

Institution: Cardiff Metropolitan University		
Unit of Assessment: UOA03: Allied Health Professions, Dentistry, Nursing and Pharmacy		
Title of case study: Innovation and improved food safety in the Welsh food sector.		
Period when the underpinning research was undertaken: 2000 - 2011		
Details of staff conducting the underpinning research from the submitting unit:		
Name(s):	Role(s) (e.g. job title):	Period(s) employed by submitting HEI:
Professor David Lloyd	Director of the Food Industry Centre (FIC)	1997 – present
Professor Adrian Peters	Dean, School of Health Sciences	1995 – 2017
Dr Elizabeth Redmond	Senior Research Fellow, FIC	1996 – present
Dr Debbie Clayton	Principal Lecturer, Applied Psychology	2004 – present
Prof Louise Fielding	Professor, Director of Research	1993 – 2013
Prof Chris Griffith	Professor, Head of Food Research Consultancy Unit	1973 – 2009
Leanne Ellis	Research and Affiliates Manager, FIC	2002 - present
Period when the claimed impact occurred: August 2013 – December 2020		
Is this case study continued from a case study submitted in 2014? Yes		
1. Summary of the impact (indicative maximum 100 words)		
<p>With initial funding of £3.9million from the Welsh Government (WG) and European Agricultural Fund for Rural Development (EAFRD), the Knowledge, Innovation, and Technology Exchange (KITE) project has significantly impacted social, health, environmental, employment and sector skills in the Welsh food and drink manufacturing industry; a sector which contributed £7 billion to the Welsh economy in 2019 alone. KITE contributed over £100 million in increased sales and 700 jobs to this critical sector of the economy. Through its support of Welsh small-to-medium sized enterprises (SMEs), KITE has facilitated technical innovation and upskilling, strategic development, and improvement in food production processes resulting in significant growth in: Food safety management and 3rd party certification; food product sales; job creation and retention; product development, innovation and diversification; and, supply chain efficiency. As a result of KITE, an additional grant of £11 million was awarded for Project HELIX, which by 2019 had achieved economic impact of over £110 million.</p>		
2. Underpinning research (indicative maximum 500 words)		
<p>The programme of research that underpins this impact case study has provided an evidence base that has informed Welsh Government (WG) strategy in the food and drink manufacturing and processing (FDMP) industry in Wales for almost 20 years. <i>Conducted through the ZERO2FIVE Food Industry Centre (FIC) at Cardiff Metropolitan University</i>, the research has</p>		

been a catalyst for technical and operational support for safe food manufacturing, food and drink company growth and innovation, and access to new markets. Backed by the WG, and globally recognised for its expertise in food-handler cognition, behavioural change, and food safety culture, the FIC has been at the forefront of research-led advances that have bolstered the food and drink industry through projects such as KITE.

Research that has enabled the FIC to help transform the Welsh food industry has involved the cross-cutting themes of 3rd party certification through technical performance, behavioural change, product development and innovation, and food safety management. To elaborate, FIC research included the largest analysis of the technical performance of Welsh food manufacturers, involving 137 food industry practitioners from 52 SMEs in Wales [R1]. This analysis found that Welsh FDMP businesses had significantly higher levels of critical British Retail Certification (BRC¹¹) non-conformances (particularly in relation to the development and implementation of technical systems essential for safe products) than those reported by global food processors [R2]. The analysis showed that although food handlers were aware of industry food safety requirements, barriers to implementation led to almost two thirds of those who had received food-hygiene training not complying with food safety standards.

Research that interrogated critical features of food safety culture was cemented by a “position statement” [R3], which highlighted the importance of food safety management systems being linked inextricably to organisational food safety culture. Hazard and risk-based quality management and adoption of the Hazard Analysis Critical Control Point system (HACCP) to reduce foodborne illnesses has also been important in informing SME food safety standards and compliance. An assessment of levels of understanding in UK food manufacturing SMEs regarding hazard identification, components of good manufacturing practices and HACCP-related management systems highlighted the problems they faced when undertaking hazard analysis and complying with legislative food safety requirements [R4]. Subsequent research [R5] which examined the effect of an information resource on food safety compliance in 123 SME food businesses reinforced the need for processes such as certification to safeguard food quality to accelerate food sector growth. Meanwhile, the crosscutting theme of innovation was examined in 36 Welsh businesses to assess understanding of, and commitment to innovation and development within food processing. The findings showed a distinct lack of planning for understanding and capability in innovation within the Welsh food-processing sector [R6].

