

Project number: 6653
Funding source: Teagasc

Date: November, 2018
Project dates: Jan 2015 to Dec 2017

Modelling the Irish Agriculture Sector to Medium Term and Long Term Horizons with the FAPRI-Ireland



Key external stakeholders:

Department of Agriculture, Food and the Marine, Environmental Protection Agency (EPA), Farm Organisations (IFA, ICMSA, ICOSA), Food industry representative organisations (IBEC, IDIA, MII).

Practical implications for stakeholders:

The FAPRI-Ireland aggregate sector modelling research programme builds and maintains the analytic capacity required to quantitatively evaluate the impact of policy and market developments on Irish agriculture. This analytic capacity is based on the production of an annual Baseline projection of agricultural activity, commodity supply balances and agricultural output, input and income tables. During the project this allowed for the

- Analysis of policy issues of interest to the Irish agri-food sector including Bilateral Trade negotiations including CETA and Mercosur and Food Wise 2025
- Analysis of the impact of the achievement of Food Wise 2025 targets.
- Analysis of the impact of Brexit on Irish agriculture and its sub-sectors
- Analysis of the impact of animal disease based restrictions on live cattle exports from Ireland on the Irish agricultural economy.

Main results:

The key results were

- The development of and analysis of scenarios concerning alternative development paths for the Irish agricultural sector as envisaged within the Food Wise 2025 agri-food industry development strategy.
- Analysis of the impact of Brexit on the Irish agriculture and food industries and their sub-component sectors.
- Economic analysis of the impact of potential restrictions of live cattle exports arising as a result of animal disease issues.
- Economic analysis of the impact of alternative development scenarios for the Irish agricultural sector set out in the Food Wise 2025 agri-food industry development strategy.

Opportunity / Benefit:

The analysis conducted and published supported agricultural policy making in Ireland, is a key input into the provision of projections of GHG inventories by the EPA and results of analysis are used by other researchers in related projects in Teagasc and other institutions.

Collaborating Institutions:

Food and Agricultural Policy Research Institute (FAPRI) at the University of Missouri-Columbia, USA and Agri-Food and Biosciences Institute – Northern Ireland (AFBI-NI).

Teagasc project team: Dr. Kevin Hanrahan (PI)
Mr. Trevor Donnellan

External collaborators: Prof Julian Binfield and Professor Patrick Westhoff, U. of Missouri; Dr Myles Patton (AFBI) and Dr Siyi Feng (AFBI)

1. Project background:

The policy and market context within which Irish agri-food industries operate is complex and characterised by a) a high degree of interdependence across agricultural sectors, b) the very high dependence of Irish agriculture and food industries on export markets and c) the continued importance of public policy (at Irish, EU and international levels) in influencing the market environment within which farms and agri-food businesses operate. The policy environment within which the Irish agriculture sector is embedded is also dynamic with national, supranational (EU) and wider political and policy developments affecting agriculture in Ireland.

The research undertaken in this project provided the basis for the quantitative future orientated analysis of the impact of developments in agricultural, trade and environmental policy on the Irish agri-food industry. This analytic basis was underpinned by the development on an annual basis of a Baseline - no policy change - scenario against which alternative policy scenarios can be compared.

Baseline projections generated using the FAPRI-Ireland model are also used in a partner project focused on the environmental impact of developments in Irish agricultural activity levels that provides activity level projections to the EPA and projections of Irish agriculture's GHG emissions..

Political developments during the course of the project (Brexit) as well as the development of a new agri-food industry development strategy (Food Wise 2025) have in large part determined the alternative policy scenarios analysed during this project.

The Brexit referendum in 2016 that led to the triggering by the UK government of the Article 50 procedure under which Member States exit from the EU could represents a profound change to the policy and market environment within which Irish agriculture operates. Given the dependence of Irish agriculture on exports to the UK research under this project has focused on the analysis of the potential impact of Brexit on Irish agriculture.

The project provided projections that provided insights on the alternative economic development paths that would be consistent with the achievement of the Food Wise 2025 Strategies agri-food sector development targets.

2. Questions addressed by the project:

- What is the likely impact of Brexit on the economic fortunes of the Irish agricultural sector?
- What is the likely impact of Brexit on the value of Irish agricultural and food exports?
- What is the likelihood of the Food Wise 2025 targets being achieved and what would the consequences of achieving the targets be for the Irish agri-food sector?
- What is the medium term outlook for agricultural income and associated agricultural activity levels, output and input expenditure under currently agreed agricultural and agricultural trade policies?
- What would be the economic impact of animal disease based restrictions on the Irish agricultural economy?

3. The experimental studies:

In this project a set of dynamic partial equilibrium models of Irish agriculture and the Irish agricultural economy was developed, maintained and used to conduct baseline and policy scenario analysis. These models were econometrically estimated using time series data obtained from the CSO, Eurostat, DAFM and other sources. The models are simulated in a MS Excel environment to a 15 year horizon.

The models developed and maintained cover all of the principal sub-sectors of the Irish agricultural

economy and include a model of Irish agriculture's input use and expenditure, which, when combined with the sectoral sub-models, will allow for the projection of the full economic accounts for the Irish agricultural sector. The models developed and maintained in this project will form the core tools used in the provision of future orientated economic analysis by Teagasc.

