Impact of HM Treasury/Defra's Vision for the Common Agricultural Policy on Agriculture in Scotland

FAPRI-UK Project

July 2009

Joan Moss, Myles Patton, Lichun Zhang and In Seck Kim

(Queen's University Belfast & Agri-Food & Biosciences Institute)

Julian Binfield and Patrick Westhoff

(FAPRI, University of Missouri)

Queen's University Belfast

Food and Agricultural Policy Research Institute
FAPRI
College of Agriculture, Food and Natural Resources

afbi Agri-Food and Biosciences Institute

Executive Summary

The impact of the key policy reforms underlying the UK government's long-term vision for the Common Agricultural Policy on agriculture in Scotland is examined using the FAPRI-UK project modelling system.

Five policy scenarios are analysed:

Scenario 1: Implementation of Health Check reforms
Scenario 2: Doha Round WTO reforms in addition to Scenario 1
Scenario 3: Full decoupling across the EU in addition to Scenario 2
Scenario 4: Further trade liberalisation in addition to Scenario 3
Scenario 5: Phasing out the Single Farm Payment in addition to Scenario 4

Scenarios 1 to 3 address policy changes that are likely to occur prior to consideration of the implementation of policy changes under Vision. Scenarios 4 and 5 incorporate reforms related to the 'Vision' proposals. Under Scenario 4 ('Further trade liberalisation'), import tariffs for all agricultural sectors are reduced in line with other sectors of the economy (assumed to be 4 per cent). Scenario 5 incorporates the phased elimination of the Single Farm Payment (SFP) in conjunction with further trade liberalisation.

The key findings are summarised below sector by sector (see Appendix 2 for summary result tables):

Dairy Sector

- The phased increase and eventual abolition of milk quotas under the Health Check reforms has a depressing impact on the projected Scottish producer milk price and production.
- Cheese and, to a greater extent, butter prices decline further in response to Doha WTO reforms (butter and cheese are designated sensitive products). The decline in the prices of these commodities exerts a further downward impact on the Scottish producer milk price.
- Further trade liberalisation has a small negative impact on dairy commodity prices since butter SMP and WMP EU prices track their world prices. As a consequence, the knock-on impact on the Scottish producer milk price and production is limited.
- The phased elimination of the SFP has a negligible impact on the Scottish dairy sector.

Beef Sector

- Implementation of the Health Check reforms has an insignificant impact on the Scottish beef sector.
- Under the WTO reform scenario, it is assumed beef is designated a sensitive product. The tariff rate quota (TRQ) expansion has a depressing impact on beef prices. The projected Scottish price of finished beef animals is 8 per cent lower under Scenario 2 compared to the Baseline in 2018. The lower beef price leads to a reduction in Scottish suckler cows and production.
- Full decoupling across the EU has little impact on beef prices and production in Scotland.
- The extensive over-quota tariff cuts results under Scenario 4 in a significant increase in projected non-EU beef imports. It is projected that EU beef prices,

including Scotland, decline markedly in response to this large increase in imports. By the end of the projection period, the Scottish price of finished beef animals is 26 per cent lower under Scenario 4 compared to the Baseline. This negative price impact is considerable compared to Scenario 2 and highlights the importance of the 'Sensitive Status' for beef.
- The phased elimination of the SFP has a significant negative impact on suckler cow numbers and beef production in Scotland.

Sheep Sector
- Projected Scottish sheepmeat prices and production are not significantly affected by the Health Check reforms.
- The full reduction in over-quota import tariffs under the WTO reform scenario leads to higher non-EU imports and consequently, lower sheepmeat prices. The projected Scottish clean sheep price is 6 per cent lower in 2018 under Scenario 2, compared to the Baseline. Projected Scottish ewe numbers and sheepmeat production fall in response to the decline in price.
- Full decoupling across the EU has a small downward impact on EU-27 sheepmeat production, with a corresponding increase in EU sheepmeat prices. In line with the rest of the EU, Scottish sheepmeat prices are slightly higher. Given that the ewe premium was fully decoupled in Scotland under the 2003 CAP reforms, it is projected that there is a small increase in sheepmeat production in response to price under the full decoupling scenario.
- It is projected that further trade liberalisation leads to a substantial increase in non-EU sheepmeat imports. The increase in non-EU imports has a depressing impact on sheepmeat prices. The projected Scottish clean sheep price is 12 per cent lower in 2018 under Scenario 4, compared to the Baseline. The decline in price reduces sheepmeat economic returns and depresses Scottish ewe numbers and production.
- Phasing out the SFP on top of further trade liberalisation has a signifcant negative impact on Scottish sheepmeat production but a small upward impact on price due to lower production at the overall EU-27 level.

Pig Sector
- Implementation of the Health Check reforms has a negligible impact on the Scottish pig sector.
- Under the WTO reform scenario, it is assumed pigmeat is designated a sensitive product. The TRQ expansion leads to a substantial increase in non-EU pigmeat imports. As a result, projected Scottish pigmeat prices are 5 per cent lower in 2018 under Scenario 2, compared to the Baseline. It is projected that there is a corresponding fall in Scottish pigmeat production.
- Further trade liberalisation exerts a slight downward impact on Scottish pigmeat prices and production.
- Phasing out of the SFP on top of further trade liberalisation has a negligible impact on the Scottish pig sector.

Poultry Sector
- It is projected that the Scottish poultry price and production are not significantly affected by the Health check reforms.
- Under the WTO reform scenario, it is assumed poultry is designated a sensitive product. The expansion in TRQ and elimination of export subsidies have a

depressing impact on the Scottish poultry price. The Scottish production impact is, however, limited.

- Further trade liberalisation has a further negative impact on the Scottish poultry price.
- The phased elimination of the SFP has a projected negligible impact on the Scottish poultry sector since this form of support is not associated with this sector.

Crop Sector

- The incorporation of the Arable Aid Payment within the SFP within remaining Member States under Scenario 1 has a negligible impact on the Scottish crop sector.
- It is projected that the cuts in import tariffs under the Doha WTO reform scenario and the further trade liberalisation scenario have a marginal impact on Scottish crop prices since EU crop prices closely track their world prices. It is projected, however, that Scottish barley production declines slightly in response to the lower projected livestock numbers.
- The phased elimination of the SFP has a further negative impact on Scottish barley production.

Impact of HM Treasury/Defra's Vision for the Common Agricultural Policy on Agriculture in Scotland

1. Introduction

The paper "A Vision for the Common Agricultural Policy", issued jointly by HM Treasury and Defra in December 2005 (HM Treasury and Defra, 2005), sets out the UK government's vision for EU agricultural policy for the next 10 to 15 years. The document outlines proposed radical reforms, with the stated aim to build an industry which is sustainable and an integral part of the European economy. It is proposed that agriculture should be:

- internationally competitive without reliance on subsidy or protection;
- rewarded by the market for its outputs and by the taxpayer only for producing societal benefits that the market cannot deliver;
- environmentally-sensitive, maintaining and enhancing landscape and wildlife and tackling pollution;
- socially responsive to the needs of rural communities;
- producing to high levels of animal health and welfare; and
- non-distorting of international trade and the world economy.

Key proposed policy reforms designed to achieve this vision of sustainability include the alignment of import tariffs for all agricultural sectors with other sectors of the economy and the abolishment of production subsidies, price and direct income support measures and export subsidies.

This report considers the likely impact of changes in policy related to 'Vision' on the key agricultural sectors in Scotland using the FAPRI-UK project modelling system. The FAPRI-UK modelling system is the product of a collaborative research venture between the Queen's University Belfast, the Northern Ireland Agri-Food and Biosciences Institute (AFBI) and the Food and Agricultural Policy Research Institute (FAPRI), University of Missouri. The models consist of a set of econometric equations of the beef, sheep, dairy, pig, poultry, cereal and oilseed sectors of England, Wales, Scotland and Northern Ireland (NI). The UK models are operated in conjunction with the FAPRI European Union model (GOLD) run by the University of Missouri which is in turn linked to the FAPRI Global modelling system.

Five policy scenarios are analysed. In order to isolate the impact of policy reforms under 'Vision', it is necessary to first of all account for policy changes that are likely to occur prior to consideration of the implementation of these more radical reforms. In the immediate future, it is likely that the agreement reached by the Agriculture Council on the Common Agricultural Policy (CAP) Health Check in November 2008 will be ratified later in the year. In addition, Doha round World Trade Organisation (WTO) negotiations are ongoing and although the process has been protracted, a great deal of consensus has been reached on many of the key issues on agricultural trade. Finally, full decoupling across the EU may feature in the post-2013 EU budget review talks. These policy reforms are analysed sequentially, on an additive basis, under Scenarios 1 to 3. The subsequent scenarios incorporate reforms related to the 'Vision' proposals. Under Scenario 4 ('Further trade liberalisation'), import tariffs for all agricultural sectors are reduced in line with other sectors of the economy (assumed to be 4 per cent). Finally, Scenario 5 incorporates the phased elimination of the Single Farm Payment (SFP) in conjunction with further trade liberalisation. In summary, the five scenarios are as follows:

Scenario 1: Implementation of Health Check reforms
Scenario 2: Doha Round WTO reforms in addition to Scenario 1
Scenario 3: Full decoupling across the EU in addition to Scenario 2
Scenario 4: Further trade liberalisation in addition to Scenario 3
Scenario 5: Phasing out the Single Farm Payment in addition to Scenario 4

The report is organised as follows. The methodology underlying the analyses is described in Section 2. This is followed by a description of the assumptions underlying the Baseline in Section 3. The scenarios are defined in Section 4, while the impacts of the scenarios on the key agriculture sectors in Scotland are analysed in Section 5. Some conclusions are drawn in Section 6.

2. Methodology

The FAPRI-UK modelling system captures the dynamic interrelationships among the variables affecting supply and demand in the main agricultural sectors of England, Wales, Scotland and Northern Ireland (NI). The model consists of a system of equations covering the dairy, beef, sheep, pigs, poultry, wheat, barley, oats and rapeseed sectors. The UK model is fully incorporated within FAPRI's EU model (GOLD) and consequently solves simultaneously with models for the rest of the EU and a rest of the world model. It thereby yields UK projections which are consistent with equilibrium in the EU and the rest of the world.

The modelling system is simulated under the assumptions that current policies remain in place, specific macroeconomic projections hold and average weather conditions apply. Baseline projections of key variables for each country in the UK are generated for a ten year period. Baseline projections provide a benchmark against which projections derived from policy scenarios can be compared and interpreted. The modelling system is then further simulated with changes to policy variables – in this case variables related to the CAP and EU agricultural trade policy - and the results are compared against the November 2008 Baseline to isolate the policy effects.

