Agricultural Economics Society of Ireland
AESI

Annual Conference 2011

Thursday, November 24th

Conference Centre,
Teagasc Food Research Centre,
Ashtown,
Dublin 15.

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Thursday November 24th – AESI Conference 2011 – Morning

09.00		**Registration Tea/Coffee**		
09.15		**Contributed Paper Session 1 (2 parallel sessions)**		
Food Economics & Marketing	**Room 1**	Chair: Alan Collins	Who do you trust about nanotechnology? An application of the best-worst scaling technique.	S. Erdem
			Towards a better understanding of consumers' sensory preferences: the value of attitudinal research instruments.	D. Sorenson & M. Henchion
			How accepting are Irish consumers of new food technologies?	E.J. Dillon, M. Henchion, S. McCarthy, G.Greehy, M. McCarthy & G. Williams
			Food choice attitudes and motives of cheese consumers.	S. McCarthy, M. McCarthy, L. McKeown, J. Walton & A. Flynn
Production Economics	**Room 2**	Chair: Paul Kelly	The associations of management and demographic factors with technical, allocative and economic efficiency of Irish dairy farms.	E. Kelly, L. Shalloo, U. Geary, A. Kinsella, F. Thorne & M. Wallace
			Estimating the elasticity of demand and the production response for nitrogen fertiliser.	J. Breen, D. Clancy, T. Donnellan & K. Hanrahan
			Is the Irish model of dairy farming economically sustainable?	T. Donnellan, T. Hennessy, M. Keane & F. Thorne
10.50		**Tea/Coffee Break**		
11.10	**Room 1**	Chair: David Stead	**Plenary Session 1: Agricultural Policy Discussion Paper: The next CAP reform post-2013 - implications for Ireland**	**Prof. A. Matthews (TCD)**
11.50		**Contributed Paper Session 2 (2 parallel sessions)**		
Natural Resource Economics	**Room 1**	Chair: Trevor Donnellan	The role of the marine sector in the Irish national economy: an input-output analysis.	K. Morrissey and C. O'Donoghue
			The geography of latent classes: the role of distance decay.	D. Campbell, S. Hynes, C. Buckley, E. Doherty and D. Norton
			The merit order effect of wind generation in the Irish electricity market.	A. O'Mahony and E. Denny
Farm Households	**Room 2**	Chair: Michael Wallace	Determinants of off-farm labour supply among farm households: The role of perceptions regarding the non-pecuniary benefits from farming.	P. Howley & E.J. Dillon
			The distributive impact of the economic recession on farm households in Ireland.	C. O'Donoghue
			Measuring the impact of trade policy reform in Ireland: a disaggregated analysis of household impacts.	C. Miller, O. Boysen, A. Matthews, T. Donnellan & C. O'Donoghue
13.00		**Lunch**		

Thursday November 24th – AESI Conference 2011 – Afternoon

13.50		**Contributed Paper Session 3 (3 parallel sessions)**		
Rural Development	**Room 1**	Chair: Karyn Morrissey	To plant or not to plant? How farmers make decisions on afforestation.	S. Duesberg, A. Ni Dhubhain and D. O'Connor
			Rural households' experience of access to public services in Northern Ireland.	N. Connolly, C. Jack and D. Anderson
			Social farming in Ireland: bridging the gap – from a community of practice to a boundary organisation.	A. McGloin, D. O'Connor and J. Kinsella
Agricultural Policy & Prices	**Room 2**	Chair: Kevin Hanrahan	A review of farm structure and agriculture policy in Canada and comparisons to the EU.	W. J. Brown
			Agricultural policy in hot, dry summers: lessons from a case study of Ireland in 1976.	D. R. Stead
			Managing volatility and risk to enhance cashflows through the agribusiness supply chain – a practitioner's perspective.	D. Stack
Innovation & Agribusiness	**Room 3**	Chair: Danny Campbell	Problem solving innovation systems and the Irish dairy sector.	K. Heanue
			Milk transport options for an expanded dairy industry post milk quota removal in 2015.	C. Quinlan, L. Shalloo, M. Keane and D. O'Connor
			Innovation in the food sector: the good, the bad and the difference.	M. Henchion, G. Kavanagh, G. Williams & M. McCarthy
15.00		**Tea/Coffee Break**		
15.20	**Room 1**	Chair: Fiona Thorne	**Plenary Session 2: Sustainability from Farm to Fork** **Wilfrid Legg (formerly OECD)** **"Green Growth – the new paradigm for agriculture?"** **&** **Prof. Anna Davies (TCD)** **"Kitchen stories: imagining eating practices in 2050"** **(followed by general discussion)**	
17.00		**Close**		

Contributed Paper Session 1

Food Economics & Marketing

09.15 – 10.50

Room 1

Chair: Alan Collins

Who do you trust about nanotechnology?

An application of the best-worst scaling technique

Seda Erdem

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As a consequence of recent food safety incidents, European consumers' trust in food safety management and regulation has diminished. Food scares and food safety incidents like BSE, bird flu, and genetically modified foods, have received wide media attention, which in turn has focused the public attention on the regulatory system for food safety in general. The uncertainty regarding the safety of foods that people consume (i.e., credence nature) has created doubts in consumers' minds. This has led to mistrust in the organisations and people involved in food production.

Trust has been influenced by various factors. Some of the factors influencing the level of trust that people have in others in the food chain are: different dimensions of risks (e.g., novelty, uncertainty, controllability, and worry), what people know about these risks, and how they perceive them. Furthermore, different food safety issues feature different dimensions and levels of consumer trust. For example, food poisoning outbreaks, such as *E. coli* and Salmonella, raise awareness on hygiene practices, whereas new technologies, such as genetic modification, irradiation, and nanotechnology in food production, raise issues ranging from environmental damage to direct impacts on human health. The trust people have in others regarding such food issues will be expected to differ.

Communication may be extremely relevant to preserve and generate trust among consumers in food chain management and food safety regulation. Most research to date has focused on information per se, and several studies have stressed that such information should be informed by consumer food-risk perceptions, concerns, information needs, and preference, rather than on technical assessments alone. In contrast, there is a paucity of research on how consumers perceive the communication as such.

This study examines a key component of food safety risk communication: trust in the information source. It investigates British consumers' levels of trust in different sources of information regarding the use of a novel technology – namely, nanotechnology – in food production. Specifically, the research investigates consumers' trust in agents and organisations in the British food industry, and their role in providing balanced and accurate information about nanotechnology and its use in food production and packaging. Giving the contentious history of recent food-related technologies, e.g., genetic modification and irradiation, it is crucial to address whom consumers trust the most and the least regarding said information about nanotechnology and its implementation. Such information may help to explain the public's attitude towards accepting the technology, which may then affect its adoption in the industry.

This research also shows how the use of a novel Conjoint technique, the Best-Worst Scaling and Latent Class modelling of survey data, can provide in-depth information on consumer categories, which are useful for the design of effective public policy. This in turn would allow the development of best practice in risk communication for novel technologies. The Best-Worst Scaling technique is particularly useful because of the set of items (i.e., institutions) that respondents are required to rank, although there is evidence that people struggle to rank long lists. Results show the existence of heterogeneity in British consumers' preferences and the level of trust in information sources concerning nanotechnology. Three distinct consumer segments are identified: Class-1, who trust "government institutions and scientists" the most; Class-2, who trust "non-profit organisations and environmental groups" the most; and Class-3, who trust "food handlers, producers, media, and friends" the most.

Keywords: Best-Worst Scaling; Latent Class modelling; Trust; Nanotechnology; UK.

