scenarios respectively. Here, the increased competition brought about by imports from NZ and Australia is the major factor. In contrast, the additional price declines for cattle under each FTA scenario are minimal (i.e., less than 0.2% difference versus the Main Baseline).

Livestock-specific variable costs are not projected to change significantly over the long-term based on the MAGNET modelling. In the Main Baseline, some rises are projected for veterinary and medicines (+5.7%) as the ending of Free Movement has affected the availability of veterinarians and costs have risen accordingly. However, this is offset by declines of around 1.5% in animal feed and fodder costs. Minimal change is also forecast under the other FTA scenarios.

Taking account of the output price declines and the minimal variable cost changes, the livestock specific gross margins are forecast to fall by 7.8% in the Main Baseline, with slightly more pronounced declines of 8.5% to 8.9% under the Low and High Liberalisation scenarios. These estimates represent sizeable falls in profitability. Here, the influence of Brexit is of significance, particularly in terms of prices (as alluded to in Table 8-1 above).

Of course, for the purpose of this analysis, the number of livestock on-farm has been kept constant. If the output declines projected in Chapter 6 were also factored in, the profitability of LFA cattle and sheep farms would be eroded further.

When the impacts on other agricultural enterprises and fixed costs are considered, the agricultural production margin experiences further declines of approximately 11% to 12%. This means that LFA cattle and sheep farms would make average losses in excess of £40,000 under each scenario.

Once again, support payments are pivotal to these farms generating business surpluses. However, the average agricultural business surplus is projected to decline by 16.7% in the Main Baseline. The declines are more pronounced in the FTA scenarios, ranging from 17.7% to over 18%.

These projections suggest that there will not be much scope for reinvestment in cattle and sheep enterprises for the long-term. This will limit the sector's attractiveness to young farmers and new entrants. As highlighted in the industry interviews, this presents serious challenges for the future viability of many cattle and sheep farms in Scotland.

Table 8-4: Projected Impact of FTA Scenarios on LFA Scottish Beef & Sheep Farms (£/Farm)

Parameter	19/20 (Base)	Main Baseline (Brexit)	% Ch. vs Base	FTAs (Low Lib)	% Ch. vs Base	FTAs (High Lib)	% Ch. vs Base
Livestock Output (excluding support)	74,930	72,082	-3.8%	71,791	-4.2%	71,622	-4.4%
Livestock-Specific Variable Costs	38,281	38,285	0.0%	38,263	0.0%	38,241	-0.1%
Livestock-Specific Gross Margin	36,648	33,798	-7.8%	33,528	-8.5%	33,381	-8.9%
Total Agricultural Output	82,298	79,380	-3.5%	79,079	-3.9%	78,906	-4.1%
Total Agricultural Variable Costs	48,238	48,748	1.1%	48,684	0.9%	48,616	0.8%
Total Agricultural Fixed Costs	70,632	71,134	0.7%	71,139	0.7%	71,145	0.7%
Total Agricultural Costs	118,870	119,881	0.9%	119,823	0.8%	119,761	0.7%
Margin from Agricultural Production	-36,572	-40,502	-10.7%	-40,744	-11.4%	-40,855	-11.7%
Agricultural Support	60,107	60,107	0.0%	60,107	0.0%	60,107	0.0%
Agricultural Business Surplus	23,536	19,606	-16.7%	19,363	-17.7%	19,252	-18.2%

Source: Scottish Farm Business Survey (2019/20)

Lowland Cattle and Sheep Farms

Similar to the analysis for LFA cattle and sheep, Table 8-5 summarises the results of the long-term Main Baseline and the impact of the Low and High Liberalisation FTA scenarios on Scottish lowland cattle and sheep farms. Again, agricultural enterprises are the focus with contracting and diversification activities have been removed from the analysis.

The assumptions underpinning the projected percentage changes under all scenarios are the same as those presented previously for LFA farms. However, due to differences in enterprise mix and utilisation of resources, some differences emerge. On lowland farms, cattle production accounts for 61% of agricultural output. Sheep and wool has a relatively low (19%) share. Of the other enterprises, barley (9%) is the most prominent.