3. Baseline Assumptions

The Baseline assumes that policies that were in operation in November 2008 remain in place for the duration of the projection period (2009 to 2018). Specifically, the Baseline incorporates features of the Luxembourg CAP reforms, including the replacement of coupled direct payments with the decoupled Single Farm Payment (SFP) within the EU. The degree of decoupling varies amongst the different member states. In practice most of the arable area aid payment has been incorporated in the SFP, but a significant number of countries opted to keep beef payments coupled. These have been retained as coupled in the model.

In Scotland, all coupled direct payments were incorporated within the SFP, and thereby decoupled from production, under the Luxembourg CAP reforms. Despite this, a small proportion of the SFP in Scotland was redirected on a headage basis to beef calves under the National Envelope mechanisim. Although the SFP is decoupled from production in an administrative sense, it is assumed that this payment exerts a partial influence on production. There are a number of reasons

why the SFP should have a production stimulating impact. Cross compliance criteria require farmers to "maintain land in good agricultural condition", which implicitly assumes that at least some production will continue. Moreover, economic theory indicates that decoupled payments influence the production decision since increased wealth allows producers to undertake more risk (Hennessey, 1998). In addition, the provision of guaranteed direct payments may enable producers to expand production since they are more likely to be able to access credit.

Although the SFP was fully decoupled across the UK in 2005 little empirical/research evidence exists concerning the precise impact of this payment. Studies by Renwick and Revoredo (2008) and Howley et al. (2009) support the arguement that producers are using the SFP to cross-subsidise production in England and Ireland respectively. However, both agree that it is too early to determine the precise long term impact as there is a time lag associated with changing production levels and it will take time for producers to break the link between the payment and production due to the fundamental nature of the policy change. In the US, decoupled payments were introduced in 1996 under the Federal Agriculture Improvement and Reform (FAIR) Act. Research evidence shows that in this case the production response is attributable to 30 per cent of the decoupled direct payment (Adams *et al.*, 2001). Based on this evidence a 30 per cent production stimulating impact is incorporated within the FAPRI-EU and FAPRI-UK beef, sheep and crop models. In the dairy sector, producers never received coupled direct payments and thus there was no existing production response in place when the SFP was introduced. Consequently, it is assumed that the production stimulating impact of the SFP in the dairy sector is less than in the other sectors. Specifically, it is assumed that the SFP has a milk production stimulating effect of 10 per cent[1].

Compulsory EU Modulation is applied to all direct payments, including the SFP. In addition to the compulsory EU modulation, additional voluntary modulation is applied in each country in the UK at different rates.

The Baseline incorporates the 2 per cent milk quota rise for the start of the 2008/09 quota year. It is assumed that the dairy quota system remains in place for the whole of the projection period. However, milk production is modelled in such a way that if movements in prices and or costs result in the elimination of quota rent then production can fall below quota.

The set-aside derogation agreed for 2008 is incorporated in the Baseline, with resulting increases in crop areas. It is assumed that this derogation remains in place for the remainder of the projection period since it is unlikely that the Commission would curtail EU crop production under strong global demand conditions.

It is assumed that the EU export subsidy limits and import tariffs, agreed under the Uruguay Round Agreements Act (URAA), remain in place.

The macroeconomic assumptions used within the Baseline are those that were provided by Global Insight in November 2008. It is assumed that the average EU-27 GDP growth is -0.4 per cent in 2009, but recovers slightly in 2010 and remains at

[1] Note, the analysis is also undertaken with a 30 per cent production stimulating impact assumption for the dairy sector to determine the impact of this assumption (see footnote 4).

around 2 per cent from 2011 onwards. Similarly, in the UK GDP growth is negative in 2009 (-1.5 per cent), but rises in 2010 and remains at 2.4 per cent in latter part of the projection period. Furthermore, within the November 2008 Global Insight assumptions the euro remains strong against the dollar at around 0.7 Euro/dollar (1.4 dollar/euro). It is also assumed that the UK pound weakens against the euro in 2009 (0.79 UK pound/euro in 2008, 0.83 in 2009) but strengthens slightly in the longer term (0.73 UK pound/euro).

Due to concerns about the worsening economic situation, the Baseline and Scenario 5 were re-estimated using January 2009 Global Insight projections for the EU, which are more pessimistic in the near term (e.g. the average EU-27 2009 GDP growth is –1.7 per cent in 2009) but are similar to the November 2008 projections in the latter part of the projection period. Given the convergence in the macro-economic projections in the long-run, the difference between the Baseline and Scenario 5 projections, using the January 2009 assumptions, turned out to be indistinguishable at the end of the projection period from their November 2008 counterparts. Consequently, the full analysis was conducted using the November 2008 macroeconomic assumptions.

4. Scenario Definitions

Each of the scenarios analysed are outlined below (technical terms are explained in a glossary presented in Appendix 1):

Scenario 1) *Implementation of Health Check reforms*[2]
Full decoupling of cereal direct payments, beef special premium and slaughter premium (cereal payments are fully decoupled in 2010, while beef payments are 50 per cent decoupled in 2010/11 and fully decoupled thereafter); Member States which used the options to retain the Suckler Cow Premium and/or Ewe Annual Premium (up to 50 per cent of value) retain these coupled; implementation of progressive modulation across the EU; phased increase of milk quotas between 2009 and 2013, followed by abolition in 2015.

Scenario 2) *Doha Round WTO reforms*
Implementation of Health Check reforms plus WTO reforms (based on the December 2008 draft modalities for agriculture paper (Falconer, 2008)). The WTO reforms entail: reductions of 70 per cent for top-tier tariffs; 64 per cent for 2nd tier tariffs; and 57 per cent for 3rd tier tariffs (phased in between 2010 and 2014). Beef, butter, cheese, poultry and pigmeat are designated sensitive products, with a two-thirds deviation in the tariff cut, but increased tariff rate quotas (TRQs) amounting to 4 per cent of domestic consumption (phased in between 2010 and 2014). With regards to products with several tariff lines such as beef, it is assumed that the increase in quota is allocated proportionately to existing TRQ's and countries. Export subsidies are eliminated in 2013. It is assumed that intervention prices are lowered, where necessary, to prevent the build up of stocks.

[2] See Moss *et al* (2008) for detailed analysis of the impact of the Health Check reforms on UK agriculture.

Scenario 3) *Full decoupling across the EU*
Same as scenario 2 but remaining coupled payments are incorporated into the Single Farm Payment (SFP) in 2010.

Scenario 4) *Further trade liberalisation*
Same as Scenario 3 except 4 per cent agriculture import tariffs. Further cuts in EU agriculture import tariffs to align EU tariffs with other sectors of the economy (phased in between 2010 and 2014). Sensitive status for designated products no longer applies.

Scenario 5) *Phasing out the Single Farm Payment with further trade liberalisation*
Same as Scenario 4 but with SFP phased out and equivalent funds for agri-environmental measures (phased out between 2010 and 2014). It is assumed that the measures funded have 70 per cent compliance costs and the residual retained by farmers has a zero production stimulating impact.

5. Results

The results for each of the scenarios are discussed below. Summary tables at the EU-27 level (Tables A1 to A4), the world level (Table A5), the UK level (Tables A6 to A9) and the Scottish level (Tables A10 to A13) are provided in Appendix 2.

5.1 Dairy Sector

Scenario 1: Implementation of Health Check reforms
The phased increase and eventual abolition of milk quotas under the Health Check reforms leads to a modest increase in projected EU milk production. As shown in Table A1, EU-27 milk production is 3 per cent higher under Scenario 1 compared to the Baseline at the end of the projection period (2018). More milk is available for manufacture and consequently, EU production of cheese, butter, skimmed milk powder (SMP) and whole milk powder (WMP) are higher under this scenario compared to the Baseline. Projected EU dairy commodity prices decline in response to the increases in production. Following the implementation of the Health Check reforms, EU exports to third countries increase, thereby increasing world supply. As a consequence, projected world butter, SMP and WMP prices are slightly lower under Scenario 1 compared to the Baseline (Table A5).

As in the rest of the EU, projected dairy commodity prices decline in the UK (Table A6). The fall in commodity prices exerts a downward impact on the Scottish producer milk price (Figure 1 and Table A10). By the end of the projection period, the producer milk price in Scotland under Scenario 1 is 3 per cent lower than the Baseline. Scottish milk production falls slightly in response to the decline in the producer milk price (Figure 2). Scotland milk production is 2 per cent lower under Scenario 1 compared to the Baseline in 2018.

The decline in milk production reduces the amount of milk available for manufacture. As a result, projected Scottish production of cheese and butter declines under Scenario 1, compared to the Baseline. In addition, the decline in

milk production has a downward impact on the number of dairy cows. By the end of the projection period there are 2 per cent fewer dairy cows in Scotland under Scenario 1 compared to the Baseline.

Scenario 2: Doha Round WTO reforms

Under the Doha WTO reforms scenario, it is assumed that butter and cheese are designated 'Sensitive Products', with moderated over-quota tariff cuts (23 per cent for butter as a top tier commodity and 21 per cent for cheese as a 2nd tier commodity) and increased TRQs. In contrast, the over-quota tariffs for SMP and WMP are reduced by the full 70 per cent and their TRQs remain unchanged.

The full 70 per cent cuts in over-quota tariffs for SMP and WMP do not lead to increases in third country imports into the EU market. Under the Baseline, SMP and WMP internal EU prices track external world prices and thus even small tariffs following Doha reforms are effective in protecting the EU market from the inflow of imports. As a consequence, projected EU SMP and WMP prices are not significantly different from those under Scenario 1.

The expansion in the TRQ for butter leads to an increase in butter imports into the EU from third countries in the early part of the projection period. By the end of the projection period, however, butter TRQ imports into the EU from third countries are zero due to internal (EU) and external (world) price movements. Under the Baseline, export subsidies for butter build up during the latter part of the projection period and consequently, the elimination of this form of support under Scenario 2 exerts a downward impact on the EU butter price. It is projected that the average EU butter price is 18 per cent lower under Scenario 2 compared to the Baseline in 2018[3]. Concurrently, the elimination of export subsidies reduces the supply of butter on the world market and has a positive impact on the projected world butter price. The internal and external prices for butter converge and from 2013 onwards the EU price tracks the world price. Since EU butter is competitive during the latter part of the projection period, butter TRQ imports drop to zero.

In contrast, the expansion in the TRQ for cheese results in a significant increase in projected cheese imports into the EU from third countries. By the end of the projection period, non-EU cheese imports are 164 per cent higher under Scenario 2, compared to the Baseline. Note the increase is large in percentage terms due to the low projected value in the baseline. The increase in imports exerts a downward impact on the EU cheese price.

The decline in EU commodity prices leads to a fall in EU producer milk prices. As a consequence, the expansion in EU milk production under Scenario 2 is slightly less than for Scenario 1. Under Scenario 2, projected EU-27 milk production is 2 per cent higher relative to the Baseline in 2018, while under Scenario 1 it is 3 per cent higher.