Towards a better understanding of consumers' sensory preferences: the value of attitudinal research instruments

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Abstract

High pressure processing (HPP) is a novel non-thermal processing technology that involves the application of hydrostatic pressure to inactivate micro-organisms and extend the shelf life of foods with minimal affects on nutritional and sensory quality. The primary focus of this research was to determine whether HPP could also improve the eating quality of a chilled ready meal manufactured using a low-value beef cut. Three hundred consumers evaluated chilled ready meals subjected to 4 pressure treatments and a non-treated control monadically on a 9-point scale for liking for beef tenderness and juiciness, overall flavour, overall liking, and purchase intent. Data were also collected on consumers' food consumption patterns, their attitudes towards food by means of the reduced food-related lifestyle (FRL) instrument, and socio-demographics.

The findings from this study showed the potential of HPP to improve the eating quality of chilled ready meals manufactured using a low-value beef cut. The overall result from the 300 consumer acceptance test indicated that a pressure treatment of 200MPa was most acceptable to the majority of consumers. However, an increase in pressure above 200MPa did not always elicit lower acceptance scores, and 4 consumer groups were identified with differing perceptions of eating quality and different thresholds of acceptability for the 5 treatments. Importantly, this study found that behavioural and attitudinal factors rather than socio-demographic factors significantly influenced sensory liking and acceptability, and helped explain cluster membership. The segments most accepting of pressure treatments at and above 400MPa were more likely to be either convenience-driven (Cluster 2) or uninvolved (Cluster 3) with regard to the food purchase decision-making process. This study illustrates how the integration of marketing and sensory research techniques can provide for a better understanding of consumers' preferences, their perceptions of quality, and the requirements of the marketplace in terms of product offerings. This unitary approach to new product development (NPD) can assist firms more accurately identify and target cognitively and attitudinally differentiated market segments, in order to leverage a superior competitive advantage in the marketplace.

Keywords: Consumer acceptance; High pressure processing; Chilled ready meals; Food-related lifestyles

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How accepting are Irish consumers of novel food technologies?

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Introduction

Novel food technologies (NFTs) are constantly being developed by industry to improve food production and processing and to satisfy consumers' diverse demands. Indeed, Food Harvest 2020 underlines the importance of their adoption in delivering a sustainable agri-food economy. Research on consumer acceptance of NFTs is needed in advance of significant investment by industry. As part of a wider research project examining consumer acceptance of eight NFTs, for illustrative purposes, this abstract focuses on two such technologies; (i) functional foods (the addition of beneficial functional ingredients to food products) and (ii) an *in vitro* meat production system (IMPS) (culturing muscle tissue in a liquid medium on a large scale). There is both a qualitative and quantitative component to this research, with the qualitative work helping to inform the design of a nationally representative survey examining consumer acceptance of nanotechnology in food and food packaging (*n = 1,000*).

Methodology

A qualitative approach was taken providing depth rather than breadth in terms of examining consumers' attitudes. A novel methodology was applied involving observations of a one-to-one deliberative discourse (conversation) between two food scientists and consumers. The primary objective of which was to understand the evolving perspective of the individual consumer with regard to the technology (i.e. perceived benefits and potential concerns) as information was presented. The scientists presented a number of pre-defined hypothetical scenarios, illustrating some benefits and risks from a consumer, societal, environmental and industry perspective of different applications of the technology in question. Furthermore, in depth pre and post-discourse interviews were undertaken with participants (*n = 10; 30 observations in total*) to determine the perceived influence of the discourse on acceptance and the factors contributing to any attitudinal change. Thematic analysis was then undertaken.

Results

Consumers were more accepting of these two technologies if they perceived them to have associated personal and societal benefits. In the case of functional foods, perceived health benefits were important, whilst acceptance of *in-vitro* meat was positively influenced by an improvement in animal welfare and the nutritional value of meat products. The issue of unnaturalness and interference with the food chain was a perceived risk common to both technologies; this appeared to outweigh any perceived benefits. Interestingly, participants reacted more favourably towards in-vitro chicken than beef on welfare grounds.

Conclusions

This qualitative work has helped to gain insights into consumer acceptance of a range of NFTs, with some common themes emerging. Individual perspectives and values framed overall attitudes towards NFTs. generally. As more innovative technologies emerge, additional issues with regard to acceptance arise, underlining the importance of continued dialogue with consumers. The quantitative component of the research employs a conjoint analysis methodology to examine consumer acceptance of nanotechnology in food and food packaging, which should prove useful in developing the trajectory for other NFTs.

Keywords: *Deliberative Discourse, Consumer Acceptance, Functional Foods, In-Vitro Meat, Nanotechnology.*

Acknowledgements

This FIRM (Food Institutional Research Measure) project is funded through the Department of Agriculture, Food and the Marine under the National Development Plan 2007-2013.

Food choice attitudes and motives of cheese consumers

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Introduction

Understanding food choices is problematic due to the complex interplay between the individual, environment and products. Thus, establishing the extent to which various motives frame specific food choices is of value. In the case of cheese, insights into the impacts of food choice attitudes and motives on consumption patterns could aid in the development of existing and new markets.

Methodology

The recently completed representative National Adult Nutrition Survey (n=1500; 18-90years) collected data on Irish consumers food choice motives and attitudes and food consumption patterns (4 day food diary). Pearson correlations were used to measure the linear association between consumers' cheese consumption levels and their food choice attitudes and motives.

Results

Cheese consumers accounted for 65% of the population with a mean daily intake of 21g (std. dev =18). There was no significant difference in cheese consumption across age groups. Mean daily intake of cheese was correlated with 20 different attitudinal and motive constructs. Significant correlations were identified for five of the constructs. Mood ($P=0.013$) was negatively correlated with cheese consumption. This suggests that cheese may not be viewed as a mood enhancing product. Furthermore, where greater importance is placed on sensory motives lower consumption levels were observed ($P=0.046$). This may be as a result of 'sensory driven' consumers seeking greater variety across products and thus consuming less in any particular food domain. Good cooking skills ($P=0.013$) good intention to eat a healthy diet ($P<0.001$) as well as choosing smaller portion sizes ($P<0.001$) were also significantly negatively correlated with cheese consumption, indicating that cheese may not be an obvious healthy choice for consumers.

Conclusions

Although these analyses indicate that food choice motives do not distinguish well for the cheese product category, certain recommendations can be made. Marketing opportunities exist to promote the sensory, feel good and health aspects of cheese.

Key Words
Cheese, food choice motives, food surveys, food marketing

Acknowledgements
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Contributed Paper Session 1

Production Economics

09.15 – 10.50

Room 2

Chair: Paul Kelly

The associations of management and demographic factors with technical, allocative and economic efficiency of Irish dairy farms

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1 SUMMARY

The phasing out of the European Union (EU) milk quota will create opportunities for producers to expand without the constraint of quota which has limited expansion since 1984. Therefore it will be necessary for Irish dairy producers to become more competitive by increasing performance using the least amount of inputs per unit of output and maximizing the level of technical and economic efficiency. The objectives of this study were to measure technical, allocative and economic efficiency and to investigate the associations of key management, qualitative and demographic characteristics on efficiency. Efficiency scores were calculated using the non parametric methodology Data Envelopment Analysis (DEA). The DEA results showed that on average the sample of Irish dairy producers were not fully efficient in 2008 with technical, allocative and economic efficiency results under variable returns to scale (VRS) of 0.771, 0.740 and 0.571 respectively. In a second stage analysis Tobit regressions were used to determine the associations of key variables with the technical, allocative and economic efficiency scores. The efficiency scores were included as dependent variables and the key independent variables were a variety of management and demographic variables. Mean calving date, number of grazing days, breeding season length, milk quality, discussion group membership and soil quality were all associated with technical and economic efficiency. Milk recording, AI use and level of dairy specialisation were associated with allocative and economic efficiency only. Age and age squared were the only significant demographic association with the efficiency scores.