Given these differences in enterprise mix, specifically the smaller share of sheep, it is unsurprising that whilst all scenarios show declines in enterprise output, ranging from 4% to 4.3%, they are less pronounced than for LFA farms. Again, most of these declines are projected in the Main Baseline, with Brexit being of significance, but not the only influence.

Livestock-specific variable costs show small long-term decreases. This is chiefly driven by reduced animal feed costs (-1.5% to -1.7%) with these decreases again being partially offset by increased veterinary and medical costs.

The resultant livestock-specific gross margin declines by 7.6% in the Main Baseline with the impact being somewhat more pronounced in the FTA scenarios (-7.9% to -8.2%).

Similar to LFA farms, lowland cattle and sheep farms also makes a loss from agricultural production, estimated at nearly £24,900 in 2019/20. Given the impact on livestock gross margins, losses from agricultural production are projected to surpass £30,000 in the long-term under both the Main Baseline and FTA scenarios.

Concerningly, for these farms, the support payments (nearly £35,500) just about cover these projected long-term losses. The agricultural business surplus for lowland farms is forecast to at least halve in the future. Again, the viability of many lowland grazing livestock farms will be called into question, particularly if FTAs are also agreed with other major livestock producing countries, such as the US.

Table 8-5: Projected Impact of FTA Scenarios on Lowland Scottish Beef & Sheep Farms (£/Farm)

Parameter	19/20 (Base)	Main Baseline (Brexit)	% Ch. vs Base	FTAs (Low Lib)	% Ch. vs Base	FTAs (High Lib)	% Ch. vs Base
Livestock Output (excluding support)	106,302	102,098	-4.0%	101,937	-4.1%	101,725	-4.3%
Livestock-Specific Variable Costs	55,486	55,150	-0.6%	55,110	-0.7%	55,069	-0.8%
Livestock-Specific Gross Margin	50,816	46,948	-7.6%	46,827	-7.9%	46,656	-8.2%
Total Agricultural Output	131,240	126,605	-3.5%	126,384	-3.7%	126,145	-3.9%
Total Agricultural Variable Costs	76,034	76,759	1.0%	76,649	0.8%	76,529	0.7%
Total Agricultural Fixed Costs	80,078	80,514	0.5%	80,519	0.6%	80,524	0.6%
Total Agricultural Costs	156,112	157,274	0.7%	157,168	0.7%	157,053	0.6%
Margin from Agricultural Production	-24,872	-30,668	-23.3%	-30,783	-23.8%	-30,908	-24.3%
Agricultural Support	35,440	35,440	0.0%	35,440	0.0%	35,440	0.0%
Agricultural Business Surplus	10,568	4,771	-54.9%	4,656	-55.9%	4,532	-57.1%

Source: Scottish Farm Business Survey (2019/20)

8.4.4 Potatoes

The MAGNET modelling did not cover potatoes. Given the importance of seed potatoes in Scotland, Table 8-6 shows the projected impact of Brexit (reflected in the Main Baseline) and the FTA scenarios on a Scottish seed potatoes enterprise. In contrast to the MAGNET modelling results above, it has not been possible to model other long-term structural changes in the potatoes' sector that might arise due to population growth, GDP, cost competitiveness etc. Accordingly, changes in the Main Baseline versus the Base Year, summarised in Table 8-6, are chiefly to do with Brexit.

The farm-level data shown in Table 8-6 are primarily based on the Scottish Farm Management Handbook (2019/20)[28] for a high-performing seed potatoes' enterprise. Casual labour costs from the ABC Book (90th Edition)[29] are used as these are not reported in the Farm Management Handbook.

The analysis combines insights from previous studies which Andersons and WUR have been involved in as well as input from this study's primary research (see section 7.1.6) and the generic input cost data projected by MAGNET. The analysis focuses on assessing impact of each scenario on output, variable costs and gross margins, when casual labour is factored into consideration.