The decline in commodity prices has a downward impact on the Scottish producer milk price. It is projected that the Scottish producer milk price is 4 per cent lower under Scenario 2, compared to the Baseline. Comparing Scenario 2 to Scenario 1,

[3] It is necessary to reduce the intervention price for butter by 20 per cent to prevent a build up of intervention stocks.

this represents a 1 per cent fall. The large share of raw milk utilised in liquid milk in Scotland, diminishes the fall in the producer milk price.

The modest fall in the producer milk price has a small (less than 0.5 per cent) downward impact on Scottish milk production. Given the changes in relative commodity prices it is projected that there is a large decline in Scottish butter production in percentage terms (-18 per cent). Note, however, that this reflects the low levels of projected butter production in the Baseline. In absolute terms, this amounts to a decrease of 1.58 thousand tonnes.

Scenario 3: Full decoupling across the EU

Full decoupling has a negligible impact on the dairy sector as the dairy premium was fully incorporated in the SFP across the EU, under the Luxembourg CAP reforms. As a consequence, projected EU and Scottish price and production impacts under Scenario 3 are approximately equivalent to those under Scenario 2.

Scenario 4: Further trade liberalisation

Under this scenario, the over-quota tariffs for cheese, butter, SMP and WMP are reduced to 4 per cent. This equates to tariff cuts of 96 per cent compared to the Baseline. In addition, the cheese and butter TRQ expansions implemented under Scenario 2 are removed. Non-EU imports of cheese are lower under Scenario 4 compared to Scenario 3 due to the withdrawal of the TRQ expansion for this commodity. Nonetheless, projected non-EU imports of cheese are 27 per cent higher under Scenario 4 compared to the Baseline due to the reduction in over-quota tariffs. Projected butter, SMP and WMP non-EU imports remain unchanged since the EU prices for these commodities track world prices.

Projected EU milk production increases slightly under Scenario 4, compared to Scenario 3, due to cross commodity price impacts with the beef sector. Following further trade liberalisation the EU beef price falls significantly (see below) and this has a slight positive impact on milk production due to the relative returns between the beef and dairy sectors. The increase in EU milk production has a slight downward impact on dairy commodity prices. EU cheese, butter, SMP and WMP prices are slightly lower under Scenario 4 compared to Scenario 3.

Projected dairy commodity prices also decline in the UK in response to further trade liberalisation. As a consequence, the projected Scottish producer milk price is slightly lower under Scenario 4 relative to Scenario 3. The decline in producer milk price has a slight negative impact on Scottish milk production. Less milk is available for manufacture and as a result, it is projected that there are slight declines in the production of the cheese and butter.

Scenario 5: Phasing out the Single Farm Payment with further trade liberalisation

Phasing out the SFP removes the production stimulating impact of this payment on dairy production. As a result, it is projected that there is a slight decline in EU-27 milk production under Scenario 5 compared to Scenario 4 (overall projected EU-27 milk production under Scenario 5 is 2 per cent higher relative to the Baseline in 2018). The decline in milk production has a slight negative impact on the production of dairy commodities and as a result, dairy commodity prices are higher under Scenario 5 compared to Scenario 4. Compared to the Baseline, projected

average EU commodity prices under Scenario 5 for cheese, butter, SMP and WMP are 8 per cent, 19 per cent, 6 per cent and 4 per cent lower.

As in the rest of the EU, the phased elimination of the SFP exerts a small positive impact on UK dairy commodity prices. The knock-on impact on the Scottish milk producer price is, however, insignificant. In addition, phasing out the SFP has a negligible impact on projected Scottish milk production as the production enhancing impact of the dairy component of the SFP is small. Overall, projected Scottish milk production is 3 per cent lower under Scenario 5 compared to the Baseline[4].

Figure 1: Projected Scottish Producer Milk Price under the Baseline and Scenarios 1 to 5

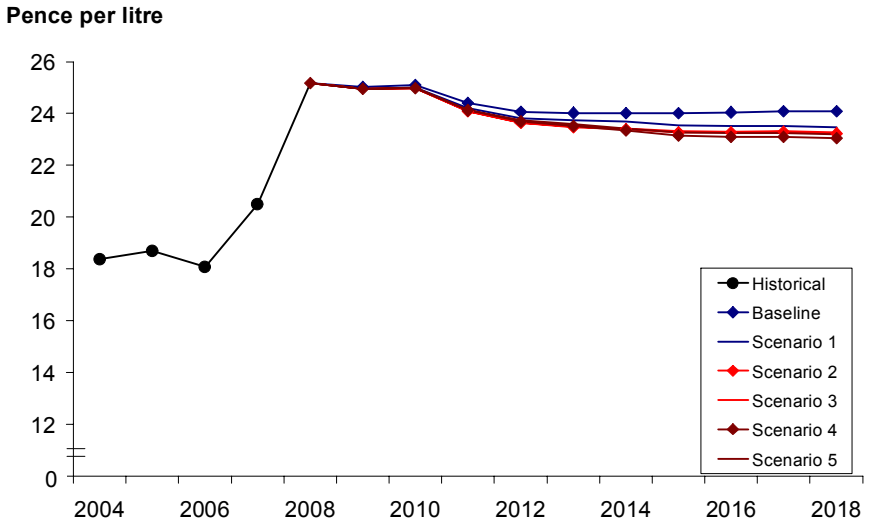
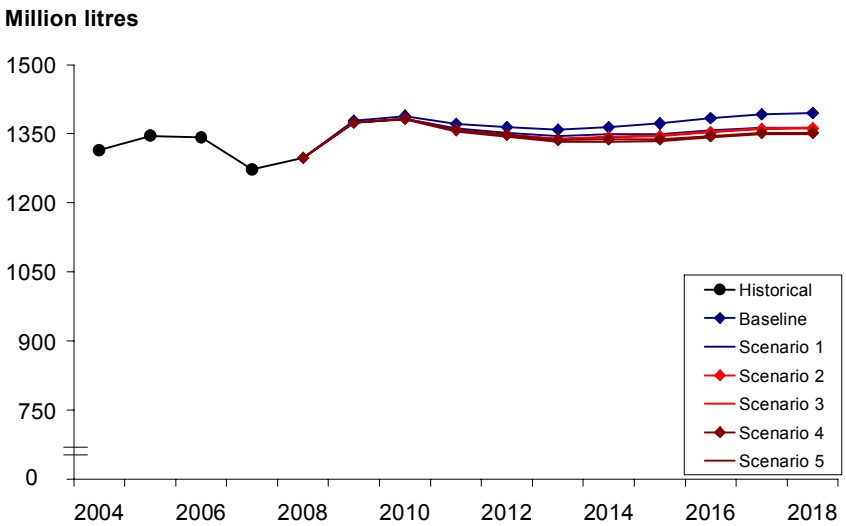


Figure 2: Projected Scottish Milk Production under the Baseline and Scenarios 1 to 5



[4] The projected impact of the phasing out of the SFP on Scottish milk production is based on the assumption that the SFP has a 10 per cent production stimulating impact for the dairy sector in the Baseline. If it is assumed within the Baseline that the production stimulating impact of the SFP is 30 per cent, Scottish milk production falls by a further 1 per cent following the phasing out of the SFP.

5.2 Beef Sector

Scenario 1: Implementation of Health Check reforms
Incorporating the beef special premium and the slaughter premium within the SFP and progressive modulation has a small negative impact on projected EU suckler cow numbers (Table A2). The impact is mitigated by the retention of a coupled Suckler Cow Premium in certain EU Member States, which helps to maintain EU suckler cow numbers. In contrast, there is a small increase in projected EU dairy cow numbers following the abolition of milk quotas under the Health Check reforms. Overall, EU beef production remains unchanged following the implementation of the Health Check reforms.

In Scotland the projected average price of finished beef animals is 1 per cent lower under Scenario 1 compared to the Baseline in 2018 (Figure 3 and Table A11). It is projected that Scottish suckler cow numbers are 1 per cent lower under Scenario 1 compared to the Baseline in 2018.

Scenario 2: Doha Round WTO reforms
Under this scenario, EU beef is designated a 'Sensitive Product' and the over-quota tariff is reduced by 23 per cent (i.e. a two-thirds deviation from the top-tier tariff reduction of 70 per cent). To compensate exporters for the moderated over-quota tariff cut, EU beef TRQs are increased by 4 per cent of domestic consumption.

Projected EU beef imports show a marked increase following the implementation of WTO reforms. EU beef imports are 43 per cent higher under Scenario 2 compared to the Baseline at the end of the projection period (this is equivalent to an extra 285 thousand tonnes). The reduction in the over-quota tariffs by 23 per cent contributes to the increase in EU beef imports, but the main factor driving the increase is the TRQ expansion. Note, however, that the increase in imports due to the TRQ expansion is based on non-Hilton TRQs. The expansion in the Hilton component does not in itself lead to a greater volume of high quality cuts since these were previously paying full tariffs and are assumed to be re-designated as TRQ imports (see Binfield *et al* (2008) for a detailed discussion of TRQs under WTO reforms).

The increase in EU beef imports exerts a downward impact on beef prices across the EU. The additional impact of the elimination of export subsidies on the beef price is minimal since it is projected that these fall to very low levels in the Baseline. Overall, the projected average EU beef price is 8 per cent lower under Scenario 2 compared to the Baseline at the end of the projection period.

The representative world beef price responds positively to the expansion in TRQs and is 3 per cent higher under Scenario 2 compared to the Baseline in 2018 (Table A5). Despite the fall in the internal EU price and rise in external world price, EU cattle prices remain higher and therefore uncompetitive compared to world prices.

The Scottish beef price falls by a similar amount as EU prices. The projected average Scottish price for finished beef animals is 8 per cent lower under Scenario 2 compared to the Baseline (Table A11). The lower Scottish beef price leads to a reduction in the size of the Scottish suckler cow herd under Scenario 2 compared to the Baseline (-5 per cent). As a consequence, there is a decline in the number of finished animals for marketing and it is projected that Scottish beef production is 4 per cent lower following the implementation of the Doha reforms at the end of

the projection period. The decline in beef production is less than the decline in suckler cows since some beef calves are sourced from the dairy herd.

Scenario 3: Full decoupling across the EU

The incorporation of the Suckler Cow Premium within the SFP, in Member States that retained this coupled payment, results in a further decline in EU suckler cow numbers. Projected EU-27 suckler cow numbers are 12 per cent lower under Scenario 3 compared to the Baseline in 2018. This represents a further 5 per cent fall in EU suckler cow numbers compared to Scenario 2. Despite the decline in suckler cow numbers, it is projected that there is only a slight decline in EU beef production under Scenario 3 compared to Scenario 2 (-1 per cent). A high proportion of beef production is sourced from the dairy herd in the EU and thus the decline in suckler cow numbers has a small negative impact on overall beef production. There is a corresponding positive impact on the EU beef price.