Keywords: economic efficiency, data envelopment analysis, dairy production, Ireland.

Estimating the Elasticity of Demand and the Production Response for Nitrogen Fertiliser

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The application of artificial fertiliser continues to be a vital component of the production system on the bulk of Irish farms, accounting for approximately nine percent of total costs on dairy and cattle farms (Hennessy et al. 2011). However, the average application of artificial nitrogen fertiliser on grassland has been in decline recently. This reduction in use is likely due to a number of factors including better on-farm grassland management, as well as better management and utilisation of organic manures, the introduction of the Rural Environmental Protection Scheme, the Nitrates Directive, and more recently higher fertiliser prices. Changes in artificial nitrogen use levels are likely to have significant implications for agricultural productivity as well as environmental implications, both in terms of nitrate emissions and greenhouse gas emissions. Therefore, a better understanding of the factors affecting fertiliser demand, as well as the relationship between fertiliser use and agricultural production levels is required.

Previous attempts to estimate demand elasticities for fertiliser in Ireland include Higgins (1986) who used data from the 1982 National Farm Survey to estimate elasticities for fertiliser as well as three agricultural outputs and eight other inputs. Both, O'Rourke and McStay (1978) and Boyle (1982) used aggregate data to estimate elasticities of demand for fertiliser. Finally, Higgins (1986) noted that the use of panel data would allow for the inclusion of price expectations and risk in the analysis.

In this study an unbalanced panel dataset was constructed using data from the NFS (2003 to 2010) and used to estimate two fixed effects models. The first model estimated the elasticity of demand for artificial fertiliser applied on grassland. The aim of this work was to ascertain the responsiveness of fertiliser demand to changes in fertiliser price. A second fixed effects model was developed to estimate the relationship between stocking rate and the level of artificial nitrogen applied on grassland. The fertiliser demand model can be specified as follows:

$$A_{it} = \alpha + u_i + \beta_1 x_{it1} + \beta_2 x_{it2} \ldots\ldots \beta_k x_{itk} + e_{it}$$

where A_{it} is the demand for fertiliser per farm i in year t (t = 1,…, 9), α is the regression cross-sample constant term, u_i is the farm specific constant term (fixed effect), $x_{it1\text{-}k}$ are the explanatory variables.

This will allow us to determine the relationship between fertiliser price and fertiliser demand as well as the potential impact of changes in nitrogen fertiliser use on stocking rate.

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Is the Irish Model of Dairy Farming Economically Sustainable?

Trevor Donnellan[1], Thia Hennessy[1], Michael Keane[2] and Fiona Thorne[1]

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This paper examines the competitiveness of the Irish milk sector at farm level compared to that of a number of EU- and non-EU countries. The analysis was based on two main data sources – the Farm Accountancy Data Network (FADN) from the European Commission for years 1996-2010 and the International Farm Comparisons Network (IFCN) for the years 2004-2010.

Understanding the different measures of costs is vital in assessing competitiveness. While it is possible to focus on the cash costs of production, the wider definition of economic costs also includes an estimated value for own land, family labour and non-land assets. To measure competitiveness, costs can be expressed relative to output value, per unit of product or per hectare.

Using the cost relative to output value approach, on a cash costs basis, Ireland is quite competitive in the EU15. Cash costs as a percent of output were relatively low in Ireland over the period 1996-2010. When full economic costs were considered however the competitive position of the selected countries changes. The competitive advantage experienced by Irish producers deteriorates when all imputed charges for owned resources are taken into consideration. However, when total economic costs were considered as a percentage of output for larger specialist dairy farms with 50-99 dairy cows, total economic costs for this sample of farms were generally substantially lower then the average farm position. For example in Ireland, total economic costs as a percentage of output was reduced by just over 20 percent, when the larger size farm was compared to the average size farm. While Ireland still remained as a comparatively high total economic cost producer for farms with 50-99 dairy cows, the gap with other countries was narrowed for these larger specialist producers.

Given that the EU's competitors have increased their share of global dairy trade in recent times and with the elimination of the EU milk quota now imminent, the current competitive position of the Irish dairy sector in a global context requires consideration. Compared with key competitor non-EU15 dairy producing regions, the analysis of cash costs per unit of product and relative to output value confirms the strong competitive position of the larger size Irish dairy farm in a global context, in addition to the favourable position previously identified within the EU15. The competitive position of the Irish dairy sector beyond the EU15 deteriorates very substantially for the smaller size Irish dairy farm when total economic costs are considered. Typical farms in Argentina and New Zealand appear to consistently exhibit the lowest total economic costs per unit of milk produced.

In conclusion, this study has found that the competitive position of the Irish dairy sector at farm level remains favourable is cash costs terms. However, when full economic costs are considered the competitive position of the average size Irish dairy farm is likely to become an increasing cause for concern. However, the removal of milk quotas may lead to increased Irish milk production, as well as creating greater opportunities to increase farm size and the scale of processing facilities, all of which may improve the competitive position of the Irish dairy sector.

Plenary Session 1: Agricultural Policy

The next CAP reform post-2013 – implications for Ireland

Prof. Alan Matthews (Trinity College Dublin)

11.10 – 11.50

Room 1

Chair: David Stead

Discussion Paper: The Next CAP Reform post-2013: Implications for Ireland

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Keywords: CAP, reform, direct payments, rural development, Ireland

The Commission's legislative proposals for the four Regulations to amend the existing CAP regulations on direct payments, rural development, common market organisations and horizontal issues are expected to be published on 12th October next and will thus be widely known by the time of the conference. A leaked version of the proposals is now available for scrutiny. The purpose of this paper is to provide an opportunity for discussion of these proposals from an Irish perspective.

The legislative proposals are built on the Commission's proposal for the next medium-term financial framework 2014-2020 which sets out the budget proposed for Pillars 1 and 2 of the CAP. Although the Commission's proposals broadly maintain CAP spending in nominal terms, a strong coalition of Member States is arguing for cuts in the Commission's spending proposals, although without agreement where these cuts might fall.

Under the direct payments heading, the regulation will propose greater convergence of payments both across and within Member States. The current system of entitlements to the Single Farm Payment will be ended and a new system of entitlements to a basic payment introduced. In addition, farmers will be eligible for other direct payments including a green payment, less favoured area payment and payments for new entrants. The retention of coupled payments up to 5% of a Member State's national ceiling is proposed, with the possibility of exceeding this proportion under specified conditions with the agreement of the Commission. The payments will be more targeted and confined to active farmers with capping of payments to larger farms. Some flexibility to transfer direct payment entitlements to rural development measures (up to 5% of the total) is proposed.

Under the rural development regulation, greater coordination of EAFRD rural development spending with other structural funds under a Common Strategic Framework is proposed. The rural development axes which limit Member State discretion on how to allocate their RD funds will be eliminated, and will be replaced by six priorities. The programming cycle for RD measures is retained, and a small share of the funds (5%) will be held back until 2019 to be reallocated on the basis of performance criteria. Innovation will be encouraged through a new European Innovation Partnership programme. An enhanced risk management toolkit is introduced. The criteria for distributing RD funds across Member States will be based on objective criteria linked to the three objectives of the funds, but taking into account past performance.

There are few changes in the market organisation regulation. The end of sugar quotas is signalled. The scope for measures to address market disturbance is enhanced (including the creation of a new Special Reserve outside the MFF ceiling to address market crises). The proposals already made to strengthen the position of milk producers in the dairy supply chain and to strengthen the role of marketing standards in the context of the quality package are included.

