

Development of food science and technology knowledge and skills base in Wales, UK.

L. Ellis, E.W. Evans, S. Mayho and E.C. Redmond

ZERO2FIVE Food Industry Centre Research Group, Cardiff Metropolitan University, Wales, United Kingdom.

*Corresponding author: lellis@cardiffmet.ac.uk

Introduction

The food and drink manufacturing and processing (FDMP) industry is a significant contributor to the UK with Gross Added Value reported as £22.8 billion (FDF, 2017). In Wales, the FDMP industry is a major employer and is considered to be part of the 'foundational economy' and is one of the three priority sectors in Wales (Food and Drink Wales, 2017).

The Welsh FDMP industry employs 22,400 people (Food and Drink Wales, 2015) and research has found that 50,000 more workers are required by 2022 (Warren-Thomas and Henderson, 2017). Indeed, 40% of Welsh businesses have reported to have technical skills gaps; investigations show that 15,000 people would require training 2015-2022 (Warren-Thomas and Henderson, 2017). There is a need for the FDMP industry to attract technical employees and upskill the existing workforce to support and progress sector innovation and automation.

Purpose

This study aims to consolidate and evaluate approaches implemented to technically upskill and increase food-sector employment in Wales, UK.

Methods

- Five substantial projects (~15million) implemented by ZERO2FIVE Food Industry Centre (FIC) and Food Innovation Wales (FIW) between 2008-2019 have been reviewed and evaluated.
- These projects have included novel knowledge-transfer approaches (Knowledge Innovation Technology Exchange (KITE) and Project HELIX), development of processes to upskill food science and technology (FST) in Wales including postgraduate courses, professional workshops and processes to facilitate FDMP industry student placements.
- Evaluation of such projects has occurred using process and outcome evaluative approaches with a focus upon improved FST knowledge, intervention approaches, business employment and technical capabilities.

Acknowledgements

Funding to complete elements of this research was received from the following: Higher Education Funding Council for Wales, European Social Fund and the Welsh Government.

References

- Food and Drink Federation (FDF) (2017) The Food and Drink Industry. Economic Contribution and Growth Opportunities. Food and Drink Federation.
- Food and Drink Wales (FDF) (2017) Transforming Skills in the Welsh Food and Drink Industry. [Accessed 230719] https://businesswales.gov.wales/foodanddrink/sites/foodanddrink/files/180209%20F%26D%20Industry%20Skills%20A4%20ENG_1.pdf
- Food and Drink Wales (2015) The Value of Welsh Food and Drink. Executive Report. https://businesswales.gov.wales/foodanddrink/sites/foodanddrink/files/Food%20-%20SA%20-%20Economic%20Appraisal%20-%202014%20-%20Executive%20Report%20Final%20-%20Doc%20-%20-%20English%20-%20July%202015_1.pdf
- Mayho, S., Redmond, E.C. and Lloyd, D. (2019) Food safety management and technical innovation in Welsh food-sector SMEs: impact of Project HELIX. Presented at EFFOST International Conference, Rotterdam, The Netherlands.
- Redmond, E.C. (2015) Welsh Government / European Union Final Evaluation of the KITE Feasibility Project. Cardiff Metropolitan University for the Welsh Government. (12/2015)
- Redmond, E.C., Mayho, S., and Lloyd, D. (2019) Progression of food industry technical and food safety support for manufacturing and processing small and medium sized enterprises in Wales, UK. Presented at EFFOST International Conference, Rotterdam, The Netherlands.
- Warren-Thomas E. and Henderson, E. (2017) The Food and Drink Industry in Wales. (<http://www.assembly.wales/research%20documents/17-021/17-021-web-english.pdf>)

Results

The five projects evaluated have cumulatively contributed considerably to the knowledge and skills base through training, knowledge transfer, education and recruitment of more young people into technical roles. Findings are presented below:

Food Industry Skills Project (FISP): Funding, Scope and Outputs

- The Food Industry Skills Project (FISP) (2008 - 2011) was a Higher Education Funding Council for Wales (HEFCW) collaborative third mission funding project cumulatively worth £308,000.
- Collaborative partners included the Sector Skills Council for Food and Drink (SSCFD) (Improve Ltd.) (now National Skills Academy), Coleg Menai (now Grŵp Llandrillo Menai), Food Centre Wales, University of Glamorgan (now University of South Wales) and Aberystwyth University.
- The project aimed to: identify and address the skills and needs of the FDMP industry, increase the supply of graduates, develop high quality training initiatives and build lasting stakeholder relationships.