Based on primary research and desk-based input, it is estimated that seed potato prices are approximately 4% lower than they otherwise would have been had Brexit not occurred. This is driven by the loss of export sales to the EU27 market and NI (which is in the EU Single Market for goods). Together, these markets account for around 8% of Scottish seed potatoes' production (see Table 4-4). The percentage fall in seed potatoes prices is estimated at around half of this share. Primary research input suggests that the impact on ware potatoes' prices have been relatively minimal, especially for Scotland.

As a result, output from Scottish seed potato farms is estimated to decline by 3.9% in the Main Baseline. Similar declines are projected in the FTA scenarios. Whilst interviewees acknowledge that some increased sales of seed potatoes to the GCC market could take place as a result of an FTA, it represents a small share of export sales, so any impacts on price would be minimal.

Using the input cost assumptions generated in each scenario by the MAGNET modelling, variable costs are forecast to rise by 1.4% in the Main Baseline. Whilst fertiliser prices are projected to increase by 8.1%, this is largely offset by the 4.1% decline in seed prices, as explained above. Crop protection costs are forecast to increase by 1.1% and casual labour costs by 15%. However, casual labour costs account for a relatively small proportion (14%) of the selected variable costs in the Main Baseline. For each of the FTA liberalisation scenarios, variable costs are projected to remain essentially the same.

Taking account of these changes, the gross margin on Scottish seed potato farms is projected to decline by around 64% to 65% in the future. There is relatively little difference in performance between the Main Baseline and the FTA scenarios, with casual labour costs rising slightly further under the FTAs based on MAGNET modelling projections for crop-related labour costs (see Table 9-1). The new non-EU FTAs are not expected to have a significant impact on the Scottish seed potatoes' sector. It is clear that restoring access to EU and Northern Irish markets is the key to safeguarding the long-term profitability of the Scottish seed potatoes sector.

Table 8-6: Projected Brexit Impact Analysis - Scottish Seed Potatoes- High Performing (£ / Ha)

Parameter	19/20 (Base)	Main Baseline (Brexit)		FTAs (Low Lib)		FTAs (High Lib)	
	£/Ha	£/Ha	% Ch.	£/Ha	% Ch.	£/Ha	% Ch.
Seed (25t/ha; £220/t)	6,650	6,379	-4.1%	6,382	-4.0%	6,385	-4.0%
Ware (6t/ha; £45/t	270	270	-0.1%	270	0.0%	270	0.0%
Stockfeed (2t/ha; £20/t)	40	40	0.0%	40	0.0%	40	0.0%
Output	6,960	6,689	-3.9%	6,692	-3.9%	6,695	-3.8%
Total Variable Costs①	**6,410**	**6,495**	**1.3%**	**6,497**	**1.4%**	**6,502**	**1.4%**
Gross Margin	**551**	**194**	**-64.7%**	**194**	**-64.7%**	**192**	**-65.0%**

Sources: Farm Management Handbook (2019/20), Agricultural Budgeting and Costing Book, Andersons

① Variable costs are primarily based on Scottish Farm Management Handbook, but as these do not include casual labour, costings from the Agricultural Budgeting Costing Book (90th edition) have been used to provide indication of Brexit impact.

8.5 Concluding Remarks

The analysis presented in this Chapter shows that the introduction of new FTAs with non-EU partners will generally have limited impacts on Scottish farm-level performance in the long-term. Instead, and as illustrated in sections 8.3 and 8.4, it is the projected changes expected to occur in the Main Baseline scenario, which are mostly due to non-Brexit factors, that will contribute most to the declines in farm business income. That said, it remains crucial for Scottish farm sectors to continue to have good market access to the EU and that the recently lost access for seed potatoes is restored.