The models developed and maintained during this project were used on annual basis to develop and generate agricultural activity projections and projections of agricultural commodity supply and use balances, as well as the full set of economic accounts for Irish agriculture to a 15 years horizon.

The models were also used to assess the impact of the achievement of the Food Wise 2025 agri-food sector development strategy on Irish agriculture, to analyse the impact of animal disease based restrictions on the Irish agricultural economy, and to assess the possible economy impact of Brexit on the Irish agricultural economy and its different sub-sectors.

4. Main results:

The Food Wise 2025 agri-food sector development strategy was published in July 2016. The FAPRI Ireland model was used to project a set of six alternative agriculture sector development scenarios (Baseline plus five alternative scenarios). This scenario analysis informed the strategic environmental assessment of the development strategy and underpinned the development of the second Teagasc MACC published in June 2018.

The FAPRI-Ireland model was used to simulate the impact of possible animal disease based restrictions on live cattle exports from Ireland. The economic impact of such a development was found to negative.

The impact of Brexit on Irish agri-food exports and farm incomes was also analysed on an ongoing basis under this project and published results highlighted the vulnerability of Irish agriculture and the differing sectoral vulnerabilities based on a) dependence on the UK market, b) dependence of farm incomes on CAP direct payments, c) degree of current preferential market access to the UK (height of tariff and non-tariff barriers to trade faced by non-EU suppliers to the UK market). Of the principal sub-sectors of Irish agriculture the beef sector was found to be the most negatively affected by Brexit.

Given the current dependence of Irish agri-food sector on the UK market a Brexit outcome that involved the imposition of tariff and on-tariff barriers to EU-UK agri-food trade was found to have a very large negative impact on Irish agricultural exports to the UK.

5. Opportunity/Benefit:

The principal stakeholders for this research are policy makers in Ireland both within Government (DAFM) and other State organizations (e.g. EPA) and outside of Government, e.g. farm organisations (IFA, ICSMSA, ICOSA), agri-food industry representative bodies (IBEC, ICOS, IDIA, MII). The research is also provides inputs to related research projects in REDP and CELUP.

The research has underpinned Teagasc's forward looking evaluation of the impact of policy on the Irish agri-food sector and has supported Irish agricultural and agri-food policy formation.

6. Dissemination:

Main publications:

Donnellan, T. and K. Hanrahan (2016) "Brexit - Potential Implications for the Irish Agri-Food Sector" Teagasc National Report. Available to download <https://www.teagasc.ie/media/website/publications/2012/BrexitPaperApril13final.pdf> .

Donnellan, T., Hanrahan, K. and Thorne, F. (2016) "Brexit Update: Considering the Impact on Irish Farm Incomes". Presentation at the Teagasc Situation and Outlook Conference, RDS, November 2016. Available to download at <https://www.teagasc.ie/publications/2016/outlook-2017.php>

Donnellan, K. and Hanrahan, K. (2016) Output and employment growth in primary agriculture and the

food processing sector across the EU: Are some doing better than others? Contributed Paper 160th EAAE Seminar *Rural Jobs and the CAP*, Warsaw, Poland, December 1-2, 2016. Available to download at

<https://ageconsearch.umn.edu/record/249764/files/160th%20EAAE%20Donnellan%20Hanrahan-2.pdf>

Hanrahan, K. and Donnellan, T. (2016) "The impact of a ban on live exports on the Irish cattle sector" AESI Annual Conference, AESI Annual Conference, January 7th 2016. Teagasc College of Amenity Horticulture, National Botanic Gardens, Glasnevin Dublin 9.

Hanrahan, K. (2017) "The potential impact of Brexit on the Irish Sheep Industry and wider agricultural economy" Paper presented at the 2017 Irish Grassland Association Sheep Conference. Available to download <https://www.teagasc.ie/media/website/rural-economy/Kevin-Hanrahan-paper.pdf>

Hanrahan, K., Donnellan, T. and Thorne, F. (2017) "BREXIT: Possible impacts on the Irish Beef Industry." Paper presented at the Teagasc National Beef Conference 2017 *Planning for Healthy Profits*, Tullamore 17 October 2017. Available to download

<https://www.teagasc.ie/media/website/rural-economy/rural-economy/Beef-conference-Brexit-Update.pdf>

Donnellan, T., Hanrahan, K and Lanigan, G. (2018) "Future Scenarios for Irish Agriculture: Implications for Greenhouse Gas and Ammonia Emissions." Available to download <https://www.teagasc.ie/media/website/publications/2018/GHGscenarios2030final.pdf>

Popular publications:

Thorne, F., Dillon, E., Donnellan, T. and Hanrahan, K. (2018) Brace for Brexit: What is the potential impact of a 'hard' Brexit on Irish farm level income and economic viability? TRResearch, Summer 2017.

<https://www.teagasc.ie/media/website/publications/2017/16-Brace-for-Brexit.pdf>

Lanigan, G., Donnellan, T. and Hanrahan, K. (2018) Return of the MACC. TRResearch, Autumn 2018.

<https://www.teagasc.ie/media/website/publications/2018/11-Return-of-the-MACC.pdf>

7. Compiled by: Kevin Hanrahan