In sum, the research underpinning this impact case study has been a catalyst for projects such as KITE to achieve wide-ranging health and economic benefits from its support of the Welsh food and drink industry.

3. References to the research (indicative maximum of six references)

The underpinning research comprises outputs published in international peer-reviewed journals (R1, R3, R4 and R5) and official Welsh Government funded and commissioned project reports (R2 and R6).

[R1] **Clayton, D., Griffith, C.J., Price, P. & Peters, A.C.** (2002). Food handlers’ beliefs and self-reported practices. *International Journal of Environmental Health*, 12, 25-39. DOI: 10.1080/09603120120110031

[R2] **Lloyd, D., & Simmons, H.** (2005). A study of Welsh food processors’ technical performance (versus food processors globally) using the BRC standard / global food 2005 as the benchmarking tool. Commissioned by the Welsh Assembly Government.

[R3] **Griffith, C.J., Livesey, K.M. & Clayton, D.** (2010). The assessment of food safety culture. *British Food Journal*, 112 (4), 439-456. DOI: 10.1108/00070701011034448.

¹ British Retail Consortium (BRC) certification has changed to British Retail Consortium Global Standards (BRCS) certification

- [R4] **Fielding, L.M., Ellis, L., Beveridge, C. & Peters, A.C.** (2005). An evaluation of HACCP implementation status in UK small and medium enterprises in food manufacturing. *International Journal of Environmental Health Research*, 15 (2), 117–126.
- [R5] **Fielding, L.M., Ellis, L., Clayton, D. & Peters, A.C.** (2011). An evaluation of process specific information resources, aimed at hazard analysis, in Small and Medium Enterprises in food manufacturing. *Food Control*, 22 (8), 1171-1177. DOI: 10.1016/j.foodcont.2011.01.011
- [R6] **Lloyd, D., Griffith, C., Drake, J., Obee, P., William, E., Griffiths, C., Davies, J., & Nicholson, D.** (2006). A study of innovation in the Welsh food manufacturing sector. A draft interim report by Food Network Wales. Commissioned by the Agri-Food Partnership.

4. Details of the impact (indicative maximum 750 words)

The food and drink industry is critical to the Welsh economy, contributing £7 billion to it in 2019. Over the last 10 years the FIC has been integral to the WG achieving its strategic priorities through its support of SMEs. In 2009 the FIC was awarded £3.9million for project KITE to address WG's strategic priorities for Welsh food and drink SMEs, and to contribute to governmental policies on Health, Economy, Education, Environment, Agriculture, and Tourism [E1, E2]. The impact of the project has been considerable, as publicly acknowledged in 2014 and 2015 respectively, when KITE **won the 'Economic Impact Award'** at the Insider Business and Education Partnership Awards [E3] and was **shortlisted for the highly prestigious Research Councils UK Impact Awards** in the Outstanding Knowledge Exchange and Commercialisation category [E4]. In essence, since August 2013² the impact of KITE has been evidenced across: Development of food safety management and culture; improved food science / technology knowledge; attainment of 3rd party certifications; SME sales and growth; increased employment; innovation and new product development (NPD); improved food supply chain efficiencies and sustainability; and, new project funding [E1, E5, E6].

Development of food safety, science and technology

Addressing the critical shortfall in technical industry knowledge and skills, transfer of food safety and technical knowledge has resulted in a stronger, more technically skilled workforce in the Welsh food sector. KITE has also enabled **23 companies** to align their supply chains with global food safety standards by achieving the following independent 3rd party certifications: **12 BRC certifications, 15 SALSA³ certifications, and 5 retail standards** (e.g., Tesco, Sainsbury's, Marks and Spencer) [E1].

Increased SME sales and growth

KITE partner SMEs reported increased sales of **£102.828 million** of Welsh product (through new and existing markets) as a direct result of new product development, improved technical performance and the attainment of 3rd party certification. For example, in 2014, export sales for one SME increased 40% and export of its zero-fat probiotic frozen yogurt extended beyond the core European market to the Middle East, Asia, and Africa. 42% of SME partners achieved increased sales of over £1 million, with one company achieving over £10 million [E1, E2, E5].