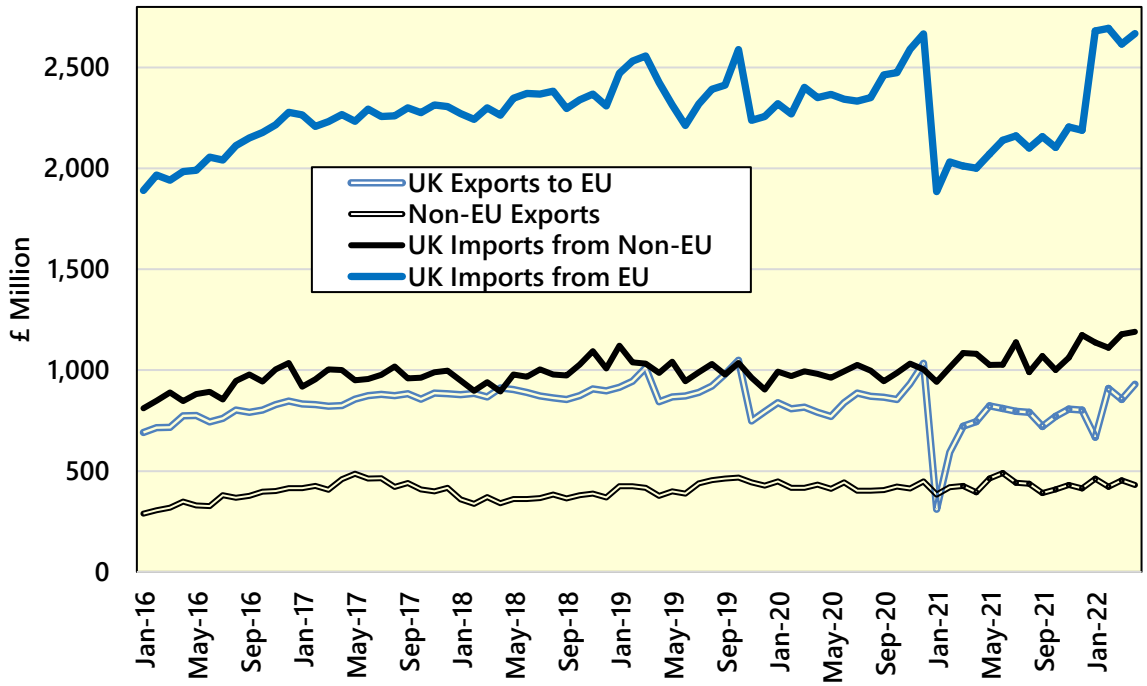
It is also clear that without continued support and, if long-term price trends continue, many farm businesses will experience severe financial pressure, particularly on cattle and sheep farms. This will have significant implications for the future viability and structure of the industry as well as for the Scottish rural economy more generally.

9. Key Conclusions and Final Remarks

This study shows that the potential impacts of future non-EU FTAs on Scottish farming are complex and require a nuanced analysis, particularly with Brexit having already taken place.

Whilst the UK-EU TCA provides for tariff-free and quota-free trade between the UK and the EU27, as Figure 9-1 shows, the imposition of NTMs had a substantial impact on trade between both parties during 2021. Whilst trade with the EU has recovered strongly since, it is also evident that UK trade with non-EU partners, specifically imports is also increasing. As results from this study show, the reorientation of trade towards non-EU countries will become more pronounced as the UK agrees trade-deals with non-EU countries. With this in mind, the study's key conclusions are set-out below.

Figure 9-1: UK Food and Live Animals' Trade with EU and Non-EU Partners – Jan '16 to May '22



Source: ONS

9.1 Key Conclusions

1. **Impact of selected FTAs is generally limited, but significant in some sectors:** similar to other studies looking at the impact of FTAs with non-EU partners on UK agri-food, the long-term impact of the trade deals assessed in this study is generally relatively limited. Even though MAGNET CGE model would predict in some cases more substantial increase in trade volumes, projected impacts on

value added are less pronounced. The complementary qualitative analysis (Primary Research) also presents a similar perspective. That said, the impact on Scottish sheepmeat output is forecast to be significant and is of concern to industry participants. Beef and wheat output are also negatively affected, but to a lesser extent.