In Scotland, it is projected that the average price for finished beef animals is 1 per cent higher under Scenario 3 compared to Scenario 2. As a consequence, projected Scottish suckler cow numbers and beef production are marginally higher relative to Scenario 2.

Scenario 4: Further trade liberalisation

Under this scenario, beef over-quota tariffs are reduced to 4 per cent. This entails actual tariff cuts of 96 per cent. In addition, it is assumed that the 'Sensitivity' status for beef no longer applies and consequently the TRQ expansions implemented under Scenario 2 are removed. The over-quota tariff reductions lead to a substantial increase in EU beef imports. It is projected that EU beef imports are 191 per cent higher under Scenario 4 compared to the Baseline in 2018. This equates to a 1.3 million tonne increase in EU beef imports, compared to 662 thousand tonnes in the Baseline.

Projected internal EU beef prices decline markedly in response to this large increase in imports. By the end of the projection period, the projected average EU beef price is 26 per cent lower under Scenario 4 compared to the Baseline. In contrast, world prices respond positively to the increase in world beef trade and are 8 per cent higher compared to the Baseline in 2018. These internal and external price changes significantly narrow the gap between EU and Brazilian beef prices[5]. However, it is projected that the EU price still exceeds the Brazilian price since some tariffs still exist and transport and other trading costs prevent prices fully converging. In addition, quality differences and the EUs health and safety policies keep the EU price above that of Brazil.

The large projected decline in internal EU beef prices exerts a negative impact on projected EU suckler cow numbers and consequently beef production. EU suckler cow numbers are 23 per cent lower under Scenario 4 compared to the Baseline in 2018, while EU beef production is 7 per cent lower. In addition, the decline in beef prices leads to a 8 per cent increase in projected EU domestic consumption for beef. Following the further tariff cuts, EU imports account for a considerable share of domestic consumption. EU imports account for 21 per cent of EU domestic consumption under Scenario 4 in 2018, compared to 8 per cent in the Baseline (Table A3).

[5] Brazil is a key supplier of beef to the EU and thus this price differential is particularly important.

Projected cattle prices in Scotland fall by a comparable amount to the rest of the EU. The projected average Scottish price for finished beef animals is 26 per cent lower under Scenario 4 compared to the Baseline. There is a significant fall in suckler cow numbers in Scotland in response to the sharp decline in cattle prices. It is projected that Scottish suckler cow numbers fall by 17 per cent under Scenario 4, compared to the Baseline. Scottish beef production is projected to be 10 per cent lower in 2018 under Scenario 4, compared to the Baseline.

It should be noted that the results outlined above depend upon the EU's trade partners being able to supply the significant increase in imports. If the EU's trade partners cannot supply the projected increase in the level of EU imports reported under this scenario, the EU internal price would not fall to the same extent. Over the last year, South American beef prices have been particularly volatile, especially Brazil, and supply has been hampered by EU trade restrictions, availability of credit following the global downturn and drought conditions. In general, however, beef production in South America is extremely competitive and the majority of imports entering the EU in recent years have paid the full tariff. Providing traceability concerns can be met, cuts in import tariffs will further enhance South America's competitive position. While it would not be possible to supply such a large increase in imports in the short-term, the analysis is conducted over a ten year period providing the EU's trade partners time to significantly expand production.

Scenario 5: Phasing out the Single Farm Payment with further trade liberalisation
Although the SFP is fully decoupled, it is assumed under the Baseline and Scenarios 1 to 4 that this payment has a production stimulating effect mainly because of wealth effects. Thus, phasing out the SFP under Scenario 5 exerts a negative impact on projected EU suckler cow numbers and beef production. By the end of the projection period, EU suckler cow numbers are 29 per cent lower under Scenario 5 compared to the Baseline – i.e. EU suckler cow numbers are 6 per cent lower under Scenario 5 compared to Scenario 4. The average projected EU beef price is 25 per cent lower under Scenario 5 compared to the Baseline in 2018. This is 1 per cent higher compared to Scenario 4 and reflects the positive impact on prices of the fall in production.

The phased elimination of the SFP has a negative impact on suckler cow numbers in Scotland. Projected suckler cow numbers are 26 per cent lower in Scotland under Scenario 5 compared to the Baseline in 2018. Compared to Scenario 4, this represents an additional negative impact of 9 per cent. Overall, projected Scottish beef production is 15 per cent lower under Scenario 5 compared to the Baseline.

Figure 3: Projected Average Scottish Price for Finished Beef Animals under the Baseline and Scenarios 1 to 5

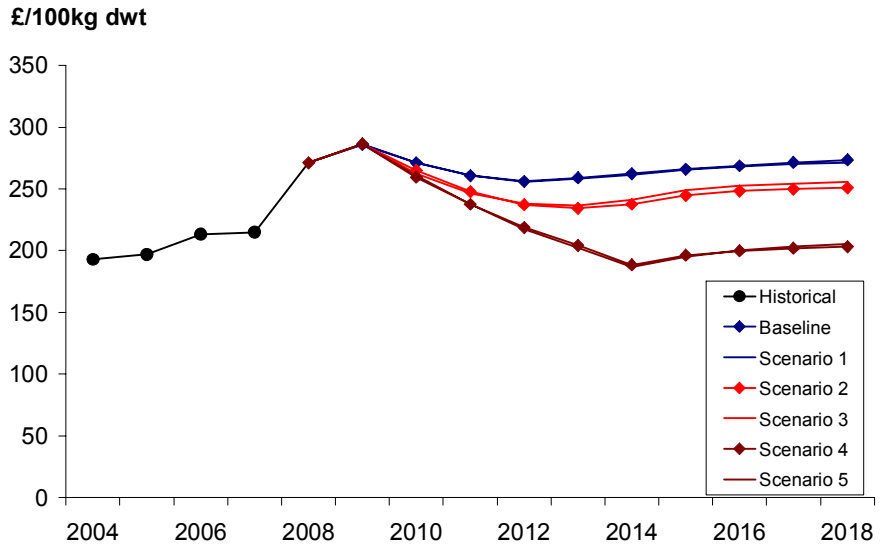
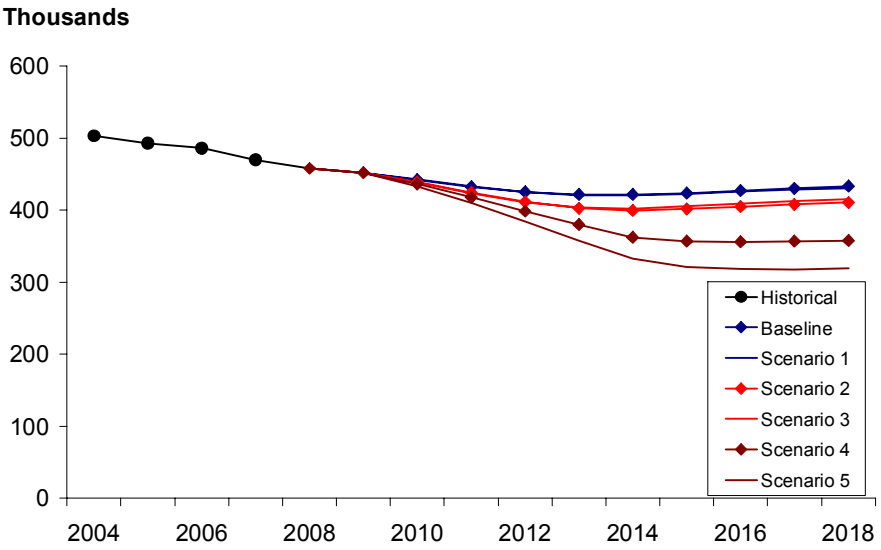


Figure 4: Projected Scottish Cows Number under the Baseline and Scenarios 1 to 5



5.3 Sheep Sector

Scenario 1: Implementation of Health Check reforms
Under the Health Check reforms scenario, it is assumed that Member States that previously used the option to retain the Ewe Annual Premium continue to keep this payment as coupled. As a consequence, it is projected that the implementation of the Health Check reforms have an insignifcant impact on EU production and sheepmeat prices (Table A2). Similarly, in Scotland projected sheepmeat production and prices are not significantly different under Scenario 1, compared to the Baseline (Table A11).

Scenario 2: Doha Round WTO reforms
Under the Doha reforms scenario it is assumed that sheepmeat is not designated a 'Sensitive Product' and consequently, the over-quota tariff is reduced by the full amount (64 per cent as a 2nd tier commodity) and therefore unlike the beef sector the existing TRQ is not expanded. It is projected that EU imports of sheepmeat from third countries increase in response to the over-quota tariff reductions. By the end of the projection period, non-EU imports are 26 per cent higher under Scenario 2 compared to the Baseline. This represents an increase of 81 thousand tonnes of non-EU sheepmeat imports.

Projected EU sheepmeat prices decline in response to the increase in non-EU imports. The elimination of export subsidies has no impact on sheepmeat prices since this form of support is not employed in the sheep sector. The reduction in price reduces the economic incentive to produce lamb and it is projected that EU ewe numbers and sheepmeat production fall by 3 per cent in 2018, compared to the Baseline. Conversely, projected EU-27 domestic consumption increases due to the decline in sheepmeat prices. Following the implementation of Doha reforms, non-EU imports account for a greater share of domestic consumption, rising from 20 to 25 per cent (Table A3).

Following the Doha WTO reforms, the projected Scottish clean sheep price is 6 per cent lower in 2018, compared to the Baseline (Figure 5). The decline in sheepmeat prices triggers de-stocking, with ewe numbers falling by 5 per cent in Scotland. Consequently, projected Scottish sheepmeat production is 4 per cent lower under Scenario 2 compared to the Baseline.

Scenario 3: Full decoupling across the EU
The full incorporation of the coupled ewe premium within the SFP exerts a small downward impact on EU ewe numbers. Projected EU ewe numbers are 5 per cent lower in 2018 under Scenario 3, compared to the Baseline. This represents an additional negative impact of 2 per cent compared to Scenario 2. The modest impact is partly explained by the fact that returns to the sheep sector in southern regions of the EU are boosted by sheep-milk production, which helps to sustain sheep farming in those regions. EU sheepmeat production falls by 1 per cent.

Compared to Scenario 2, the projected Scottish clean sheep price is 1 per cent higher in 2018 under Scenario 3. Scotland fully incorporated the ewe premium within the SFP under the Luxembourg CAP Reforms and thus this policy change does not directly affect Scottish sheep producers. It is projected, however, that Scottish ewe numbers and sheepmeat production are marginally higher under Scenario 3 compared to Scenario 2 due to the small positive price impact.