These proposals now enter the legislative process to be jointly agreed by the Council and European Parliament, and much may change by the time final agreement is reached.

A number of important issues are raised for Irish agriculture:

- How will production be affected by the proposal to move towards uniform payment entitlements?
- Does it make sense to retain entitlements in the management of direct payments?

- Will the proposals really help to ensure the provision of valued public goods in the Irish context?
- Should we take advantage of the flexibility to 'modulate' some of the direct payments ceiling in favour of rural development spending?
- Do the Commission's proposals on voluntary coupling pose a threat to the level playing field for Irish producers?
- Is there sufficient focus on helping agriculture and the food industry to adapt to the challenges of climate change in Pillar 2?
- Should Ireland make use of the enhanced risk management toolkit?

The paper will comment briefly on these issues in order to introduce the discussion.

Contributed Paper Session 2

Natural Resource Economics

11.50 – 13.00

Room 1

Chair: Trevor Donnellan

The Role of the Marine Sector in the Irish National Economy:

An Input-Output Analysis

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Abstract

The realisation that the world's oceans play an important role in climate regulation and many territory activities, notably food production, coupled with economic changes and the rapid advancement in ocean technology have seen a shift in the perception of the importance of marine resources. This increased focus on marine resources means that governments and policy-makers require accessible and reliable information regarding the role of the marine sector. This information may then be used to formulate new environmental and economic policy measures. Ireland's ocean resource consists of 900,000km^2 of seabed and 1448km of coastline. Economically, Ireland depends heavily upon its maritime transportation sector with 95% of the value and 99% of its trade transported by sea. To date, little emphasis has been placed on the development of the marine sector in Ireland. However, recent research using a multi-sectoral definition of the Irish marine economy found that in 2007, the Irish marine sector provided €1.44 billion in direct Gross Value Added (GVA) to the Irish economy and employed approximately 17,000. However, economic activity in the marine sector not only directly affects the industries in the sector but also influence other sectors through intersectoral input-output linkages. This paper uses the Input-Output methodology to examine both backward and forward linkages of the Irish marine sector on the national economy, thus, providing both the direct and indirect value of the Irish marine sector in 2007.

The geography of latent classes: the role of distance decay

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Edel Doherty[1] and Danny Norton[2]

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Summary

While stated choice experiments provide useful insight for many stakeholders, the models, on which the results are derived, typically do not adequately account for the inherent spatial dimension that is likely to exist. This is in spite of the fact that it is well recognised within the non-market literature that there is generally a negative relationship between the value people attach to an environmental resource and the distance they live from it. This is widely referred to as the 'distance decay' effect.

Using responses to a stated choice experiment that aimed at establishing willingness to pay for a number of rare and endangered fish species in the Lough Melvin Catchment, this paper sets out to explore whether the distance that respondents lived from the Catchment had any bearing on the willingness to pay estimates. We begin our analysis using a novel 'distance decay willing to pay space' specification, whereby we estimate a distance decay function for each of the fish species. We then build upon this model to accommodate the 'aspatial' heterogeneity that exists in the willingness to pay estimates.

Notwithstanding the advantages that these models are shown to possess over the naïve specifications, that do not account for the distance decay, they are based on a stringent deterministic relationship between willingness to pay and distance. For this reason, we develop a more flexible latent class logit model that is capable of 'probabilistically' describing the spatial patterns and variations in the willingness to pay estimates. Specifically, we define the latent class membership to be a function of distance. Subsequently, we are able to derive weighted willingness to pay estimates across the complete spatial extent.

In this paper we discuss the importance of accounting for the spatial heterogeneity (attributable to the effect of distance decay) in willingness to pay and the additional insight that these more flexible models offer. We also address the implications for policy appraisal.

Keywords: Latent class model; Distance decay; Discrete choice; Existence value; Willingness to pay.

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The merit order effect of wind generation in the Irish electricity market

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Overview

As energy consumption has risen steadily over the past century, so too have emissions, resulting in climate change. This, alongside dwindling fossil fuel resources has resulted in increasing global interest in renewable generation, which allows for lower carbon emissions from electricity generation and contributes to policy targets such as the Kyoto Protocol (1992), US cap and trade programs such as the Clean Air Act (2008) and the Regional Greenhouse Gas Initiative (2007) and the EU emissions trading scheme (European Commission 2009). A key challenge internationally is the design of future electricity systems which will bring about emissions savings and fuel security at least cost. Due to the recent crisis in Japan, many nuclear programs have been put on hold, with other nations undergoing re-examination of their nuclear facilities post Fukushima (Schneider et al. 2011). This will have implications for renewable energy resources, as they are considered an even more favourable source of electricity generation. Of the renewable technologies currently available for electricity generation, wind is one of the most developed and as a result is gaining significant market shares internationally. This has resulted in greater focus on the impact of wind on the electricity system, as until quite recently no system had faced the challenges associated with high penetrations of wind – namely the need for greater flexibility and reserve due to the increase in volatility (NREL 2011; NERC 2008)

Wind generation affects the intersection of the merit order with the demand curve; as can be seen in Figure 1 it essentially shifts the demand curve to the left as it can be considered as the demand for electricity less the amount of wind generated, resulting in the demand for conventional supply. Wind can be considered as negative demand due to its zero marginal cost. This is because once the supply curve is defined and it is compared to demand, the System Marginal Price is set to the bid price of the most expensive plant required to meet demand (Devitt et al. 2008). This is known as the Merit Order Effect (MOE), which arises from the fact that, all else equal, adding wind power to the system should replace higher marginal cost plant on the system, and this in turn is likely to lower wholesale electricity prices (Indecon 2008; Felder 2011).

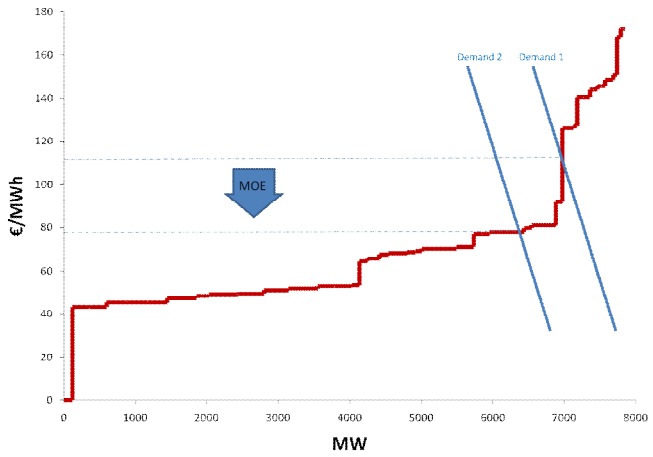

Figure 1 Merit Order Effect

Methods

The All Island Grid Study (2008) found that "at higher proportions of renewable capacity installed, less conventional capacity is required to run and thus the operational cost decreases". This is in line with various studies to date, which have shown that increased wind power in the generation mix will in fact lead to reductions in the Spot Market Price (Moesgaard and Morthorst 2008; Pöyry 2010; Sensfuß et al. 2008). However these have largely involved simulated wind production and prices as opposed to historical data. Results from Moesgaard and Morthorst (2008) show that wind power benefits the

consumer through economic as well as environmental benefits, and that the price reducing effect could be higher than the studies estimate, while Sensfuß et al. (2008) point out that the cost for renewable support paid by consumers is not as high as is generally expected when the MOE is taken into account.