2. **Non-EU FTAs lead to contrasting projections for wheat and barley:** at the UK level, the new FTAs are projected to bring about a GVA decline of wheat by 2.7% to 5.9% under Low and High Liberalisation scenarios respectively vis-à-vis the Main Baseline. However, barley GVA is forecast to rise slightly by 0.2% to 0.3%. That said, there is the potential for a higher GVA to be achieved for the Scottish economy, via increased whisky exports to overseas markets as a result of new FTAs.
3. **Biggest FTA opportunities for the dairy sector:** of the commodities assessed, the dairy sector is best positioned to see export growth. Here, the GCC market is viewed as offering notable growth potential. Whilst opportunities also exist to export to Canada, as this market is highly protectionist, such opportunities are likely to be limited to selected niches (e.g. high-end cheeses).
4. **Scottish sheepmeat is going to come under the most pressure:** arising from the non-EU FTAs. Whilst NZ has only been partially fulfilling its TRQ in recent years, the introduction of the new FTA is seen by many industry participants as a strong signal for NZ businesses to recapture trade with the UK, which was lost when the UK joined the EEC. Given the provisions of the UK-NZ FTA, it is likely that in the coming years, the increased imports from NZ will be catered for via the pre-existing WTO TRQ. However, if geopolitics changes the trading relationships between Australia, NZ and China, it is likely that additional volumes of antipodean sheepmeat will be exported to the UK.
5. **Beef sector will come under notable pressure but some opportunities also exist:** whilst imports from Australia and NZ will exert significant pressure, a trade deal with Canada is likely to generate some export opportunities. Given the brand recognition of Scotch beef, it should be relatively well-positioned to exploit such niches. That said, safeguarding domestic sales, particularly to UK retailers, from overseas competitors will remain most crucial.
6. **Cumulative impacts of future FTAs will be more significant:** although the aggregated impact of the selected FTAs is relatively limited, the cumulative effect of multiple trade deals over the longer term should not be underestimated. This is especially so if the UK agrees FTAs with agricultural powerhouses such as the US and Mercosur (including Brazil and Argentina).

7. **The FTAs with Australia and NZ set important precedents:** the recently agreed FTAs with Australia and NZ give important signals to trade negotiators elsewhere as to what the UK is willing to cede in trade negotiations. Therefore, the standards that the UK is willing to accept for imports is pivotal, especially as other FTA partners will likely push for more concessions during negotiations. Any significant changes to standards relating to food safety and hygiene, the environment and animal welfare will have major implications for Scottish produce. This is not just on the home market, but overseas as well, especially in terms of highly-renowned brands such as Scotch Beef.
8. **Impact of selected FTAs on wages is projected to be minimal:** similar to other studies looking at the impact of FTAs with Australia and NZ on the wider economy, the MAGNET modelling results suggest that the impact of the selected FTAs on wages within the selected agri-food sectors is projected to be minimal versus the Main Baseline (see Table 9-1). Even in the High Liberalisation scenario, wages are projected to be just 0.8% higher for cereals and 0.2% higher for dairy and red meat. Of more significance, was the ending of Free Movement in January 2021, which contributed to significant increases in labour costs and the ability of the agri-food industry to access the labour supply that it needs. Within the sectors selected, this impact is most apparent in meat processing; however, it is in the horticulture sector (not within scope) where the challenges are most pronounced.
9. **Effects of FTAs on employment will be closely aligned to GVA impacts by sector:** Table 9-1 also shows that employment in the sheepmeat sector will be most negatively affected by the selected FTAs with declines of around 10.5% to just over 11% projected. Notable declines are also forecast for wheat and beef and are estimated at 3% and 6% for the Low and High Liberalisation scenarios respectively. Conversely, dairy sector employment could increase by 9% in the High Liberalisation scenario. Whilst the results suggest that there would be minimal change to employment linked with barley processing, there is evidence that increased demand for Scotch whisky is driving increased employment by Scottish maltsters. In turn, if the new FTAs drive significant increases in whisky exports, then it is likely that long-term employment in barley malting operations will be higher than the results in Table 9-1 suggest.