Scenario 4: Further trade liberalisation
Under the further trade liberalisation scenario, EU sheepmeat over-quota tariffs are reduced to 4 per cent. It is projected that the tariff reduction leads to a substantial increase in imports from third countries, with non-EU sheep imports 60 per cent higher under Scenario 4 compared to the Baseline. This equates to an additional 187 thousand tonnes. EU sheepmeat prices are projected to decline in response to the large increase in imports and are 10 per cent lower under Scenario 4, compared to the Baseline.

Lower market prices exert a downward impact on projected ewe numbers and sheepmeat production. In contrast, EU domestic consumption increases in response to the lower price. Overall, projected non-EU imports account for 30 per cent of EU domestic consumption under Scenario 4, compared to 20 per cent under the Baseline (Table A3).

In Scotland, the average price of finished sheep and lambs is 12 per cent lower under Scenario 4 compared to the Baseline. The decline in price reduces sheepmeat economic returns and depresses ewe numbers. By the end of the projection period, projected Scottish ewe numbers are 8 per cent lower under Scenario 4 compared to Scenario 3. Overall, Scottish sheepmeat production is 7 per cent lower in 2018 under Scenario 4 compared to Scenario 3.

As in the beef sector, the projected changes in the sheep sector are subject to the ability of the EU's trade partners to meet the substantial increase in non-EU imports. Adverse weather conditions and the movement of sheep producers to the dairy sector contributed to a large reduction in the New Zealand breeding flock in 2008. As a result, it is unlikely that New Zealand will meet its import quota with the EU in the near term (AHDB Meat Services, 2008). The increase in non-EU sheepmeat imports reported above, however, is over a ten year period. The ability of trade partners (particularly New Zealand) to meet a large increase in non-EU imports in the long-term partly depends on the relative returns between the sheep and dairy sectors. The most recent evidence indicates that conversions to the dairy sector in New Zealand have slowed down due to the dramatic drops in dairy commodity prices in the latter part of 2008 (USDA, 2009).

Scenario 5: Phasing out the Single Farm Payment with further trade liberalisation
Phasing out the SFP on top of further trade liberalisation has a negative impact on EU ewe numbers since it is assumed this payment has a production stimulating impact. As a result, projected EU-27 ewe numbers are 2 per cent lower under Scenario 5 compared to Scenario 4. Overall, EU-27 ewes are 10 per cent lower under Scenario 5 compared to the Baseline. EU sheepmeat production falls by a comparable amount. The decline in production has a small positive impact on EU and UK sheepmeat prices.

Ewe numbers also decline significantly in Scotland under Scenario 5 in response to the phased elimination of the SFP (Figure 6). Projected Scottish ewe numbers are 17 per cent lower under Scenario 5 compared to the Baseline in 2018. The decline in numbers in Scotland and elsewhere in the UK is more severe compared to the EU because sheep producers in Southern Europe are less dependent on the SFP.

Figure 5: Projected Average Scottish Price of Clean Sheep under the Baseline and Scenarios 1 to 5

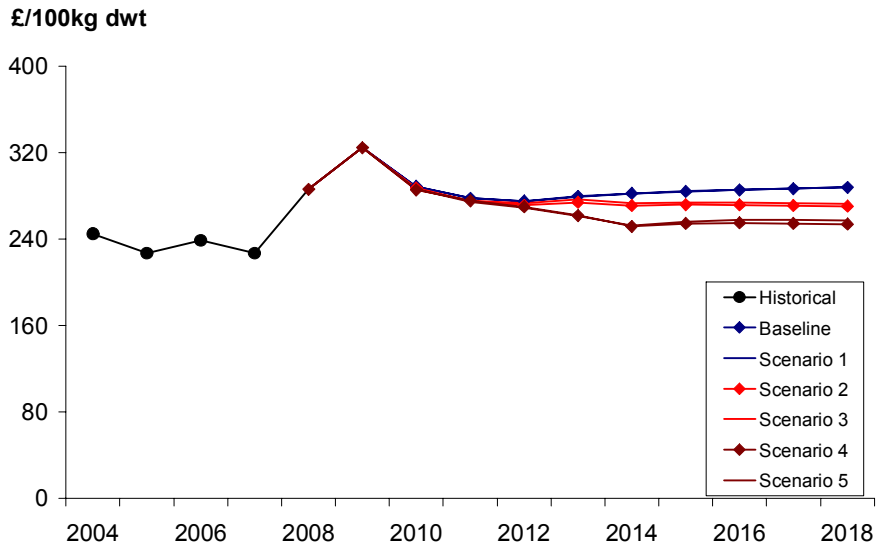
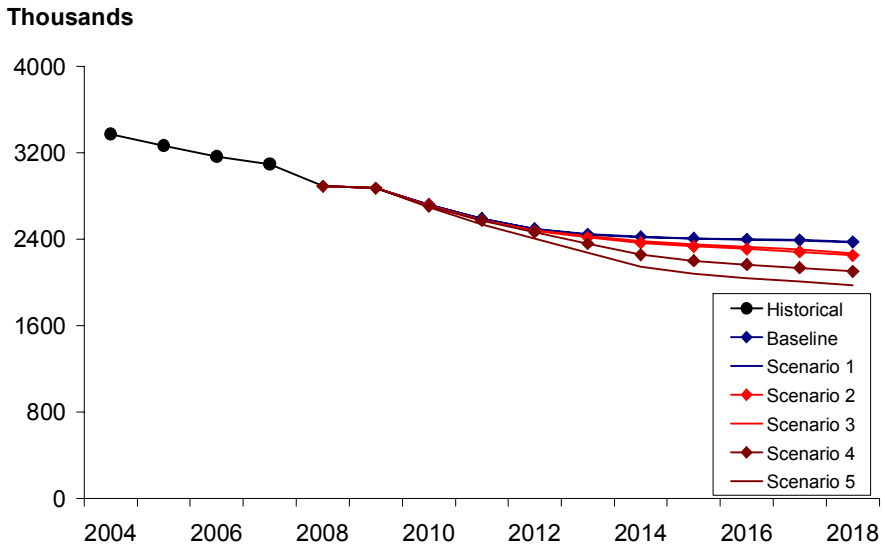


Figure 6: Projected Scottish Ewe Numbers under the Baseline and Scenarios 1 to 5



5.4 Pig Sector

Scenario 1: Implementation of Health Check reforms
The Common Agricultural Policy does not directly address the pig sector other than indirectly through the crop market since feed costs are strongly influenced by crop prices. As discussed below, it is projected that the Health Check reforms have little impact on the crop sector and thus pigmeat prices and production in the EU and Scotland remain unchanged under Scenario 1, compared to the Baseline (Tables A2 and A11).

Scenario 2: Doha Round WTO reforms
Under the Doha WTO scenario it is assumed that pigmeat is designated a 'Sensitive Product', with a moderated over-quota tariff cut (19 per cent as a 3rd tier commodity) and an expanded TRQ. It is projected that non-EU pigmeat imports increase by the full amount of the TRQ expansion (i.e. 4 per cent of EU consumption). Given the low level of projected non-EU imports in the Baseline, this results in a very large increase in imports from third countries in percentage terms. Projected non-EU imports are 1681 per cent higher under Scenario 2, compared to the Baseline. In absolute terms, non-EU pigmeat imports increase by 840 thousand tonnes.

Projected EU pigmeat prices are 5 per cent lower than the Baseline at the end of the projection period. The price drop reflects the combined impact of the increase in non-EU imports and the elimination of export subsidies. The volume of pigmeat export subsidies, however, is small relative to the size of the overall EU pigmeat sector and as a consequence, eliminating this form of support has a small negative impact on pigmeat prices. The world pigmeat price increases in response to the increase in non-EU imports and is 9 per cent higher under Scenario 2 compared to the Baseline at the end of the projection period (Table A5). As a consequence, the gap between internal and external prices diminishes.

It is projected that the decline in EU pigmeat prices results in lower EU-27 sow numbers and pigmeat production. Notwithstanding the pigmeat price drop, EU-27 domestic consumption remains the same under Scenario 2 relative to the Baseline due to cross price effects with other meats. Following the Doha WTO reforms, projected non-EU imports account for a greater share of domestic consumption, rising from 0.2 per cent under the Baseline, to 4 per cent under Scenario 2 (Table A3).

Projected pigmeat prices in Scotland fall by a similar amount as EU prices. The lower price level exerts a downward impact on sow numbers and pigmeat production. Projected Scottish sow numbers and pigmeat production are 4 and 5 per cent lower in 2018 under Scenario 2, compared to the Baseline.

Scenario 3: Full decoupling across the EU
It is projected that full decoupling across the EU has no impact on the EU and Scottish pig sectors.

Scenario 4: Further trade liberalisation
Under the further trade liberalisation scenario, the pigmeat over-quota tariff is reduced to 4 per cent and the TRQ expansion implemented under Scenario 2 is

removed. Although the TRQ expansion is removed, the tariff reduction leads to a substantial increase in non-EU imports. Projected non-EU imports are 1367 per cent higher under Scenario 4 compared to the Baseline (again, this is relative to a very low base level of imports). This equates to an absolute increase of 684 thousand tonnes. The inflow of imports following the tariff cuts under Scenario 4 are slightly lower to those under Scenario 2 in which the TRQ is expanded.

It is projected that the EU pigmeat price is 6 per cent lower under Scenario 4, compared to the Baseline. Projected EU-27 sow numbers and production under Scenario 4 closely resembles those under Scenario 3. It is projected that domestic consumption declines slightly primarily in response to the significant beef price drop. Under Scenario 4, non-EU imports account for 3 per cent of domestic consumption, compared to zero per cent in the Baseline (Table A3).

In Scotland, it is projected that the pigmeat price under Scenario 4 is slightly lower compared to that under Scenario 3. Projected sow numbers and pigmeat production decline slightly in response to the price impact.

Scenario 5: Phasing out the Single Farm Payment with further trade liberalisation
It is projected that the additional impact of the phased elimination of the SFP on EU pigmeat prices and production is limited. Similarly, in Scotland pigmeat prices and production projections under Scenario 5 closely resemble those under Scenario 4.

5.5 Poultry Sector

Scenario 1: Implementation of Health Check reforms
Similar to the pig sector, implementation of the Health Check reforms has little impact on the EU and Scottish poultry sectors (Tables A2 and A11).

Scenario 2: Doha Round WTO reforms
Under the Doha WTO reform scenario, poultry is designated a 'Sensitive Product', with a moderated over-quota tariff cut (21 per cent as a 2nd tier commodity) and a TRQ expansion amounting to 4 per cent of domestic consumption. Projected non-EU poultry imports are 44 per cent higher under Scenario 2 compared to the Baseline (Table A2), i.e. an additional 322 thousand tonnes. The increase in actual volume of imports is below the full 4 per cent of consumption expansion in the TRQ since imports that previously paid the full tariff are re-designated TRQ imports.