This paper aims to identify the MOE of wind on the Irish system in 2009 through the use of inverse supply multiple regression analysis, as shown in Equation 1.

$$ShadowPrice_t = \alpha + \beta_1 NetDemandk_t + \beta_2 NetDemandk_t^2 + \beta_3 Wind + \beta_4 Wind^2 + \beta_5 MarCap_t + \beta_6 Gas_{t-24} + \beta_7 Oil_{t-24} + \beta_8 Coal_{t-24} + \beta_9 Carbon_{t-24} + \varepsilon_t$$

Once the average hourly effect has been calculated, we can estimate the cost of electricity over the course of the year had no wind been available. Wind generation typically receives a subsidy in order to compensate it for its positive external benefits, which include the reduction in fossil fuel consumption for electricity generation, environmental benefits and the meeting of national and international policy targets. We endeavour to quantify these positive externalities. This will then be compared to the subsidy for wind generated electricity over this time period and the cost of carbon in order to observe whether the financial benefits of wind outweigh the costs and could therefore be cost effective without the current subsidies received.

Results

In this study we generate an inverse supply time series multiple regression model. Controls are included for each hour of the day; day of the week; month and public holidays, as all of these have an effect on the demand for electricity; the availability of wind for generation; and the scheduled maintenance of conventional plant which has an effect on the fuel mix.

The results show that the value of wind to the market dispatch has resulted in savings of €141 million in 2009. As expected, the greatest saving to the market coincides with both peak demand and prices, as wind generation at 7pm represents the greatest saving along the merit curve. The value of wind is directly related to the units which it displaces, which is why the value of -0.0189 seen at 7pm is more than double the coefficient seen at 7am (-0.0046). Ireland's highest daily levels of wind coincide with peak demand, resulting in a significant saving; countries that experience highest wind levels during the night, or periods of low demand may not see the same level of cost savings.

Conclusions

Overall, the value of wind to the market dispatch is calculated to have resulted in savings of €141 million to the market dispatch in 2009. This calculation is made by multiplying the hourly coefficients by the historical wind outputs and system demand at each hour in order to calculate the total saving at each hour of the day which is attributable to wind.

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Contributed Paper Session 2

Farm Households

11.50 – 13.00

Room 2

Chair: Michael Wallace

Determinants of off-farm labour supply among farm households: The role of perceptions regarding the non-pecuniary benefits from farming.

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Introduction
Although farmers tend to be tied to the land and as such their employment opportunities subject to geographical constraints, off-farm work is a persistent and growing phenomenon in most industrialized countries (Phimister and Roberts, 2006). Farmers often choose to supplement low farm income with off-farm earnings rather than exit the sector and as such off-farm work in rural areas is important because of its role in ameliorating the effects of relatively low agricultural incomes (Kimihi and Nachlieli, 2001). Given the increased incidence of off-farm employment and the importance of off-farm income to farm households it will be important to understand the factors that affect the supply of off farm labour. As noted by Huffman (1998), as agriculture continues to adjust to new farm and trade policies as well as new technologies a better understanding of the economics of time allocation will hold important implications for the well being of farm people. Furthermore, farmers' responsiveness to local labour market conditions and how that responsiveness changes as demographic factors (e.g., age, education, family structure) change will affect the design and effectiveness of government programs (Howard and Swidinsky, 2000).

The objective of this paper is to provide new econometric evidence relating to the supply of off-farm labour by farm operators in rural households in Ireland. A double hurdle model is formulated to examine the off-farm labour supply decisions of farm households as it allows the joint modelling of (i) the decision whether or not to participate in the labour market; and (ii) the amount of time the participant allocates to off-farm work. Specifically, using a custom designed nationally representative survey, this paper examines the role of personal characteristics of the farm operator, household factors and structural farm characteristics on the off-farm labour market decisions of farm operators. Furthermore, it adds a novel contribution to existing work by specifically examining the role of perceptions regarding the non-pecuniary benefits associated with farm relative to non-farm work on labour allocation decisions.

Research Design
The data utilized in this study comes from a nationally representative survey of 607 farmers conducted over 12 weeks between August and October 2011. A quota controlled sampling procedure was followed to ensure that the survey was nationally representative for the population aged 15 years and above. In relation to employment status, survey respondents were asked to indicate if they had an off-farm job. Those that indicated that they had an alternative source of employment were then given various categories in 10 hour intervals ranging from less than 10 to over 50. As such the variable representing labour supply took the form of a categorical interval variable which was right censored at over 50 hours. Farmers' perceptions regarding the non-pecuniary benefits of farming relative to non farm work were captured by including a number of attitudinal statements in the questionnaire. Survey respondents were asked to indicate how much they agreed or disagreed with each statement on a scale from 1 to 10 with 1 being completely disagree and 10 being completely agree. The factor scores resulting from the analysis of the attitudinal statements measure the degree to which respondents feel that there are a variety of non-economic benefits from farming

not observable in other employment. The individual factors scores were used as explanatory variables to examine their impact on the labour allocation decisions of farm operators. The results from the factor analysis of the multiple value items designed to capture perceptions regarding the non-economic benefits associated with the farming experience along with their overall mean scores are presented in table 1.

Results

The results of the logit model examining factors affecting off farm labour market participation can be seen in table 2 with the results of the labour supply model following in table 3. Results indicate that personal characteristics of the farm operator such as age and education as well as characteristics of the household such as the presence of children and whether the spouse has an off-farm job affect labour market participation. Farm structural factors such as stocking rate, farm size and farm system (i.e. dairying) also significantly affect the probability of farmers engaging in non-farm work. Farmers who had diversified were more likely to participate in off-farm employment but once that decision was made were, all things being equal, less likely to supply hours to off farm employment. The level of perceived debt on farms did not have a statistically significant impact on the labour allocation decisions of principal farm operators. Finally the derived variable 'farming value' was also found to effect labour market participation. In terms of labour supply, while some variables were not statistically significant the only variable that was found to have a different statistically significant effect in not only magnitude but also direction was whether a farmer had diversified the farm business.

Discussion

The results stemming from the labour participation and labour supply models illustrate the impact of a wide range of factors on the labour allocation decisions of farm operators. As expected older farm operators are less likely to participate in the off-farm labour market. This is in keeping with the life cycle earnings hypothesis which suggests that young farmers are generally more willing to do non farm work to finance additional asserts, whereas older farmers may have sufficient income from other sources (Lim-Applegate et al., 2002). Education was positively related with labour participation and supply which would suggest that, for this sample of farmers at least, the increase in the marginal returns from education is greater for off-farm rather than non-farm work. Farm operators with spouses with an off-farm job or income are also more likely to participate in off-farm employment. It could be that having a spouse with alternative income from outside the farm may be indicative of a family receptive to opportunities outside of agriculture (Howard and Swidinsky, 2000). The presence of children was also found to have a positive effect on the probability of a farmer participating in the off-farm labour market. It seems reasonable to hypothesise that households with children would have tighter budget constraints and be under relatively more pressure to obtain extra income from outside the farm.

Dairy farmers were less likely to engage in off farm work and those that do were also likely to work less hours than other farm types which would be in line with previous research (Hennessy and Rehman, 2008; Lim-Applegate et al., 2002). Dairy farming requires the presence of a farmer at certain times of the day and therefore they do not have a lot of flexibility with their time. In addition, the marginal productivity of dairy farmers is generally higher that that observed on other farm types. The final farm structural variable examined was farm size which was also found to be negatively associated with the probability of the principal farm operator engaging in off-farm work. This perhaps reflects the fact that operators on relatively larger farms would have both less time and need to engage in off farm employment. Farmers who have diversified their farm business were more likely to engage in off farm employment but once participating in the off-farm labour market were likely to have lower levels of labour supply. One possible explanation here is that farmers who have diversified are under greater financial pressure to obtain alternative sources of income to fund any investments accruing from their diversification activity and as such more likely to seek off farm employment. Once in the off farm labour market they are, however, likely to choose options that minimise the amount of hours spent on off farm work due to perhaps extra time constraints associated with their diversification activity.