FOOD INDUSTRY SKILLS STRATEGY GROUP
FOOD INDUSTRY SKILLS PROJECT

Key FISP outputs:


- Feasibility of a 'one stop shop' for skills and training needs in Wales
- Implementation of a student placement bursary scheme
- Development and delivery of short food sector courses
- Determined need for a FST Foundation Degree in Wales
- Development and delivery of industry focussed blended learning MSC
- Dissemination of data at 39 conferences, conferences, careers events
- Industry/stakeholder communications via newsletter
- Partner steering group

Food Industry Learning Online (FILO): Funding, Scope and Outputs

- Food Industry Learning Online (FILO) (2011 – 2014) was created as part of the Work Based Learning Programme, funded by the European Union (EU) Convergence European Social Fund (ESF) (£254,297) over 3 years, via the Welsh Government.
- FILO provided FDMP industry specific modules that were flexible, short and university accredited. The modules were partly or wholly funded for FDMP businesses across the Convergence region of Wales.

Key FILO Outputs

- Development and delivery of FST level 4/5 and 7 blended learning modules.
- 27 learners benefited from the funding
- Level 7 FST modules continue to be delivered



Technical Skills Project: Funding, Scope and Outputs

- Welsh Government funded a nine month 'Technical Skills' project (2018), to provide industry with access to a highly skilled workforce via the development, delivery and evaluations of bespoke in-house courses covering three of the top 10 non-conformances for British Retail Consortium Global Standard for Food Safety (BRCSGSF).
- Development and implementation of a student bursary scheme aimed at increasing the number of young people studying FST and therefore, leading into FDMP industry careers in Wales.

Key 'Technical Skills' Project Outputs


- 6 short FST courses were developed
- 4 short FST courses delivered
- 147 learners across 10 food and drink businesses
- Bursary Scheme

Knowledge Transfer: Funding, Scope and Outputs

- ZERO2FIVE FIC implemented mechanisms to address the lack of skills and training needs of FDMP SMEs in Wales. The KITE Project was a knowledge transfer programme which placed food or science graduates in food companies with the aim of addressing a specific technical issue.
- The aim was to develop graduates during the placement and develop the company via knowledge transfer from academic and industry professionals.