The increase in non-EU imports and elimination of export subsidies has a depressing impact on the EU poultry price and consequently, poultry production. By the end of the projection period, EU-27 poultry production is 4 per cent lower under Scenario 2 compared to the Baseline. Domestic consumption increases by 1 per cent. Overall, following the Doha WTO reforms non-EU poultry imports account for a greater share of domestic consumption, rising from 6 to 9 per cent (Table A3).

In Scotland, the projected poultry price is 9 per cent lower under Scenario 2 compared to the Baseline (Table A11). It is projected that the decline in price exerts a small negative impact on the Scottish poultry production (-2 per cent).

The limited production impact reflects the weak observed relationship between price and production throughout the UK.

Scenario 3: Full decoupling across the EU
Full decoupling across the EU has no significant impact on the EU and Scottish poultry sectors since direct payments are not associated with the poultry sector.

Scenario 4: Further trade liberalisation
Under the further trade liberalisation scenario, the 'Sensitivity' status implemented under Scenario 2 no longer applies and consequently the TRQ expansion is removed. In addition, the over quota tariff is reduced to 4 per cent. The reduction in the over quota tariff results in a significant increase in poultry imports from third countries. It is projected that non-EU imports are 56 per cent higher under Scenario 4 compared to the Baseline, i.e. an absolute increase of 415 thousand tonnes.

In response to the increase in imports, the EU poultry price falls by an additional 3 per cent compared to Scenario 3 and EU poultry production falls by an additional 2 per cent. Projected domestic consumption falls slightly due to cross price effects with other meats. Following further trade liberalisation, non-EU imports account for 9 per cent of domestic consumption.

As in the EU, the further liberalisation of trade has a negative impact on the Scottish poultry price. It is projected that the Scottish poultry price is 12 per cent lower under Scenario 4 compared to the Baseline. Although this represents a significant decline in price, this drop is relative to projected prices that are high in comparison to the beginning of the decade. The decline in price has an insignificant impact on poultry production.

Scenario 5: Phasing out the Single Farm Payment with further trade liberalisation
It is projected that the phased elimination of the SFP has a negligible impact of prices and production in the EU and Scottish poultry sectors.

5.6 Crop Sector

Scenario 1: Implementation of Health Check reforms
The incorporation of the Arable Aid Payment within the SFP within remaining Member States has a negligible impact on the crop sector in the EU and Scotland. Projected EU and Scottish wheat, barley and oat prices (Tables A4 and A12) are marginally higher under Scenario 1 compared to the Baseline (+1 per cent) because the projected increase in EU dairy cow numbers has a small positive impact on the demand for feed.

Scenario 2: Doha Round WTO reforms
Under the Doha WTO reform scenario, it is assumed that the over-quota tariffs for wheat, barley, maize and rapeseed are reduced by the full amount (64 per cent as a 2nd tier commodity). The existing TRQs for these commodities remain unchanged. It is projected that the reduction in import tariffs for crop

commodities do not result in increased non-EU imports since EU prices closely follow world prices. In addition, export subsidies for crop commodities are not required in the Baseline and hence the elimination of this form of support has no impact.

Nonetheless, EU and Scottish wheat, barley, rapeseed and oat prices are slightly lower under Scenario 2 compared to the Baseline. The small negative price impact reflects the fall in the demand for feed in response to the lower projected livestock numbers.

Scenario 3: Full decoupling across the EU
Cereal payments were fully incorporated within the SFP across the EU under the Health Check reform scenario (Scenario 1) and thus it is projected that EU and Scottish crop prices and production remain unchanged.

Scenario 4: Further trade liberalisation
Under the further trade liberalisation scenario, over-quota import tariffs are reduced to 4 per cent. Non-EU crop imports from third countries are not projected to increase in response to the tariff reductions since EU prices track world prices. As a result, EU and Scottish commodity prices under Scenario 4 closely resemble those under Scenario 3. It is projected that Scottish barley production declines slightly (-2 per cent) in response to the lower projected livestock numbers since a significant proportion of barley is of low quality and used for feed purposes.

Scenario 5: Phasing out the Single Farm Payment with further trade liberalisation
The phased elimination of the SFP on top of further trade liberalisation has a small impact on the crop sector. EU and Scottish wheat, barley and rapeseed prices remain unchanged. It is projected that there is a further small decline in Scottish barley production under Scenario 5 compared to Scenario 4 due to the projected decline in livestock numbers and hence feed demand.

5.7 Market Receipts and Feedstuff Costs

Projected Scottish total market receipts are 17 per cent lower in 2018 under Scenario 5 compared to the Baseline (Table A9). The decline in total market receipts is greater in Scotland compared to the UK as a whole (-13 per cent) since beef and sheep production are particularly important to the Scottish agricultural economy and these sectors suffer the greatest fall in market receipts. Beef sector market receipts are 35 per cent lower following the implementation of the policy changes due to the projected significant decline in prices and production. Sheep market receipts are 23 per cent lower under Scenario 5 compared to the Baseline.

The policy reforms have a more modest negative impact on dairy market receipts. It is projected that dairy market receipts are 7 per cent lower following the implementation of the policy changes. Likewise, total crop market receipts are slightly lower (-4 per cent).

The decline in total market receipts is partially offset by a decline in feedstuff costs. The decline in feedstuff costs primarily reflects the fall in livestock

numbers. Total feedstuff costs are 9 per cent lower in 2018 under Scenario 5 compared to the Baseline.

The transfer of funds from Pillar 1 and Pillar 2 under Scenario 5 significantly reduces the level of direct payments retained by farmers since it is assumed these are directed towards agri-environmental measures with associated compliance costs. In Scotland, 'Total Market Receipts plus Retained Direct Payments' are 27 per cent lower under Scenario 5 compared to the Baseline.

6. Conclusions

The impact of the key policy reforms underlying the UK government's long-term vision for CAP on Scottish agriculture is examined using a partial equilibrium modelling framework. Five policy scenarios are analysed. The first three scenarios (implementation of Health Check reforms (Scenario 1), Doha Round WTO reforms (Scenario 2) and full decoupling across the EU (Scenario 3)) address policy changes that are likely to occur prior to the consideration of the reforms related to the 'Vision' proposals. Scenarios 4 and 5 incorporate the main policy changes proposed under 'Vision'. Specifically, the modelling system is simulated with reduced import tariffs for all agricultural commodities in line with other sectors of the economy (Scenario 4) and the phased elimination of the SFP (Scenario 5)[6].

Apart from the dairy sector, the implementation of the Health Check reforms (Scenario 1) has a negligible impact on agriculture in Scotland. Within the Scottish dairy sector, it is projected that the phased increase and eventual abolition of milk quotas under the Health Check reforms has a depressing impact on the producer milk price and production.

The Doha Round WTO reforms (Scenario 2) exert a further downward impact on the Scottish producer milk price and production. This impact reflects a decline in the commodity prices of butter and cheese due to increased tariff rate quotas and, in the case of butter, the elimination of export subsidies. It is also projected that the Doha Round WTO reforms have a downward impact on prices and production in the Scottish meat sectors. This is driven by increased tariff rate quotas within the beef, pig and poultry sectors, while the over-quota tariff reduction exerts a downward impact on prices and production in the sheepmeat sector. In contrast, it is projected that the cuts in import tariffs under the Doha WTO reform scenario have a marginal impact on Scottish crop prices since EU crop prices closely track their world prices.

Full decoupling across the EU (Scenario 3) has a marginal impact on agriculture in Scotland. Scotland implemented full decoupling under the 2003 CAP reforms and thus this policy change has no direct impact. Moreover, the price impact due to falls in production elsewhere in the EU is limited.

The impact of reduced import tariffs in line with other sectors of the economy under Scenario 4 is mixed. Within the Scottish dairy sector, it is projected that

[6] Vision also calls for the abolition of price support measures and export subsidies. Under all the scenarios it is assumed that intervention prices are lowered, where necessary, to avoid the build up of stocks. Under Scenarios 2 to 5 it is necessary to reduce the intervention price for butter by 20 per cent. Export subsidies, meanwhile, are abolished under the Doha WTO reform scenario (Scenario 2).

producer milk prices and production fall slightly in response to the import tariff cuts. The impact is fairly modest since following the abolition of milk quotas and the elimination of export subsidies, EU commodity prices are closely linked to world prices and the lower tariffs still stem the inflow of imports into the EU market. Similarly, extensive crop tariff cuts have a negligible impact on Scottish crop prices.

In contrast, the reduction in import tariffs under Scenario 4 leads to significantly lower projected Scottish beef prices and production. Extensive trade liberalisation results in a significant increase in projected non-EU beef imports since cuts in over-quota import tariffs further enhances the competitive position of South American beef compared to indigenous EU beef. These results highlight the importance of the 'Sensitive Status' for beef. Under the Doha WTO scenario (Scenario 2), beef is designated a 'Sensitive Product' and the moderated tariff cuts partially protect the EU market from imports. As a result, the negative price impact under Scenario 2 is modest relative to Scenario 4.

Likewise, extensive trade liberalisation has a depressing impact on Scottish sheepmeat prices and production. The cuts in the sheepmeat tariffs lead to a significant increase in third country sheepmeat imports. The projected Scottish clean sheep price is 12 per cent lower under Scenario 4 compared to the Baseline.

Elimination of the SFP on top of further liberalisation exerts further downward pressure on Scottish beef and sheep production (Scenario 5). Overall, projected Scottish beef production is 15 per cent lower in 2018 under Scenario 5 compared to the Baseline, while Scottish sheepmeat production is 16 per cent lower. Phasing out the SFP has a negligible impact on projected Scottish milk production since the production enhancing impact of the dairy component of the SFP is small. Similarly, phasing out the SFP has a small impact on the crops sector.

The negative impact of the phasing out the SFP on the EU and Scottish agricultural sectors is somewhat alleviated by the fact that it is assumed that producers still receive equivalent amounts of payments in the form of environmental payments. This assumption arises from the Commission's commitment to the transfer of funds from Pillar 1 to Pillar 2 and recognition within the Vision document that farming should be environmentally sensitive. Abolition of the SFP, without enhanced agri-environmental payments, would dramatically reduce total farm receipts and trigger significant structural change.