Table 9-1: Long-Term Impacts of FTAs on Wages & Employment (% Change vs Main Baseline)

	Impact on Wages		Impact on Employment	
Sector	**FTA Low Liberalisation**	**FTA High Liberalisation**	**FTA Low Liberalisation**	**FTA High Liberalisation**
Wheat	0.3%	0.8%	-2.9%	-6.3%
Barley	0.3%	0.8%	0.2%	0.1%
Dairy	0.1%	0.2%	3.0%	9.0%
Beef	0.1%	0.2%	-2.8%	-6.1%
Sheepmeat	0.1%	0.2%	-10.5%	-11.1%

Sources: Wageningen University and Research (WUR) and Andersons

10. **Long-term impact of Brexit is also deemed to be limited:** this study shows relatively small differences in output under the Main Baseline (incorporating Brexit) and the Alternative Baseline (No-Brexit scenario). That said, the loss of the EU and NI markets for Scottish seed potato exports is significant and the restoration of this market access is a key goal for the sector. It should also be a primary objective for policy-makers.
11. **Short-term impacts of Brexit are more pronounced on UK exports to the EU:** in comparison with imports in the opposite direction. This is because the UK Border Operating Model for controlling imports will not become fully functional until the end of 2023. Conversely, UK exports to the EU have been subject to border controls and checks since January 2021. Furthermore, the impact of regulatory controls on UK-EU trade has had a more substantial impact on small and micro enterprises. In numerous cases, these businesses have ceased trading with the EU. Therefore, whilst overall trade might not be that affected, this trade is now in the hands of larger traders to a much greater extent.
12. **Whilst Covid-19 had substantial impacts during 2020 and 2021, the long-term effects are deemed to be limited:** undoubtedly, the Covid-19 pandemic has had a major impact on the global economy, particularly during 2020 and 2021. However, despite this, its effect on agri-food was relatively limited[30]. The biggest effects on agri-food were in terms of labour availability and costs as well as the associated supply-chain and logistical challenges. Whilst this was a key factor in the sizeable wage increases for logistics staff and HGV drivers and has contributed to increased global inflation, by the time that the industry interviews were being undertaken in this study, the focus has started to shift away from the pandemic. Although labour costs and supply-chain issues which have arisen from Covid-19 are anticipated to linger for a few months yet, they are not expected to have a major long-term impact. Indeed, most industry participants believe that

the Russia-Ukraine conflict will have a more telling impact on the future performance of the global agri-food industry.

13. **Land-use change pressures will also be highly influential:** industry feedback suggests that whilst trade-related pressures will be significant for grazing livestock, other long-term pressures will also feature prominently. In particular, the pressure (incentive) for land-use change arising from poor profitability in grazing livestock as well as societal needs to offset greenhouse gas emissions will heavily influence the future size and structure of the industry. This is especially so in Scotland where tree-planting has already led to declines in sheep populations. This trend is expected to continue.
14. **Scottish agricultural produce is highly valued internationally and its reputation needs to be leveraged further:** industry interviewees highlight the importance of exploiting the brand reputation of Scotch beef, whisky and salmon in overseas markets. This strong reputation needs to be leveraged into other sectors, particularly lamb and dairy products.

9.2 Final Remarks

Overall, it is evident that the UK and Scottish farming industries have entered a "Decade of Disruption". Aside from the new FTAs, the industry is grappling with multiple challenges arising from inflation, policy reform, structural challenges, labour shortages, and GHG emissions. Whilst the onus is ultimately on the Scottish food and farming industries to adapt to such pressures, it is incumbent on policy-makers to support where possible. This is especially the case in terms of managing the transition that is ahead.

By getting the balance right, policy-makers can support Scottish food and farming in becoming a more market oriented, competitive and sustainable industry in the long-term. Environmental concerns have become a central consumer issue both domestically and overseas. There should be a focus on creating a compelling value proposition for Scottish agri-food produce that is high-quality and "Eco-friendly". Indeed, the development of an "Eco" brand that encapsulates the high-quality, integrity and sustainability of Scottish produce should be pursued further. This would help to safeguard the position of Scottish produce domestically and serve as a flagship to capture overseas sales.

This will require collaboration, not just within a UK context, but with likeminded overseas partners as well. Globally, the agricultural sector has more to gain by working together to address and overcome major societal challenges (e.g. climate change, biodiversity crisis, feeding a planet of 9-10 billion people).