In addition to an examination of the effect of demographic and structural farm factors this study added a novel contribution to existing research by examining the role of perceptions regarding the non-

pecuniary benefits from farming on the labour allocation decisions of farm operators. Policies and programs at the regional level could be aided by a better understanding of farming motivations so as to be able to tailor incentives for maximum efficiency. The results provide empirical support for the hypothesis that the labour allocation decisions of farm operators are influenced by much more than farm demographics and the financial benefits obtained, with the presence of non-pecuniary benefits associated with farming also playing a significant role. Due to the non-monetary benefits associated with the on farm work 'experience' maximising profit may not be the most important thing in farmers' lives. This means that even if the marginal returns of off farm income are higher, many farmers may be reluctant to allocate their time to off farm work. This would suggest that in order to fully understand farmers' behaviour in relation to off farm labour supply, and perhaps farm activity more generally, a better understanding of farming motivations will be needed. That is, social and psychological factors in addition to economic variables clearly influence farm operators' behaviour.

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Table 1: Factor loadings
Extraction method: principal component analysis

	Factor scores	Mean scores
Farming value		
Farming is a more rewarding job in terms of quality of life, independence, lifestyle than it is in terms of money	.848	8.36
I enjoy farming much more than I would other potential sources of employment	.856	8.35
I could make more money in other employment but I would miss farming too much to give it up	.514	6.92

Table 2: Logit model examining factors affecting off farm labour market participation of principal farm operators

Off farm job	Coef.	Std. Err.	P>z
Age 15-35 (over 50 is the reference category)***	1.121	0.432	0.009
Age 35-50 (over 50 is the reference category ***	0.824	0.273	0.003
Education ***	0.516	0.117	0.000
Children (no children is the reference category) *	0.504	0.264	0.057
Spouse income (spouse does not have an off-farm job or income is the reference category) ***	1.250	0.251	0.000
Dairying (non dairy farmers is the reference category) ***	-0.963	0.337	0.004
Stocking rate **	-0.013	0.006	0.030
Farm size ***	-0.404	0.102	0.000
Diversification (have not diversified is the reference category) *	0.462	0.255	0.069
Debt	-0.280	0.211	0.184
Farming value ***	-0.362	0.112	0.001
N = 525			
LR chi2(11) = 140.24			
Prob > chi2 = 0.000			

*** significant at 1% level, ** significant at 5% level, * significant at 1% level

Table 3: Generalised Tobit Interval model examining factors affecting off farm labour supply of principal farm operators

Off farm job	Coef.	Std. Err.	P>z
Age 15-35 (over 50 is the reference category)	-0.074	2.913	0.980
Age 35-50 (over 50 is the reference category ***	5.131	1.949	0.008
Education **	1.887	0.818	0.021
Children (no children is the reference category)	-2.993	2.058	0.146
Spouse income (spouse does not have an off-farm job or income is the reference category)	1.704	1.824	0.350
Dairying (non dairy farmers is the reference category) **	-7.156	2.942	0.015
Stocking rate	-0.021	0.039	0.584
Farm size *	-1.407	0.762	0.065
Diversification (have not diversified is the reference category) ***	-5.964	1.858	0.001
Debt	1.448	1.620	0.371
Farming value *	-1.393	0.797	0.081
N = 151			
LR chi2(11) = 38.48			
Prob > chi2 = 0.000			

*** significant at 1% level, ** significant at 5% level, * significant at 1% level

The Distributive Impact of the Economic Recession on Farm Households in Ireland

Cathal O'Donoghue, Teagasc Rural Economy and Development Programme

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Abstract

Despite the relatively buoyant commodity prices prevalent in 2011, farm households have faced a number of income shocks within the economic crisis in Ireland since 2008. Agricultural prices falls reduced farm based market income for a period. However in addition there has been a large fall in farm household off-farm employment amongst farmers, with off-farm employment rates returning to 1999 levels. However the employment rate of farm spouses has not been affected to the same extent. Reductions in subsidies such as REPS are also starting to bite and changes in taxation are also reducing welfare. In this paper we use a household based microsimulation model to simulate the impact of the economic downturn on Irish households using the Survey of Income and Living Conditions Survey. However as data on farm households is limited both in terms of detailed farming activity and also in terms of sample size, we use a data enhancement procedure to allow us to simulate in more detail the impact of these changes on farm households. To this we link the Teagasc National Farm Survey to the CSO Household Budget Survey in 2005 and statistically match these to the 2005 SILC data used within the model. Using the model, we decompose changes into labour market, farm price, consumer price, market (non-farm) earnings growth, subsidy and tax-benefit policy changes to assess the change in purchasing power at the farm level between 2005 and 2011. The study reports the differential impact on different types of farm households and compares the impact relative to non farm households.

Measuring the impact of trade policy reform in Ireland: A disaggregated analysis of household impacts[1]

Miller C., Boysen O., Matthews A., Donnellan T., and O'Donoghue C.

29 August, 2011

Abstract

This paper assesses the impacts of further multilateral trade liberalisation for Ireland with a particular emphasis on the agricultural sector. In addition to evaluating the aggregate impacts on agricultural production as well as the spill-over effect of this on the non-agricultural sector and for overall Irish GDP, the effects for different types of households are evaluated. In order to capture the economy-wide impacts of trade liberalisation, a CGE model was constructed using a social accounting matrix for Ireland for the year 2005. Household effects are captured using representative households. The simulation results suggest a small negative impact on the Irish economy. Many agricultural sectors contract in the process and the more efficient reallocation of resources into the manufacturing and services sectors does not fully compensate those losses. While urban households appear to be unaffected, rural and farm households are generally worse off.

Keywords: trade policy, Ireland, Doha Round, CGE model

JEL Classification: F13, D58, I3

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Contributed Paper Session 3

Rural Development

13.50 – 15.00

Room 1

Chair: Karyn Morrissey

To plant or not to plant? How farmers' make decisions on afforestation.

S. Duesberg (UCD), A. Ní Dhubháin (UCD), D. O'Connor (UCD)

To encourage farmers to transfer land into forestry, a generous premium scheme supporting farmers who afforest was implemented in Ireland in 1996. In the period from 1996 to 2006, however, only about half of the targeted area was planted. As financial returns for many farmers would improve when joining the scheme a number of studies have been conducted to find out why the response to the scheme was not as expected. However, to date the phenomenon has not been explained.

Amongst the studies undertaken so far a clear lack of qualitative approaches was identified. To understand the farmers' decision-making process regarding farm afforestation in-depth interviews with 63 farmers in counties Roscommon, Sligo and Westmeath were conducted in winter/spring 2010/2011. The interviews were based on the theory of behavioural assumptions underlying policy tools developed by Schneider and Ingram and Gasson's values of farmers. In the paper we present the results of these interviews and focus on the main reasons given for staying in farming or joining the forestry scheme.

Keywords: farm afforestation; diversification; decision-making

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Áine Ní Dhubháin (UCD, SAF)
Deirdre O'Connor (UCD, SAF)

Title: Rural Households' Experience of Access to Public Services in Northern Ireland

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AESI Annual Conference 2011

Key words: Access to services; rural; car ownership; disadvantaged households; public transport.