Although the modelling framework used in this study focuses on changes within the agricutral sector, it is important to acknowledge that the large projected declines in beef and sheep numbers under the 'Vision' scenarios would have wider implications on the environment, economy and social cohesion of rural areas. The potential impact on the environment is mixed. Reductions in cattle and sheep numbers may have a positive or adverse impact on biodiversity depending on existing grazing levels. Moreover, it is likely that the impact would be spatially uneven, with more marginal producers in upland areas experiencing greater contractions in output[7]. As a result, undergrazing is likely to be more problematic in the uplands. In more remote areas land may even be abandoned, which also negatively affects biodiversity (Hanley *et al*, 2008). Thus, if the SFP is eliminated,

[7] For example, using a general equilibrium framework that distinguishes between LFA and non-LFA farms in Scotland, Gelan and Schwarz (2008) projected that the former reduces output by twice as much as the latter following the introduction of the SFP.

Agri-environmental schemes will need to play an important role in minimising adverse affects on biodiversity.

Reductions in livestock numbers will not only hasten the decline in agricultural employment but also employment within the wider rural economy. Agricutural employment supports both upstream (e.g. feed companies and machinery suppliers) and downstream employment (e.g. abattoirs and food suppliers) (Institute for European Environmental Policy et al., 2004). It is estimated that the agricultural employment multiplier for Scotland is 1.85, implying that each job in farming supports an extra 0.85 jobs elsewhere in the economy (Croasdale *et al.*, 2009). Furthermore, farmers play an active social role within local communities through participating on school boards, running local activies *etc*. Reducing the viability of farming may undermine the positive contribution played by farmers within local communities (Institute for European Environmental Policy et al., 2004). Any decline in numbers engaged in agriculture may also have a direct impact on migration out of the remoter areas, hence undermining the viability of the rural population in these areas.

The proposed 'Vision' reforms also have important implications on price volatility. Export subsidies and import tariffs have protected the EU market from the consequences of world price volatility. Following extensive trade liberalisation, it is projected that EU commodity prices are more closely linked to world prices. As a result, EU producers and processors will tend to face more uncertainty due to increased volatility as a result of external shocks, such as those due to poor weather conditions. Increased uncertainty has a negative impact on efficient production in the agricultural sectors through discouraging investment and threatening the long-term survival of producers.

It must be recognised that the policy changes considered under scenarios 4 and 5 represent significant departures from existing policies. Inevitably, there is a greater degree of uncertainty associated with these more extreme policy scenarios. Econometric approaches, such as that used in this study, employ historic data to derive coefficients of demand and supply relationships and therefore reflect existing farm structures. Fundamental changes in farm policy could lead to major structural changes that are difficult to capture from a modelling perspective. As with other quantitative approaches, the FAPRI modelling system provides an indication of the impacts associated with these extreme policy changes and care should be taken in the interpretation of the projected impacts.

It was also highlighted that the impact of further trade liberalisation (Scenario 4) in the beef and sheep sectors is dependent upon the capacity of third countries to supply the EU. In the modelling system third countries meet the significant increase in non-EU imports. If the EU's trade partners could not meet this increase, the decline in EU prices would be less marked.

The impact of the elimination of the SFP is also dependent upon the assumptions regarding the production stimulating impact of the SFP (30 per cent in the beef, sheep and crop sectors and 10 per cent in the dairy sector). If it was assumed the production stimulating impact of the SFP is higher (lower) within the Baseline, then eliminating this payment would lead to a larger (smaller) decline in production. As discussed in Section 3, the assumptions employed within the FAPRI modelling system are based on empirical/research evidence in the US where decoupled payments have been in place for a longer period than the EU. The impact of the 10 per cent assumption in the dairy sector was assessed using an alternative 30 per

cent assumption. It was shown that this assumption does not significantly alter the results.

In conclusion, the Health Check Reforms have minimal impact on Scottish agriculture, but should the 'Vision' proposal be implemented the consequences for the Scottish beef and sheep sectors, in particular, would be dramatic.

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Appendix 1: Glossary

Decoupling	Removal of link between direct payment and numbers of cattle/sheep and hectares of cereals etc. Under the 2003 CAP reform many production direct payments based on the numbers of hectares or number of livestock were replaced with the Single Farm Payment, which is based on historic subsidy receipts or area farmed or combination of both.
Export subsides	Subsidy to cover the difference between internal and world market prices.
Hilton tariff rate quota	Tariff rate quota for high quality beef.
National Envelope	Mechanism introduced under the 2003 CAP reform that enables up to 10 per cent of the SFP to be redirected to measures that protect or enhance the environment or to improve the quality and marketing of agricultural products.
Sensitive products	Products that are not subject to full tariff reductions. Under the December 2008 draft modalities for agriculture paper (Falconer, 2008) each developed member state can designate up to 4-6 per cent of tariff lines as "Sensitive Products".
Tariff rate quota	Quantity of imports that enter at a lower tariff rate (see *tariff regime*).
Tariff regime	A two-tier tariff regime with associated quotas was introduced under the Uruguay Round Agreement on Agriculture. A lower tariff is applied to a specified quantity of imports (*in-quota tariff*) and a higher tariff is applied to subsequent imports above this level (*over-quota tariffs*).

Appendix 2: Scenario Summary Tables

Table A1: EU-27 Dairy Sector Results
(Percentage difference in 2018 compared to Baseline)

	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Dairy cows	2%	2%	2%	3%	2%
Milk production	3%	2%	1%	3%	2%
Fluid consumption	1%	2%	2%	2%	2%
Manufacturing use	4%	2%	1%	4%	3%
Cheese					
Production	2%	1%	1%	3%	2%
Non-EU imports	-1%	164%	164%	27%	44%
Domestic cons.	2%	3%	2%	3%	3%
Non-EU exports	8%	16%	15%	15%	11%
Butter					
Production	5%	0%	0%	3%	1%
Non-EU imports	0%	0%	0%	0%	0%
Domestic cons.	1%	4%	4%	4%	4%
Non-EU exports	71%	-56%	-60%	-28%	-49%
SMP					
Production	10%	-4%	-5%	0%	-4%
Non-EU imports	0%	0%	0%	0%	0%
Domestic cons.	2%	0%	0%	1%	1%
Non-EU exports	36%	-21%	-23%	-7%	-21%
WMP					
Production	14%	20%	19%	24%	20%
Non-EU imports	1%	1%	1%	1%	1%
Domestic cons.	1%	1%	1%	1%	1%
Non-EU exports	25%	37%	36%	45%	37%
Prices					
Milk, 3.7% fat	-6%	-10%	-10%	-12%	-10%
Cheese market	-6%	-8%	-8%	-10%	-8%
Butter market	-3%	-18%	-18%	-20%	-19%
SMP market	-7%	-5%	-5%	-7%	-6%
WMP market	-5%	-3%	-3%	-5%	-4%
Butter intervention	0%	-20%	-20%	-20%	-20%
SMP intervention	0%	0%	0%	0%	0%

Scenario 1: Implementation of Health Check reforms
Scenario 2: Doha Round WTO reforms
Scenario 3: Full decoupling across the EU
Scenario 4: Further trade liberalisation
Scenario 5: Phasing out the Single Farm Payment with further trade liberalisation

Table A2: EU-27 Livestock Sector Results
(Percentage difference in 2018 compared to Baseline)

	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Livestock Numbers					
Dairy Cows	2%	2%	2%	3%	2%
Suckler Cows	-3%	-7%	-12%	-23%	-29%
Sows	0%	-4%	-4%	-4%	-4%
Ewes	-1%	-3%	-5%	-8%	-10%
Beef					
Production	0%	-2%	-3%	-7%	-8%
Non-EU imports	-1%	43%	53%	191%	197%
Domestic cons.	0%	2%	1%	8%	8%
Non-EU exports	0%	0%	0%	0%	0%
Sheepmeat					
Production	-1%	-3%	-4%	-7%	-10%
Non-EU imports	0%	26%	28%	60%	64%
Domestic cons.	-1%	3%	2%	6%	5%
Non-EU exports	0%	0%	0%	0%	0%
Pigmeat					
Production	0%	-4%	-4%	-5%	-5%
Non-EU imports*	0%	1681%	1681%	1367%	1368%
Domestic cons.	0%	0%	0%	-2%	-1%
Non-EU exports	0%	-7%	-7%	-6%	-6%
Poultry					
Production	0%	-4%	-4%	-6%	-6%
Non-EU imports	0%	44%	44%	56%	56%
Domestic cons.	0%	1%	1%	-1%	0%
Non-EU exports	0%	-35%	-35%	-34%	-34%
Prices					
Beef	0%	-8%	-6%	-26%	-25%
Sheepmeat	1%	-5%	-4%	-10%	-9%
Pigmeat	0%	-5%	-5%	-6%	-6%
Poultry	1%	-6%	-6%	-9%	-9%

* The large percentage increases reflect the very low base level of pigmeat non-EU imports.

Scenario 1: Implementation of Health Check reforms
Scenario 2: Doha Round WTO reforms
Scenario 3: Full decoupling across the EU
Scenario 4: Further trade liberalisation
Scenario 5: Phasing out the Single Farm Payment with further trade liberalisation

Table A3: Non-EU Imports as a Percentage of Domestic Consumption (Percentage, 2018)

	Baseline	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Beef	8%	8%	11%	12%	21%	22%
Sheepmeat	20%	20%	25%	25%	30%	31%
Pigmeat	0%	0%	4%	4%	3%	3%
Poultry	6%	6%	9%	9%	9%	9%

Scenario 1: Implementation of Health Check reforms
Scenario 2: Doha Round WTO reforms
Scenario 3: Full decoupling across the EU
Scenario 4: Further trade liberalisation
Scenario 5: Phasing out the Single Farm Payment with further trade liberalisation

Table A4: EU-27 Crop Sector Results (Percentage difference in 2018 compared to Baseline)

	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Area					
Wheat	0%	0%	0%	0%	-1%
Barley	0%	0%	0%	0%	0%
Rapeseed	-1%	0%	0%	0%	-1%
Wheat					
Production	0%	0%	0%	0%	0%
Domestic cons.	0%	-1%	-1%	0%	-1%
Net exports	-2%	4%	5%	4%	5%
Barley					
Production	0%	0%	0%	0%	0%
Domestic cons.	0%	-1%	-1%	-1%	-1%
Net exports	-2%	4%	4%	3%	3%
Rapeseed					
Production	0%	0%	0%	0%	-1%
Domestic cons.	0%	0%	0%	0%	0%
Net exports	4%	2%	2%	3%	8%
Prices					
Wheat	1%	-2%	-2%	-1%	-1%
Barley	1%	-2%	-2%	-1%	-1%
Rapeseed	0%	-1%	-1%	-1%	-1%

Scenario 1: Implementation of Health Check reforms
Scenario 2: Doha Round WTO reforms
Scenario 3: Full decoupling across the EU
Scenario 4: Further trade liberalisation
Scenario 5: Phasing out the Single Farm Payment with further trade liberalisation

Table A5: World Price Results
(Percentage difference in 2018 compared to Baseline)