Knowledge Transfer Outputs

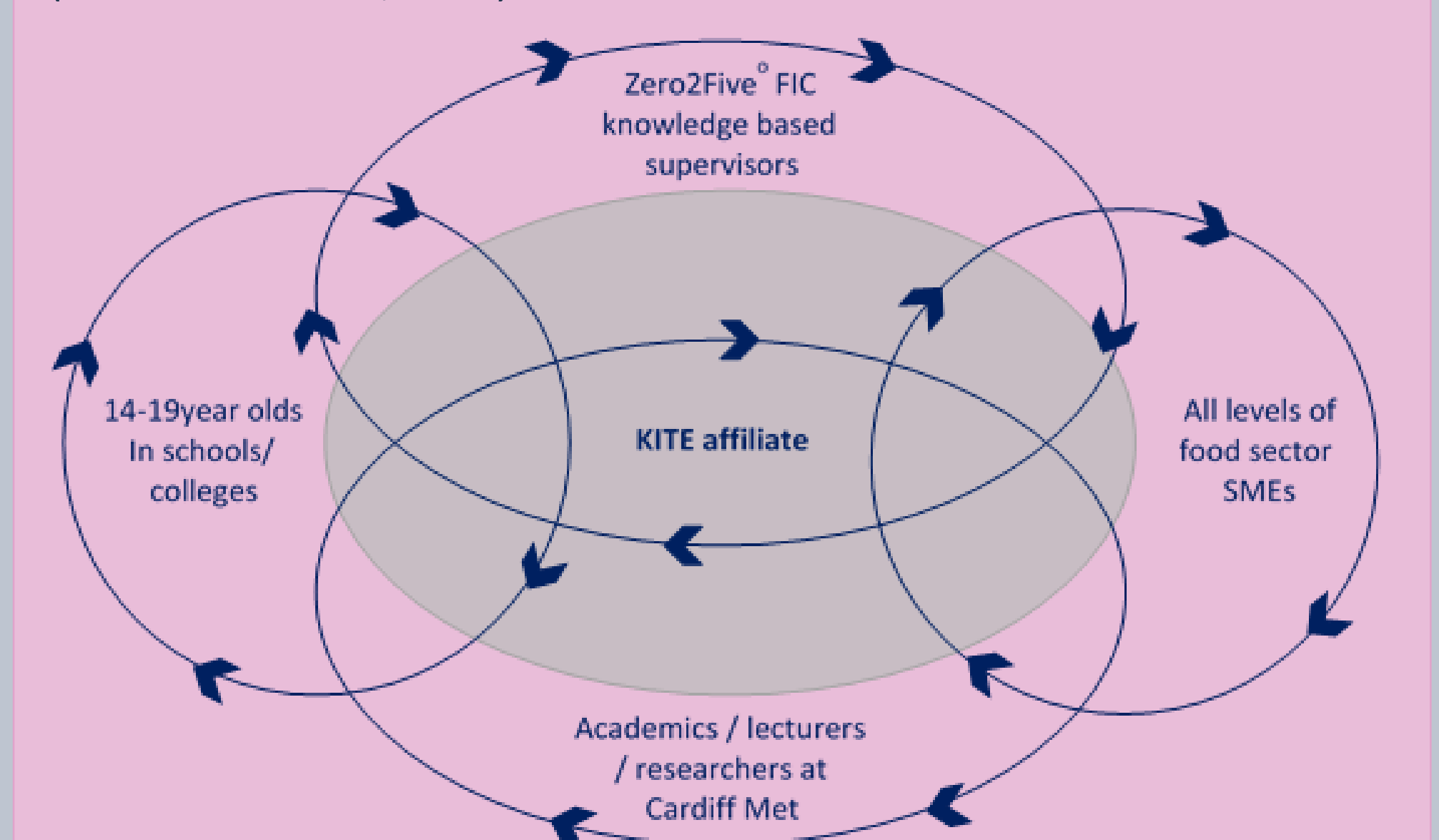
- n=61 affiliates upskilled KITE 2008-2015
- KITE led to development of the HELIX Project (Redmond *et al.* 2019; Mayho *et al.* 2019) which provides 1. Technical diagnostic assessment, 2. Technical / commercial marketing support 3. Graduate knowledge transfer programme



Summary

- Over the past decade, FST and food-safety/technical upskilling has been evidenced in >40% of Welsh small and medium sized enterprises (SMEs). SME technical support has resulted in 76 third-party accreditations and >2770 new and safeguarded jobs (Redmond, 2015).
- 'KITE and Project HELIX' have established technical requirements in 122 SMEs, which have facilitated sustainable business in the longer term as well as retaining FST skills in Wales.
- 'Skills projects' upskilled >200 food-handlers through short-courses and 145 food operatives/ technologists/ managers showed significant improvements in British-Retail-Consortium (BRC) knowledge of traceability, allergens, supplier and raw material approval and sensory analysis.
- The supply of graduates to the food-industry has increased through the online masters (40 postgraduates), through the student-placement-bursary-scheme (9 placements) and a FST Foundation degree (16 completions).

Figure 1 Circulation of food safety and technical knowledge within Cardiff Met, the FIC, KITE affiliates and Welsh food sector SMEs. (Source: Redmond, 2015).



Conclusion

Knowledge-transfer of technical/food-safety expertise to Welsh SMEs in conjunction with educational interventions has enabled advancement in business employment, sustainability and innovation with a stronger, more technically skilled workforce in the Welsh FDMP industry.