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FARE Share

What's Inside?

This issue of *FARE Share* starts with a call for feedback. With 15 regular issues and three special editions under our belt, it's time to take stock of how we are doing.

Inside, you'll read about the agglomeration effects in Ontario's dairy farming sector. You'll also learn the economics of reducing nitrates from potato farming systems on Prince Edward Island.

On the back cover, a regular *FARE Share* contributor examines the road between research and policy change.

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The FARE Share Newsletter features research and analysis from faculty and students in the Institute for the Advanced Study of Food and Agricultural Policy in the Department of Food, Agricultural and Resource Economics (FARE).

Commentary Versus Content: We Need Your Feedback

The inaugural issue of *FARE Share* was launched in the summer of 2012. In the past five years, we have published 15 regular issues and three special editions dealing with topics ranging from anaerobic digesters and food fraud to food processing competitiveness and the Trans-Pacific Partnership. It is time for a progress report from you, the reader.

My intention for *FARE Share* was to provide new and relevant content, primarily based on research being undertaken in the Department of Food, Agricultural and Resource Economics. While the news market on agriculture and food issues can

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seem overly saturated, my hope is that *FARE Share* stands apart, to some extent, because the articles are driven by our research. Has this hurt the timely delivery of articles? I believe no although in a few instances we have purposefully not provided commentary because the necessary research had yet to be undertaken. Given this restriction, in your view is *FARE Share* achieving its mandate to provide new and relevant content on important agriculture and food issues?

It is time for your feedback. My email is aker@uoguelph.ca, please take the time to drop me your thoughts on the relevance, or lack thereof, of *FARE Share*.



Alan Ker
*Professor and Director,
Institute for the Advanced Study of Food and
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President, Canadian Agricultural Economics Society*



Institute for the Advanced Study
of Food and Agricultural Policy

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Agglomeration Effects in Ontario's Dairy Farming

By: Getu Hailu, Associate Professor, and Brady Deaton, Professor, FARE

This research examines the agglomeration hypothesis, which states that a firm's productive efficiency is increased by closer proximity to other firms. Using a stochastic input distant function with heteroskedastic inefficiency effects, we find that the density of Ontario dairy farms has a significant positive economic effect on production efficiency. This finding has implications for understanding agricultural firm location and farmer-led efforts to preserve agricultural farming activities in specific locations.

Our research shows that Ontario dairy farms situated in areas characterized by high dairy farm density are more efficient than a similar dairy farm located in areas of low density. Moreover, we find evidence that Ontario dairy farms located in high density areas are more similar with respect to efficiency measures than dairy farms located in areas that are less concentrated with respect to dairy production. To oversimplify the matter, being near more farmers appears to make a farmer more productive and more like his or her neighbours. This finding supports the agglomeration hypothesis; the exchange of productivity-enhancing information appears to be enhanced by proximity and density to similar firms that become more similar as a result of this information exchange.

“Our research shows that Ontario dairy farms situated in areas characterized by high dairy farm density are more efficient than a similar dairy farm located in areas of low density.”

Our findings may support an enhanced understanding of a number of potentially related phenomena in the agricultural sector. For example, the supply of agricultural land is relatively inelastic; hence, increases in demand for land in areas of high firm concentration (because of the agglomeration effect) may result in relatively higher land values.

Our findings are also useful in understanding the influence of urbanization on the viability of farming. While increased proximity to urban areas provides opportunities that may enhance the viability of farming, for example, access to a new customer base

and increased land values, increased proximity to urban areas can also generate negative externalities such as traffic and conflict with urban neighbours that may diminish the viability of farming.

With respect to the effect of urbanization on farm viability, two findings stand out. First, to the extent that urbanization effectively reduces the density of dairy farming in a specific area, our research on the agglomeration effect suggests that this will have a negative effect on dairy efficiency. Importantly, our analysis provides a second empirical finding that is relevant to the literature examining farm viability and urbanization. In our analysis, efficiency increases as we move away from urban areas (even controlling for the agglomeration effect). Since we control for the cluster effect, our findings are relevant to future literature that seeks to identify the multiple ways that urbanization may influence farm viability.

From an outreach perspective, our results support the general idea that enhanced opportunities to exchange information will improve agricultural productivity. This idea undergirds the historical motivation for extension programs throughout the United States. Our findings seem to suggest that the exchange of information between farmers is particularly important. In this regard, there may be an opportunity for collaboration between researchers and extension agents to further explore the costs and benefits of efforts designed to enable increased communications between farmers.