Abstract

Low-density populations and dispersed living inherent in rural areas often present challenges in terms of delivering services within these areas. Public and third sector service providers increasingly centralise their services to areas with high-density populations so they are closer to the majority of their clients. Furthermore, economies of scale are difficult to achieve in rural areas and so a large number of services and opportunities are located further away from people in rural areas. This distribution of services coupled with poor and often expensive transport in rural areas means that accessing services and activities are more difficult, time consuming and expensive for rural dwellers. This affects many areas of every day life e.g. travelling to school / college, accessing medical and caring services and financial services provision.

This study aims to establish whether the experiences of rural dwellers in Northern Ireland in accessing these key services, in particular health, education and financial services, is any different to that of their urban counterparts. The study focuses on the extent of both private and public transport usage in accessing key public services. Previous research has identified that issues surrounding access to services are often multifaceted, e.g. access being particularly difficult for those households without a car and who also experience low-income. Therefore, this study examines the experiences of service access for particularly vulnerable household types; namely: pensioner households (single and married), single parent households, low-income households and children. This research also explores what the relevant response from government should be in ensuring that access to key services in rural areas is equitable i.e. that there is an equivalence with the current and future provision of services in urban areas.

Our research methodology includes a desk literature review and household survey. The desk research examines the issues rural dwellers face when accessing key rural services (education, health care provision and financial institutions). In addition our desk research explores how various approaches and practices, including IT provision, have facilitated greater or improved access to the provision of service delivery within a rural context. A survey of households across Northern Ireland will focus on establishing households' experience of how transport impacts on accessibility to key public services, particularly focusing on the experiences of economically vulnerable groups. The survey will seek to obtain information on accessibility to key services, provision of public transport and the cost of travel.

Social Farming in Ireland: Bridging the gap – From a community of practise to a boundary organisation

Aideen McGloin[†], Deirdre O'Connor[†] and Jim Kinsella[†].

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Social Farming is an emerging phenomenon across Europe, which offers solutions to public service provision in rural areas through harnessing the multifunctional opportunities of farming communities. Social Farming has emerged from a confluence of issues around this role of agriculture; the challenges of social service provision in rural areas; the demands of people that use services for control of resources allocated for their care and the right to choose services that fulfil their needs.

In Ireland, the lack of coherent institutional support is hindering the expansion of Social Farming. It is of growing interest to policy domains in agriculture, rural development, health and social service provision - but strongly identified with none. An Action Research project has been underway in Ireland for the past 2½ years, with the objective of promoting the development of a cross-disciplinary supportive policy environment for Social Farming in Ireland. Community of Practice theory has been applied to a wide range of situations including organisational and knowledge management and as a point of entry for innovative practice. It provides valuable insights into the socio-cultural context and relational nature of knowledge. However it remains an all-encompassing theory that lacks specificity, particularly across boundaries of different organisations. This research analyses the development of a Community of Practice for Social Farming in Ireland from its initial establishment in 2009 through its evolution to a more structured institution that has more in common with current Boundary Organisation Theory. A Boundary Organisation (BO) approach utilises boundary objects as a means of creating, sharing and co-developing knowledge in the name of the organisation itself. However, the BO does not demand the overt support/compliance of the respective sponsoring 'parent' organisation(s). This research suggests that BO theory offers a clearer elucidation of the essential process of co-development of new knowledge across a range of disciplines and sectors of society to allow innovations in practice to be diffused.

Contributed Paper Session 3

Agricultural Policy & Prices

13.50 – 15.00

Room 2

Chair: Kevin Hanrahan

A Review of Farm Structure and Agriculture Policy in Canada and Comparisons to the EU

William J. Brown, Professor

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Canadian farm structure and agricultural policies are outlined here with some comparisons to the EU. Farm structure in Canada has changed over time, similar to that of most developed countries, with the largest farms producing significantly more proportionally of the agricultural production. The largest farms also receive a larger proportion of total government support, although less than their portion of production, again similar to most developed countries. The main Canadian agricultural policy instrument is called the "Business and Risk Management Program" and is composed of four subprograms entitled "Agristability, AgriInvest, AgriInsurance, and AgriRecovery". The Canadian Wheat Board, the sole exported of wheat and barley from the prairie region of Western Canada, and its future is a contentious issue particularly inside the prairie region but also due to its monopoly and state trading status with the WTO. The supply management policy developed for the dairy, poultry and egg sectors throughout Canada consists of production quotas, cost of production formulae, and import restrictions. Despite stabilizing incomes and increasing wealth in the dairy, poultry and egg sectors, it is a very contentious issue with respect to Canada's stance in the Doha round of the WTO negotiations as it requires Canada to restrict imports with Tariff Rate Quotas of over 200%. The supply management policy in Canada is an excellent example of how income in agriculture whether from the market or government is capitalized into the means of production. For example, the value of dairy production quota in Canada has increased to be worth about 20,000 euros for each of the approximately 1 million cows in the system. The question arises as to how governments can wean themselves off support for agriculture? A buyout of the supply management policy in Canada, if valued at market, would cost the government more the half of its current national deficit. Could the bond scheme as proposed in the EU have merit?

Key Words: Canada, farm structure, agriculture policy.

Agricultural Policy in Hot, Dry Summers:
Lessons from a Case Study of Ireland in 1976

David R. Stead, University College Dublin

With an apparent outlook for the Republic of Ireland of an increased incidence of heat waves and possibly dry summers, and in the context of wider current national policy debates about water services, managing severe weather events, risk management in farming, and food poverty, this paper analyses the experiences of Irish agriculture and government agri-food policy during the abnormally hot, dry summer of 1976 when the country experienced its twentieth-century record high air temperature. There have been no political economy type studies of that pan-European drought as encountered in Ireland comparable to those published for, say, Britain. After describing the drought's chronology and severity, the paper considers the impact on Irish agricultural output, prices and incomes. Potatoes, barley and sugar beet were the crops most adversely affected by moisture stress, with yields from managed pasture being approximately 10 per cent below potential in areas with a substantial water deficit. National aggregate gross output decreased by 4.6 per cent year-on-year in volume terms, and the rise in value terms looks less much impressive when compared against the similarly-high rates of general inflation at the time. Time-series of real gross value added in agriculture, and aggregate income from self-employment in agriculture, clearly suggest that 1976 was not a particularly bad year when viewed in a medium-term context.

Government responses, documented through recently-released files and other sources, included introducing aids to private storage for beef and measures to permit 'limited' potato imports and prevent cross-border potato smuggling. Irish agriculture was able to benefit commercially from the more severe production problems elsewhere in Europe through sales of intervention stocks of skimmed milk powder. A great deal of concern was expressed in Dáil Éireann and elsewhere in regard to consumer price increases, particularly of potatoes. Reassuringly, most of the crops worst affected in 1976 are of much less importance in Ireland nowadays. However some of the policy instruments utilized in 1976 have been rolled back under reforms of the Common Agricultural Policy, further highlighting the need for consideration of alternative risk-management policy instruments. Another of the conclusions arising from this reflection on past experience is that more attention may need to be paid to the indirect impact of future heat waves and droughts on the budgets of Irish food consumers, by rising prices.

Managing Volatility and Risk to Enhance Cashflows through the Agribusiness Supply Chain – A Practitioner's Perspective.

David Stack, Agrimax & Helyette Geman, Birkbeck

The authors present a practitioner's view of modern financial risk management and its use for income volatility reducing strategies which are a win-win for producers and consumers. A detailed discussion of how implied volatility is priced and managed is presented along with a critical analysis of a series of commonly held views on how volatility is calculated. The authors conclude this is often from a marginal price series of market clearing and consequently highly volatile prices, exaggerating the true volatility of markets. It is argued that policy makers must make a more determined effort to capture and report spot and forward prices to further the development of financial risk management and that it is only through a whole supply chain that the goal of reducing income volatility can be achieved – quite separate from observed price volatility. The natural or native volatility of individual commodities and their root characteristics and causes are discussed. The role of academic, research, regulatory and market supervisory institutions is discussed and recommendations are made.

