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Understanding the effectiveness of knowledge transfer methods



Key external stakeholders:

Agricultural consultants, Animal Health Ireland, Agricultural Education Providers, New Dairy Entrants, Young Farmer Organisations

Practical implications for stakeholders:

The project sought to improve knowledge about KT (including advisory and education) methods, services, processes and impacts in the specific contexts of 1) mastitis prevention, 2) new entrant dairy farmers, 3) young farmers, 4) farmer income and profitability, 5) returns to education and 6) use of financial management practices.

- Detailed evidence on the impact of different KT services and methods was generated.
- Confirmation that the impact of KT is related to the access to and quality of services available.
- Acknowledgement that different KT support services are required at different stages of on-farm innovation

Main results:

The project identified the impact of different types of KT activities (advisory service & agricultural education) on farm level outcomes and the cost benefit of such different types of KT activities.

Opportunity / Benefit:

External stakeholders can access the results through the academic and popular publications and presentations from international conferences. Also, the 3 Walsh Fellows connected with this programme are now working in the sector. Internal stakeholders (KT Directorate) have accessed the results throughout the project through participation on steering, advisory groups and with direct project work.

Collaborating Institutions:

UCD, NUIG, DCU, Motiveworks

Teagasc project team:	Dr. Kevin Heanue (PI) Dr. Cathal O'Donoghue Stuart Green Fintan Phelan Dr. Aine Macken Walsh Dr. Brendan Horan Finola McCoy Anthony Cawley (WF) Jessica McKillop (WF) Roberta McDonald (WF)
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1. Project background:

It is important for KT providers to have evidence on the impact of, and processes supporting, knowledge transfer. This project contained six independent studies in relation to KT methods and activities, under the common theme of improving understanding of the effectiveness of KT activities, methods and support structures. The project incorporated two full and one partial Walsh Fellowship PhD studies supported by a multidisciplinary Teagasc and external organisation project team.

2. Questions addressed by the project:

- What is the relationship between KT activities and farm level outcomes?
- What are the costs and benefits associated with various KT activities?
- How do KT activities for new entrants to dairying impact their ability to value, assimilate and exploit new information and knowledge?
- What are the economic, policy and organisational environmental factors critical for the success of specific KT activities focused on animal health?
- What are the issues around a) the non-use of financial management tools and best practice by farmers b) why, even when farmers complete financial management tools, they don't use them for decision making and c) what role can KT activities play in influencing a) and b)?
- What is the relationship between participation in formal agricultural education, farm level income outcomes and the pathways by which these outcomes are realised via innovation and management practice?
- What is the innovation profile (use of technologies) of young farmers?
- How does the support infrastructure impact innovation at different phases of the innovation process?

3. The experimental studies:

This multi-methods research project redressed existing research gaps by quantifying (via econometric & statistical methods) *what* the impact from KT was for different categories of farmers followed by explaining the process of *how* this impact was achieved at farm level (via focus groups, case studies & interviews). The project also took a systems view of innovation supports for farmers and food companies at different stages of the innovation process.

4. Main results:

- A positive impact of 35 per cent for KT participation on farm income over the period 2000-2013 in Ireland implying that previous research underestimated the benefits of participation.
- During the recessionary period 2008-2014 when some Teagasc offices closed and the numbers of

advisors were reduced, there was still a benefit to holding an annual advisory contract with Teagasc in terms of profitability (increase in market gross margin per hectare), However, this benefit was reduced as the ratio of clients per advisor increased.