“From an outreach perspective, our results support the general idea that enhanced opportunities to exchange information will improve agricultural productivity.”

The full article is published in the *American Journal of Agricultural Economics* (Volume 98, Issue 4, July 2016). To access a copy: <https://academic.oup.com/ajae/article-abstract/98/4/1055/1739862/Agglomeration-Effects-in-Ontario-s-Dairy-Farming?redirectedFrom=fulltext>

FARE Professor Presents Research to Senate

Research conducted by Dr. Brady Deaton, FARE Professor, is making an impact in the nation's capital. The McCain Family Chair in Food Security was recently called to the Senate to present his findings and insights about Canadian farmland. He addressed the Standing Senate Committee on Agriculture and Forestry in Ottawa on February 16, 2017. His opening statement included factors driving farmland prices, farmer concerns about non-farmer acquisition of farmland, and policies that influence who can own farmland.

Read Dr. Deaton's complete statement at www.uoguelph.ca/fare/institute/newsletter.html or watch his address at <http://bit.ly/2lqHaVg>.





BMP Adoption & Groundwater Quality

By: Alfons Weersink, Professor, FARE and Erin Bishop, Economist, Environment and Climate Change Canada

There is significant community interest in reducing nitrates in groundwater on Prince Edward Island (PEI). This is illustrated by the popularity of the province's agricultural programs that incentivize traditional Best Management Practices (BMP) adoption for potato farmers – for example, cover cropping, riparian buffers, and erosion control structures. We know relatively little, however, about the costs and benefits of adopting a combination of non-traditional BMPs (e.g., spring tillage, growing alternate potato varieties, varied nutrient fertilizer rates, crop rotation, and sensitive land retirement) that effectively reduce nitrate leachate on diverse farm landscapes, or how to motivate the adoption of such BMPs by Island farmers.

PEI residents rely solely on groundwater as their source of drinking water. Groundwater flows represent 60-70% of surface waters such as streams and estuaries in PEI. Residual nitrates from intensive potato farming are non-point source contaminants that have caused eutrophication and recurring anoxic events in estuaries, and nitrates exceeding Health Canada's drinking water guidelines have been measured in some residential groundwater wells.

An economic-hydrologic optimization model was used to estimate the cost a farmer incurs to adopt BMPs that reduce nitrate leachate in groundwater under several scenarios with varied nitrate reduction targets. The BMPs considered were sensitive land retirement, crop rotation, Prospect potato variety, nutrient management planning fertilizer rates, and spring tillage.

We find that, for farmers on both high- and low-quality land, growing the traditional Russet Burbank potato variety with the standard nitrogen fertilizer rate and fall tillage timing is the most profitable potato farming system when no nitrate abatement targets are imposed.

The currently implemented *Prince Edward Island Agricultural Crop Rotation Act* (PEI ACRA) necessitates farmers to adopt a minimum crop rotation in order to reduce soil erosion and indirectly reduce nitrate leachate in groundwater and runoff into surface water.

To achieve even greater nitrate abatement targets, a nutrient management plan followed by spring tillage must also be adopted. Farmers on high-quality land have the ability to achieve higher nitrate abatement targets because their land quality enables more BMPs to be adopted. The abatement costs are higher for a farmer adopting these practices than those incurred by a farmer on low-quality land.

The research findings also indicate that the target set by the local watershed association of 970 kg NO³-N, on either low- or high-quality land, is estimated to never be feasible when the economic factors to meet the target are considered.

“Farmers on high-quality land have the ability to achieve higher nitrate abatement targets because their land quality enables more BMPs to be adopted.”

What are the implications for policy makers?

Farmers differ with respect to abatement costs and nutrient application behaviour; policies and programs that strive to reduce groundwater and surface water contamination may consider recognizing and tailoring incentives based on the following differences:

- The adoption of the Prospect potato variety is a cost-effective BMP that abates nitrate leachate.
- When nitrate abatement targets are high, marginal abatement costs differ between farmers such that farmers on lower-quality land incur higher costs.
- Incentives, such as water quality markets or cost-share programs for BMP adoption, should be tailored to farmers based on differences in marginal abatement costs.
- Neither low- nor high-quality land farmers can feasibly attain the local watershed association's nitrate abatement target given the abatement potential of adoptable BMPs and their costs.
- Policy makers should consider economic, hydrogeologic and ecological factors to set achievable, economically viable nitrate abatement targets.