Change has always been a feature of farming and the industry has come through multiple crises in the past. The Covid-19 pandemic, Brexit and the Russia-Ukraine war have created new challenges. But, these crises have also shown the importance of robust, secure and high-integrity supply-chains. Given the strong international reputation of Scottish food and drink, whilst the new FTAs will bring challenges, there are also opportunities, provided that there is a level playing field for all.

Acronyms and Abbreviations

ABC	Agricultural Budgeting and Costing (Book)
AEO	Authorised Economic Operator (a quality mark that shows your role in the international supply chain is secure and your customs controls and procedures are efficient and meet EU standards)
AFBI	Agri-Food and Biosciences Institute
AHDB	Agriculture and Horticulture Development Board
APHA	Animal and Plant Health Agency
ASF	African Swine Fever
AU	Australia
AUKUS	Refers to a tri-lateral security pact between Australia, the UK and the US.
AVE	Ad-Valorem Equivalent
BCP	Border Control Post (Previously called Border Inspection Post (BIP))
CA	Canada
CAP	Common Agricultural Policy (of the EU)
CET	Common External Tariff
CETA	Canadian, European Trade Agreement
CGE	Computational General Equilibrium
CPTPP	Comprehensive and Progressive Trans-Pacific Partnership
CUSMA	Canada-US-Mexico Agreement (also called USMCA)
CVED	Common Veterinarian Entrance Document
CWE	Carcase Weight Equivalent
DEFRA	Department of Environment, Food and Rural Affairs
DPE	Designated Port of Entry
ECB	European Central Bank
EEA	European Economic Area
EEC	European Economic Community
EHC	Export Health Certificate
EU	European Union
EORI	European Operator Registration and Identification Scheme (an EORI number is required to trade goods with countries outside the EU)
ERSA	Economic Report on Scottish Agriculture
ESRC	Economic and Social Research Council
FAO	Food and Agriculture Organisation of the United Nations (UN)
FAPRI	Food and Agricultural Policy Research Institute (economic model)
FBI	Farm Business Income
FTA	Free Trade Agreement

GCC	Gulf Cooperation Council
GB	Great Britain
GDP	Gross Domestic Product
GVA	Gross Value Added
HMRC	Her Majesty's Revenue and Customs – government department
HS	Harmonised System
HTS	Harmonized Tariff Schedule (used by the US)
IFAD	International Fund for Agricultural Development
IPAFFS	Import of Products, Animals, Food and Feed System
JIT	Just-in-Time
JRC	Joint Research Committee
Kt	Thousand tonnes
LFA	Less Favoured Area
LoLo	Lift-on, Lift-off
MAGNET	Modular Applied General Equilibrium Tool
MFN	Most Favoured Nation
MRA	Mutual Recognition Agreement
NI	Northern Ireland
NCH	National Clearance Hub
NFUS	National Farmers' Union, Scotland
NTB	Non-Tariff Barrier
NTM	Non-Tariff Measure
NZ	New Zealand
OECD	Organisation for Economic Cooperation and Development
POAO	Products of Animal Origin
QMS	Quality Meat Scotland
RCEP	Regional Comprehensive Economic Partnership
RESAS	Rural and Environment Science and Analytical Services Division
ROI	Republic of Ireland
RoO	Rules of Origin
RoRo	Roll-on, Roll-off
RoW	Rest of World
SASA	Science and Advice for Scottish Agriculture
SAWS	Seasonal Agricultural Workers' Scheme
SPS	Sanitary and Phytosanitary (Measures)
TCA	Trade and Cooperation Agreement
TBT	Technical Barriers to Trade
TIFF	Total Income from Farming

ToR	Terms of Reference
TRQ	Tariff Rate Quota
UAE	United Arab Emirates
UK	United Kingdom
UKGT	UK Global Tariff
UNCTAD	United Nations Conference on Trade and Development
UN FAO	Food and Agriculture Organisation of the United Nations (UN)
US	United States (of America)
USDA	United States Department of Agriculture
USITC	United States International Trade Commission
USMCA	United States-Mexico-Canada Agreement (also called CUSMA)
UTL	Unilateral Trade Liberalisation
WTO	World Trade Organisation
WUR	Wageningen University and Research

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