- The motivation of the farmer to participate, learn and implement new knowledge are the key drivers of impact from KT and that this depends on the level of trust and credibility in the organisation, their relationship with the adviser and the types of activities and specific content on offer.
- Identification of 4 recommendations on how to support part time innovation brokers in the Cellcheck Programme on mastitis prevention and control.
- Farmers do not deviate from the routine developed around mastitis prevention until there is an indication of infection, as well as constraints around the availability of labour and time. Farmer behaviour with respect to mastitis management can thus be considered as reactionary as opposed to precautionary.
- There are differences between actual on-farm innovation by young farmers and what would be considered 'important' innovations by subject matter specialists.
- Formal agricultural education positively impacts private returns in terms of improved technical and allocative efficiency. There is also a positive social return.
- The process by which farmers engage with financial data and make financial related decisions is highly complex and crucially involves mediating farmer behaviour.
- For new entrant dairy farmers there is a high rate of grazing, artificial insemination (AI) and financial management technology adoption. Their technology decisions are primarily motivated by financial considerations and are closely related to the Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) of the technology. Grassland measurement had the lowest adoption rate (51%) compared to AI (86%) and farm financial management (84%).
- The substantial importance of PU and PEOU to technology adoption decisions indicates that future research, extension and education programmes should place increased emphasis on the benefits and usability of key technologies in addition to evaluating their scientific merit.
- For the first time information assessing technology adoption amongst new dairy farmers is available. This has the potential to improve and increase extension and education for new dairy farmers in a future post-quota environment.
- Based on the spiral of innovation tool, different innovation supports from different actors in the innovation system are important for farmers at different phases of innovation.

5. Opportunity/Benefit:

The primary stakeholder for this research is private and public sector KT actors, and policy makers. Overall, the research highlights the valuable role of KT and KT agents in particular but concludes that engagement around knowledge transfer, technology adoption and innovation support is particularly complex and context specific.

6. Dissemination:

Project results and implications are disseminated through academic and popular publications.

Main publications:

Cawley, A., O'Donoghue, C., Heanue, K., Hilliard, R. and M. Sheehan (2019) The impact of agricultural knowledge transfer resources on farm level profitability during the economic recession - a quantitative study, *Journal of Agricultural Education and Extension* 25(2): 1-17

Faure, G., Knierim, A., Koutsouris, A., Ndah, H. T., Audouin, S., Zarokosta, E., Wielinga, E., Triomphe, B., Mathé, S., Temple, L., and Heanue, K. (2019) How to strengthen innovation support services in agriculture with regard to multi-stakeholder approaches, *Journal of Innovation Economics and Management*, 1, No. 28, pp. 145-169

Jessica McKillop, Kevin Heanue & Jim Kinsella (2018) Are all young farmers the same? An exploratory analysis of

on-farm innovation on dairy and drystock farms in the Republic of Ireland, *The Journal of Agricultural Education and Extension*, 24, 2: 137-151

Emma Jane Dillon, Thia Hennessy, Peter Howley, John Cullinan, Kevin Heanue & Anthony Cawley (2018) Routine inertia and reactionary response in animal health best practice, *Agric Hum Values* 35:207–221

O'Donoghue, C and Heanue, K. (2016) The Impact of Formal Agricultural Education on Farm Level Innovation and Management Practices, *Journal of Technology Transfer*, <https://doi.org/10.1007/s10961-016-9529-9>

Cathal O'Donoghue, Alistair McKinstry, Stuart Green, Reamonn Fealy, Kevin Heanue, Mary Ryan, Kevin Connolly, JC Desplat, Brendan Horan, Paul Crosson (2016) Developing a Big Data Analytical Solution to Low Farmer Engagement with Financial Management, *International Food and Agribusiness Management Review*, 19, A: 131-154

McDonald, R., Heanue, K., Pierce, K and Horan, B. (2016) Factors Influencing New Entrant Dairy Farmer's Decision-making Process around Technology Adoption, *Journal of Agricultural Education and Extension*, 22, 2, 163-177, April. DOI:[10.1080/1389224X.2015.1026364](https://doi.org/10.1080/1389224X.2015.1026364)

Popular publications:

Heanue, K. Macken-Walsh, A. and Maher, P. (2012) *Teagasc Best Practice in Extension Services Conference - Supporting Farmer Innovation*. Teagasc Oak Park, ISBN: 1-84170-593-4. https://www.teagasc.ie/media/website/publications/2012/Knowledge_Transfer_Conference_Proceedings_2012.pdf

Maher, P. Heanue, K., O'Sullivan, L., and Deane, A. (2013) (eds) Knowledge Transfer Conference 2013 '*Future of Farm Advisory Services: Delivering Innovative Systems*' Teagasc <https://www.teagasc.ie/publications/2013/knowledge-transfer-conference-2013-proceedings--presentations.php>

7. Compiled by: Dr Kevin Heanue