	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Dairy					
Cheese	1%	1%	1%	-1%	-1%
Butter	-4%	3%	3%	1%	3%
SMP	-2%	0%	1%	-1%	0%
WMP	-4%	-3%	-2%	-5%	-3%
Meat					
Beef	0%	3%	3%	8%	9%
Pigmeat	0%	9%	9%	10%	10%
Poultry	0%	3%	3%	4%	4%
Crops					
Wheat	0%	0%	0%	0%	0%
Barley	0%	0%	0%	1%	1%
Maize	0%	0%	0%	1%	1%
Rapeseed	0%	-1%	-1%	-1%	-1%
Rape meal	1%	-3%	-3%	-3%	-3%

Scenario 1: Implementation of Health Check reforms
Scenario 2: Doha Round WTO reforms
Scenario 3: Full decoupling across the EU
Scenario 4: Further trade liberalisation
Scenario 5: Phasing out the Single Farm Payment with further trade liberalisation

Table A6: UK Dairy Sector Results
(Percentage difference in 2018 compared to Baseline)

	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Dairy Variables					
Milk Production	-3%	-3%	-3%	-4%	-4%
Producer Milk Price (Eng & Wales)	-2%	-3%	-3%	-4%	-3%
Dairy cows	-3%	-3%	-3%	-4%	-4%
Liquid milk cons.	0%	0%	0%	0%	0%
Manufacturing use	-3%	-4%	-4%	-5%	-5%
UK Commodity Production					
Cheese	-3%	-4%	-4%	-5%	-5%
Butter	-2%	-11%	-11%	-12%	-11%
SMP	-4%	-9%	-9%	-10%	-10%
WMP	-1%	9%	10%	7%	8%
UK Commodity Prices					
Cheese	-5%	-6%	-6%	-8%	-7%
Butter	-2%	-17%	-17%	-18%	-17%
WMP	-4%	-3%	-2%	-4%	-3%
SMP	-6%	-4%	-4%	-6%	-4%

Scenario 1: Implementation of Health Check reforms
Scenario 2: Doha Round WTO reforms
Scenario 3: Full decoupling across the EU
Scenario 4: Further trade liberalisation
Scenario 5: Phasing out the Single Farm Payment with further trade liberalisation

Table A7: UK Meat Sector Results
(Percentage difference in 2018 compared to Baseline)

	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Beef Sector					
Beef cows	-1%	-6%	-5%	-20%	-26%
Dairy cows	-3%	-3%	-3%	-4%	-4%
Beef price	-1%	-8%	-7%	-26%	-25%
Production	-1%	-4%	-3%	-9%	-12%
Domestic cons.	0%	1%	1%	8%	7%
Exports	-5%	-16%	-13%	-49%	-61%
Imports	2%	8%	7%	28%	30%
Sheep Sector					
Ewes	0%	-4%	-4%	-10%	-17%
Sheepmeat price	0%	-6%	-5%	-12%	-11%
Production	0%	-3%	-3%	-8%	-15%
Domestic cons.	0%	-1%	-1%	-1%	-1%
Exports	-1%	-11%	-8%	-34%	-64%
Imports	0%	1%	1%	3%	6%
Pig Sector					
Sows	0%	-4%	-4%	-6%	-5%
Pigmeat price	0%	-5%	-5%	-6%	-6%
Production	0%	-4%	-4%	-5%	-5%
Domestic cons.	0%	0%	0%	0%	0%
Exports	0%	-4%	-4%	-6%	-5%
Imports	0%	2%	2%	2%	2%
Poultry Sector					
Poultry price	1%	-9%	-8%	-12%	-12%
Production	0%	-1%	-1%	-2%	-2%
Domestic cons.	0%	0%	0%	0%	0%
Exports	0%	2%	2%	3%	3%
Imports	0%	6%	6%	8%	8%

Scenario 1: Implementation of Health Check reforms
Scenario 2: Doha Round WTO reforms
Scenario 3: Full decoupling across the EU
Scenario 4: Further trade liberalisation
Scenario 5: Phasing out the Single Farm Payment with further trade liberalisation

Table A8: UK Crop Sector Results
(Percentage difference in 2018 compared to Baseline)

	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Crop Sector					
Area					
Wheat	0%	0%	0%	0%	1%
Barley	0%	0%	0%	-1%	-2%
Rapeseed	0%	0%	0%	0%	-3%
Production					
Wheat	0%	0%	0%	0%	1%
Barley	0%	0%	0%	-1%	-2%
Rapeseed	0%	0%	0%	0%	-3%
Prices					
Wheat	1%	-2%	-2%	-1%	-1%
Barley	1%	-2%	-2%	-1%	-1%
Rapeseed	0%	-1%	-1%	-1%	-1%

Scenario 1: Implementation of Health Check reforms
Scenario 2: Doha Round WTO reforms
Scenario 3: Full decoupling across the EU
Scenario 4: Further trade liberalisation
Scenario 5: Phasing out the Single Farm Payment with further trade liberalisation

Table A9: UK Market Receipts and Feedstuff Costs
(Percentage difference in 2018 compared to Baseline)

	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5*
Market receipts					
Beef	-2%	-12%	-10%	-32%	-34%
Pig	0%	-9%	-9%	-11%	-11%
Sheep	0%	-9%	-8%	-19%	-25%
Poultry	1%	-10%	-9%	-14%	-13%
Total Livestock	0%	-10%	-9%	-21%	-22%
Dairy	-5%	-6%	-6%	-8%	-7%
Crops	1%	-2%	-3%	-2%	-2%
Total Market Receipts	-1%	-7%	-7%	-13%	-13%
Costs					
Feedstuffs	0%	-5%	-4%	-6%	-7%
Retained Direct Payments*	0%	0%	0%	0%	-66%
Total Market Receipts plus Retained Direct Payments	-1%	-6%	-6%	-10%	-22%

Scenario 1: Implementation of Health Check reforms
Scenario 2: Doha Round WTO reforms
Scenario 3: Full decoupling across the EU
Scenario 4: Further trade liberalisation
Scenario 5: Phasing out the Single Farm Payment with further trade liberalisation

* Retained Direct Payments defined as (SFP plus agri-environmental funds minus costs associated with agri-environmental measures).

Table A10: Scotland Dairy Sector Results
(Percentage difference in 2018 compared to Baseline)

	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Dairy Variables					
Milk Production	-2%	-2%	-2%	-3%	-3%
Dairy cows	-2%	-2%	-2%	-3%	-3%
Liquid milk cons.	0%	0%	0%	0%	0%
Manufacturing use	-4%	-4%	-4%	-5%	-6%
Producer Milk Price	-3%	-4%	-3%	-4%	-4%
Commodity Production					
Cheese	-4%	-4%	-4%	-5%	-6%
Butter	-4%	-18%	-18%	-20%	-19%
Commodity Prices					
Cheese	-5%	-6%	-6%	-8%	-7%
Butter	-2%	-17%	-17%	-18%	-17%
WMP	-4%	-3%	-2%	-4%	-3%
SMP	-6%	-4%	-4%	-6%	-4%

Scenario 1: Implementation of Health Check reforms
Scenario 2: Doha Round WTO reforms
Scenario 3: Full decoupling across the EU
Scenario 4: Further trade liberalisation
Scenario 5: Phasing out the Single Farm Payment with further trade liberalisation

Table A11: Scotland Meat Sector Results
(Percentage difference in 2018 compared to Baseline)

	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Beef Sector					
Beef cows	-1%	-5%	-4%	-17%	-26%
Dairy cows	-2%	-2%	-2%	-3%	-3%
Production	0%	-4%	-3%	-10%	-15%
Beef price	-1%	-8%	-7%	-26%	-25%
Sheep Sector					
Ewes	0%	-5%	-4%	-12%	-17%
Production	0%	-4%	-3%	-10%	-16%
Sheepmeat price	0%	-6%	-5%	-12%	-11%
Pig Sector					
Sows	0%	-4%	-4%	-5%	-5%
Production	0%	-5%	-4%	-6%	-6%
Pigmeat price	0%	-5%	-5%	-6%	-6%
Poultry Sector					
Production	0%	-2%	-2%	-2%	-2%
Poultry price	1%	-9%	-8%	-12%	-12%

Scenario 1: Implementation of Health Check reforms
Scenario 2: Doha Round WTO reforms
Scenario 3: Full decoupling across the EU
Scenario 4: Further trade liberalisation
Scenario 5: Phasing out the Single Farm Payment with further trade liberalisation

Table A12: Scotland Crop Sector Results
(Percentage difference in 2018 compared to Baseline)

	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Crop Sector					
Area					
Wheat	0%	0%	0%	0%	0%
Barley	0%	-1%	-1%	-2%	-4%
Rapeseed	0%	1%	1%	1%	1%
Oats	1%	-2%	-2%	-2%	-2%
Production					
Wheat	0%	0%	0%	0%	0%
Barley	0%	-1%	-1%	-2%	-4%
Rapeseed	0%	1%	1%	1%	1%
Oats	1%	-2%	-2%	-2%	-2%
Prices					
Wheat	1%	-2%	-2%	-1%	-1%
Barley	1%	-2%	-2%	-1%	-1%
Rapeseed	0%	-1%	-1%	-1%	-1%
Oats	1%	-2%	-2%	-1%	-2%

Scenario 1: Implementation of Health Check reforms
Scenario 2: Doha Round WTO reforms
Scenario 3: Full decoupling across the EU
Scenario 4: Further trade liberalisation
Scenario 5: Phasing out the Single Farm Payment with further trade liberalisation

Table A13: Scotland Market Receipts, Retained Direct Payments and Feedstuff Costs (Percentage difference in 2018 compared to Baseline)

	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Market receipts					
Beef	-1%	-11%	-9%	-32%	-35%
Pig	0%	-10%	-10%	-12%	-12%
Sheep	0%	-9%	-8%	-19%	-23%
Poultry	1%	-9%	-9%	-13%	-13%
Total Livestock	-1%	-10%	-9%	-25%	-28%
Dairy	-5%	-6%	-6%	-7%	-7%
Crops	1%	-2%	-2%	-3%	-4%
Total Market Receipts	-1%	-7%	-6%	-15%	-17%
Costs					
Feedstuffs	0%	-5%	-5%	-7%	-9%
Retained Direct Payments*	0%	0%	0%	0%	-67%
Total Market Receipts plus Retained Direct Payments	-1%	-6%	-5%	-12%	-27%

Scenario 1: Implementation of Health Check reforms
Scenario 2: Doha Round WTO reforms
Scenario 3: Full decoupling across the EU
Scenario 4: Further trade liberalisation
Scenario 5: Phasing out the Single Farm Payment with further trade liberalisation

* Retained Payments defined as (SFP plus agri-environmental funds minus costs associated with agri-environmental measures).