Employment

Job creation within the sector is the cornerstone of WG policy. Since 2013 KITE has resulted in **290 jobs being created and 413 safeguarded**. In support of other WG policies, a large proportion (71%) of SME partners are based in **EU convergence areas** - areas with historically high unemployment. There has also been increased employment of science graduates, skilled

² The impact for this Impact Case Study has been derived from the overall impact of the KITE project for the period August 2013 to July 2020.

³ SALSA – Safe and Local Supplier Approval

employment of females aged 18-24 years, and a reversal in the trend of food technology skills moving away from Wales [E1, E2].

Innovation and new product development / launch with major retailers

KITE's support of SMEs has resulted in **642** new food/drink products being developed and launched into leading retailers since 2013, including Tesco, Waitrose, Sainsbury's, Asda, Iceland, Morrisons, Holland and Barratt, Aldi and the Co-op. New products are also being exported to international markets (e.g., Spain, Switzerland and Greece) [E1, E2, E5].

SME supply chain efficiencies and sustainability

KITE has had a significant impact upon supply chain efficiency through developmental streamlining of business processes and procedures. Reduction in supply chain length attained from KITE networking helped SME partners to use local ingredients through local sourcing of food products in Wales. Development of effective production processes combined with a networked chain of food processors (utilising local raw materials) helped Welsh SMEs 'shorten' the food processing chain, **optimising local sustainability** [E1, E5].

Nutrition and health

Health imperatives have been key to many KITE projects, with partners addressing a variety of the nutritional properties of products (e.g., ice cream suitable for people with diabetes, low fat soups) supplied to major retailers such as Tesco and Asda. In 2013 a Welsh Rugby Union nutritionist/Pro-Athlete Supplementation Director developed a high protein soup to aid training recovery [E1, E5].

Awards

Since August 2013 KITE partners have been awarded **9 National and 4 Regional awards** [E1].

Project HELIX

In 2016, KITE's success led to Project HELIX, a 5-year, £21 million programme funded by WG and the European Union Agricultural Fund for Rural Development, in partnership with Food Technology Centre, Anglesey and Food Centre Wales, Ceredigion. FIC's share of the funding was **£11million**. HELIX supports the Welsh food and drink industry through: the safeguarding and creation of new jobs; the development of new and reformulation of existing products; support for innovative ingredient and processing solutions for more diverse and healthier product ranges; improved product quality, integrity, safety, and shelf life; knowledge transfer and training activities to support business and skill development; and, access to new national and international markets. By 2019 it had achieved an economic impact of **over £110 million** – a **423%** return on taxpayer investment [E6, E7].

5. Sources to corroborate the impact (indicative maximum of 10 references)

- [E1] **Redmond, E.** on behalf of the ZERO2FIVE Food Industry Centre, Cardiff Metropolitan University. KITE Evaluation Executive Summary. 2012-2015. Final Evaluation Report submitted to the Welsh Government. The report evidences the impact of KITE across improved food safety, sales, produce development, and health.
- [E2] KITE Report Claims: 24, 25 + 26. Submitted to Welsh Government by FIC, Cardiff Metropolitan University to the Welsh Government on project completion.
- [E3] 'Economic Impact Award' for KITE at the Insider Business and Education Partnership Awards. (November 2014) provides industry verification and acknowledgement of KITE's economic impact.
<https://www.insidermedia.com/event/business-and-education-partnership-awards-2014/coverage>

Impact case study (REF3)

- [E4] Research Councils UK (2015). The Impact Awards for KEC Professionals. Finalist Pack. The award provides further acknowledgement by Research Councils UK of the impact of KITE.
- [E5] KITE Project Impact Company Testimonials to evidence the direct economic impact of KITE on a number of companies.
<https://www.youtube.com/watch?v=cvi89OhdI7o>
<https://www.youtube.com/watch?v=2o2qU1jRk8w&feature=youtu.be>
<https://www.youtube.com/watch?v=opNAvYNk8VY&feature=youtu.be>
<https://www.youtube.com/watch?v=KK5BONEerqY&feature=youtu.be>
- [E6] HELIX Project Launch WG Press Release to evidence Welsh Government investment in and launch of HELIX and its scope.
<http://www.bbc.co.uk/news/uk-wales-39356484>
<http://foodinnovation.wales/news-articles/21-million-food-innovation-project-set-to-safeguard-thousands-of-welsh-jobs/>
- [E7] Helix-FIW-Annual-Report-2019-ENG provides evidence of the initial economic impact of KITE on the food and drink sector.