Keywords: *Volatility, Income, price levels and changes, financial risk management, monte carlo, options, supply chains.*

Contributed Paper Session 3

Innovation & Agribusiness

13.50 – 15.00

Room 3

Chair: Danny Campbell

Problem Solving Innovation Systems and the Irish Dairy Sector

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Paper for the Agricultural Economics Society of Ireland Conference
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Key words: Innovation systems, problem solving, agriculture, dairy value chain, mastitis.

Abstract

Increasingly it is argued that it is appropriate to consider innovation as a systemic process both for policy formulation reasons and also as a basis for empirical analysis (e.g. EU 2011; OECD, 2010; FAO 2001). Such an approach is exemplified by the innovation systems framework. However, it is also recognised that innovation systems might not always be purposive (e.g. Leeuwis and van den Ban, 2004). Therefore, this paper seeks to explore an emerging notion, that of 'problem solving innovation system' (Anandajayasekeram and Gebremedhin, 2009; Metcalfe and Ramlogen, 2008; Antonelli, 2005, 2001) and its possible application to agricultural innovation issues. The idea is that an innovation system can be made purposive and directed towards a local problem for a period of time. However, a key challenge in making this a useable framework is to consider how to operationalise it. Two possibilities to operationalise innovation systems are considered; first, the World Bank (2007) approach and second, the Bergek et al (2008) contribution. Finally, two potential applications of the 'problem solving innovation system' approach to the Irish dairy sector are outlined. The first, concerns innovation related nodes in the dairy value chain. The second focuses on a knowledge transfer initiative to reduce high somatic cell counts and incidences of mastitis.

Milk Transport Options for an Expanded Dairy Industry Post Milk Quota Removal in 2015

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In the European Union under the Common Agricultural Policy (CAP) milk production was restricted by milk quotas since 1984. However, due to recent changes in the Common Agricultural Policy (CAP), milk quotas will be abolished by 2015. Therefore, the European dairy sector will soon face an opportunity, for the first time in a generation, to expand.

The FAPRI-Ireland farm level model estimated an increase in milk supply in Ireland of 45% by 2020. A milk transport model incorporating milk processor location was developed and adapted to reflect the current structure of the dairy sector in Ireland (processor configuration and farm layout and spread). The model was then used to assess the impact of the changes in the projected farm level production. Based on current processing capacity it was estimated that the peak milk supply will exceed current capacity post milk quota abolition. Processors who have excess supply may opt to build new processing facilities or expand existing processing facilities. Using transportation algorithms this study identified the optimal locations for expansion of existing facilities in the context of the likely regional milk supply expansion patterns taken from the FAPRI-Ireland farm level model. The study also identified the optimal location of Greenfield sites, taking cognisance of milk transport costs and changing circumstances at both farm and processor level.

This study could be used to help improve the decision making process around changes in the milk processing sector in Ireland.

Key Words: Milk Transport, Milk Quota Removal, Expanded Dairy Industry

Summary of Proposed Paper

In the study the FAPRI-Ireland farm level model was used to estimate the regional increases in milk production post quota abolition. The analysis evaluated expansion levels at a number of different milk prices and projected an increase of 45% by 2020 at a milk price of 28c/l, with the vast majority of this expansion in the south of the Country. Based on current processing capacity nationally, there would be a requirement to construct additional processing capacity to process the milk at peak. The milk transport model was used to identify the optimal locations for expansion of existing facilities as well as building new Greenfield milk processing facilities (with 29 different locations evaluated).
When the additional milk supply in 2020 was routed to 1 site currently in operation, Mitchelstown was found to be the site with the lowest milk transport costs which equated to 1.01 cent/litre with all existing milk routed to its existing original milk plants. When two existing sites were expanded instead of one, the two optimum expanded sites became Mitchelstown and Macroom with transport costs of 0.97 cent/litre. When three sites were expanded the three optimum expanded sites became Mitchelstown, Macroom and Ballyragget with transport costs of 0.94 cent/litre.

In the study Glanmire was found to be the least cost Greenfield location with national transport costs of 1.01 cent per litre with all existing milk routed to its existing original milk plants. Other Greenfield sites examined included Dungarvan, Croom, Horse and Jockey and Belview Port with transport costs of 1.03cent/litre, 1.04 cent/litre, 1.07 cent/litre and 1.10 cent/litre respectively.

Further cost reductions could be made if the milk was collected by optimal milk catchment regions, in order for this to occur milk processors would need to route milk to the closest plants rather than the current situation where milk is routed by catchment region. This would equate to yearly savings of €6.6 million, €6.32 million and €6.28 or 9.65%, 9.65% and 9.92% for 1 site, 2 sites and 3 sites respectively. Therefore the findings suggest that processors would achieve significant cost reductions by co-operating in milk transport activities.

There are milk transport costs savings available from increased numbers of sites and for milk to be collected by optimal location to processing site. The next phase of this analysis is integrating the effect of plant scale and operating costs with milk transport cost.

Innovation in Irish Food SMEs: the Good, the Bad and the Different

Dr Maeve Henchion[1], Gráinne Kavanagh[1, 2], Dr Gwilym Williams[2], Dr Mary McCarthy[3]

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The Irish food industry has significant potential to support export-led economic recovery and contribute to the *Food Harvest 2020* industry vision. Investment in research and development (R&D) and the transformation of R&D outputs into commercial outputs through innovation will be an important factor in realising this vision. A recent study by Teagasc (in conjunction with DIT and UCC) sought to increase understanding of the innovation activities in Irish food small and medium enterprises (SMEs) with a view to maximising return from investment in publicly funded research.

Building on a literature review and in-depth interviews with key food industry representatives, a postal survey of Irish food SMEs was undertaken (n=399). A satisfactory response rate of 32% (n=128) was achieved. Respondents were broadly representative of the Irish food industry in terms of sector, size, location and export status.

Key findings indicate that Irish food SMEs are quite innovative. When assessed using traditional measures, innovation levels seem low, e.g. one in five companies reported using patents. However when assessed in terms of innovation outputs they perform quite well - 78%, 57% and 53% respectively engaged in product, packaging and process innovation in the last 3 years. A tenth indicated they had not engaged in technology innovation in the last three years. Organisational innovation and marketing innovations were also reported. The survey found further good news in terms of the presence of innovation supporting factors within companies.

Of concern is the fact that the innovation activities of some companies are not strongly influenced by the external business environment. For example, in this study, both product and process innovators perceived a higher level of impact from the industry environment (competitors, suppliers, consumers and retailers) than those not innovating. Non-innovating companies did not seem to recognise the relevance to their activities of the drivers of innovation that were motivating companies with higher levels of absorptive capacity.

The type of technological innovation a company engages in has an influence on the way in which they rank the importance of environmental factors on innovation activities. While product innovators were more concerned about following consumer trends, process innovators appeared to be motivated by efforts to reduce operating costs (*e.g.* wages bill and energy costs). Interestingly, companies involved in packaging innovation did not appear to be motivated by the factors found to be driving process and product innovators.

The findings of this study have practical implications for the design and delivery of innovation support measures for Irish food SMEs.

Plenary Session 2: Sustainability from Farm to Fork

"Green Growth – the new paradigm for agriculture"

Wilfrid Legg (formerly OECD)

&

"Kitchen stories: imagining eating practises in 2050"

Prof. Anna Davies (Trinity College Dublin)

15.20 – 17.00

Room 1

Chair: Fiona Thorne