Institute Conference

"Big Data, Changing Climate & Agriculture" is the title of the much-anticipated mini-conference to be hosted by the Institute for the Advanced Study of Food and Agricultural Policy on May 16, 2017. Attendees will hear from experts on timely topics, including:

How Big Data Has Changed Agriculture

– Dr. Keith Coble, Giles Distinguished Professor and Head, Department of Agricultural Economics, Mississippi State University

Innovation & Climate Induced Yield Volatilities –

Dr. Alan P. Ker, Professor and Director, Institute for the Advanced Study of Food and Agricultural Policy, University of Guelph

Big Data & Agricultural Business Risk Management Policy –

David Hagarty, Policy Director, Farm Finance Branch, OMAFRA

Climate Change & Agricultural Policy –

Sharon Bailey, Policy Director, Food Safety & Environmental Policy Branch, OMAFRA

The event will take place at the University of Guelph starting at 12:30 pm and wrap up by 4:30 pm. Registration is free, but space is limited. To register, contact: dharkies@uoguelph.ca.

For more Institute news and events, visit: <https://www.uoguelph.ca/fare/institute/advanced-study.html>

Write It and They Will Come

By: Karl D. Meilke, Professor Emeritus, FARE



It is a shared belief among economists that good research is required to facilitate good public policy. This belief was supported by Agriculture and Agri-Food Canada in funding the North American Agrifood Market Integration Consortium (1995-2008) and the Canadian Agricultural Trade Policy and Competitiveness Research Network (CATPRN 2004-2013); likewise, OMAFRA funds a wide range of research projects at the University of Guelph to support Ontario's agri-food sector.

To provide good policy advice, at a minimum, three steps are necessary: 1) conduct the research; 2) prepare written material to explain the research; and 3) make the research available. The last point gets far more discussion than the first two. In the pre-internet days, working papers were circulated informally among like-minded researchers. The internet and especially AgEcon Search have changed all that. AgEcon Search has become, since its founding in 1995, the most important repository for working papers and other scholarly works in food, agricultural and resource economics.

The development of AgEcon Search has provided us with another metric of the importance of research in food, agricultural and resource economics – downloads. While downloads, like citations, are a flawed measure of a paper's contribution we can be pretty sure if a paper is not read it has no impact. Does a download equal a read? No, but a download might be as good a metric as a citation – yes, papers are often cited that are not read by the person citing them.

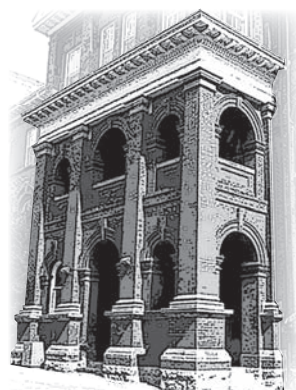
As a case study, I am going to use the 82 working papers and commissioned papers written by 84 different authors for the CATPRN between 2004 and early 2014. Commissioned papers resulted from projects with small budgets and were written

with a general audience in mind. Working papers generally resulted from projects with larger budgets, often employing graduate students doing their dissertation research. The first paper was posted in late 2004 and the final paper in early 2014. The data on downloads show that the 48 working papers were downloaded 16,459 times and the 34 commissioned papers 12,837 times by July 2016. The nearly 30,000 total downloads underestimate the total number of downloads because all of the papers were also available on the CATPRN website where we do not have a download counter, as well as from individual authors. A complete analysis of the download data is available in Meilke (2016) but the following is clear.

- On average, working papers were downloaded 343 times and commissioned papers 378 times. Our work has an audience.
- Our research has a long tail. About 30% of the total downloads have taken place since the last paper was posted, more than 2.5 years ago.
- It is not always easy to know which papers/topics will be popular. Papers with the most downloads tended to focus on key policy issues such as the Canada-EU trade negotiations, the economic performance of the Canadian Wheat Board, the determinants of farmland value and some aspects of supply management. Yet, other popular papers seemed less central to the current policy debates, e.g., food aid and EU environmental policy.

In conclusion, the road between reading a good research paper and ultimate policy changes is a crooked and messy one. However, our world faces many challenges and to meet those challenges in intelligent and cost-effective ways requires sound economic analysis. If it is prepared – it will be read – and ultimately lead to better public policy.

To read the full version of this article, please visit: www.uoguelph.ca/fare/institute/newsletter.html



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