Dairy Crest Innovation Centre at Harper Adams University: A comprehensive long-term agri-food collaborative relationship

Shropshire, UK

# General Information

Title	Dairy Crest Innovation Centre at Harper Adams University	
Pitch	A comprehensive long-term agri-food collaborative relationship	
Organisations	Dairy Crest and Harper Adams University	
Country	United Kingdom	
Author	Adam Krcal (Technopolis Group UK)	
Nature of interaction	<ul> <li>Collaboration in R&amp;D</li> <li>Commercialisation of R&amp;D results</li> <li>Mobility of staff</li> <li>Academic entrepreneurship</li> <li>Governance</li> </ul>	<ul> <li>□ Lifelong learning</li> <li>☑ Joint curriculum design and delivery</li> <li>☑ Mobility of students</li> <li>□ Student entrepreneurship</li> <li>☑ Shared resources</li> </ul>
Supporting mechanism	<ul> <li>□ Strategic</li> <li>☑ Structural</li> <li>□ Operational</li> <li>□ Policy</li> </ul>	
Summary	Dairy Crest, a leading British dairy company, set up a £4m (€4.8m) innovation centre on the campus of Harper Adams University in Shropshire (England). Starting from the partnership aimed at joint research and development R&D projects between the company and the specialist university, the establishment of the new innovation centre as a shared facility is taking the partnership to a new more comprehensive level. Beyond research, development and innovation (RDI) collaboration, Dairy Crest also helps provide additional busi-	

ness-relevant education and input to the design and delivery of curricula.



### 1. BACKGROUND

Harper Adams University (HAU) in Shropshire, founded in 1901, is the UK's largest specialist higher education institution in the field of agri-food. The university has a long track record of working with companies from the sector (over 500), including farmers and large food manufacturers. In November 2015, they took this relation one step further when Dairy Crest (DC), a leading British dairy company, opened the Dairy Crest Innovation Centre (IC) on the campus of HAU in Edgmond in Shropshire. It is a unique development between a major food business and a university, perhaps the only big partnership in the food processing sector in the UK so far.

Prior to the opening of the IC, there were limited relations between the two partners, mostly around occasional research and student placements at the DC's Technical Development Centre in Crudgington (Shropshire, England). For HAU, it is the second big partnership with the business sector, after establishing one in the field of poultry education and research in 2010.

The partnership between HAU and DC has developed in the context of pre-existing, though more occasional, relations between the two partners. Both partners have had traditional links to the region (Shropshire), which has a historic association with dairy production. HAU is well known and respected for its leading role in food, farming and science education. The IC came at a time when universities and businesses were being increasingly encouraged to work together to support economic growth. In general, university-business collaboration is more important than ever, with higher education striving to deliver research that has 'real-world' impact, and to translate ideas and knowledge from the lab and lecture hall into industry. For DC, building brands and adding new products is fundamental and at the core of their strategy.

### 2. OBJECTIVES AND MOTIVATIONS

There are objectives and motivations for both partners. The common motivation of both partners was to encourage young people looking at their career options to consider the opportunities presented by the food industry.

DC aims to deliver 10% of year-on-year growth through new product development; with scientific research, technology and product development at the core of this objective. They believe that the new IC will contribute substantially to achieving this goal. DC currently sits ahead of all its main rivals at 7%. Another objective for DC was to allow their staff to have quality access to research and academics, which is very important, considering their intention to lead in innovation in the future. In a world where issues of food security and sustainability are now at the top of political and agri-food industry agendas, finding ways to increase interaction and knowledge flow between academia and the food industry for commercial and societal benefits was important for DC, and is going to become increasingly more important. As a result, the focus on innovation is an important point of difference as future growth will be very likely to be underpinned by a focus on scientific research, technology and product development.

In addition, DC aimed at consolidating the majority of their technical and research expertise, and equipment in one place. Although the initial idea did not include relocation to the HAU campus, sharing the campus with the university allows DC to benefit from cross-fertilisation of people and ideas with the university. Therefore, moving their research and technical development activities to the HAU campus as part of this collaboration was a logical step to take.

For HAU, another important objective was to establish a working academic collaboration, which entails more than having a commercial site on the university campus, but actually creating a partnership that would provide mutual benefits. A strong academic component has always been important for HAU when establishing this partnership. As such, HAU aimed at gaining support from DC for the university's curriculum in the form of opportunities for undergraduate students and graduates to apply their skills and knowledge in an industrial setting.

# 3. STAKEHOLDERS

The main stakeholders involved are the research and academic staff, undergraduate students and graduates of HAU, along with the management of both HAU and DC, and wider business and share-holders of DC. However, stakeholders also involve consumers, farmers, the local general public and potential university applicants, for all of whom the partnership is or can be beneficial. The management staff at both partnering organisations have been important since the initial discussions as they approved the necessary investment and resources to be put in the partnership. The HAU academic staff and the DC innovation centre research staff are closely involved in the day-to-day operation of the partnership and they implement most of the common activities.

Students and graduates are a large stakeholder group and have always been at the core of the partnership since it was set up. Students at HAU have access to technical expertise and state-of-the-art facilities on their doorstep, and can also benefit from the valuable experience of working in a commercial environment. This improves their employability prospects after graduation.

As has already been detailed, the benefits to the DC wider business are multiple and will help develop a commercial advantage in the field of research and innovation.

HAU and DC also engage in joint initiatives to target secondary school pupils, providing them with information on a future career in the agri-food sector (see below). Finally, both consumers and farmers can ultimately benefit from innovative products, services and processes that result from the partnership.





### 4. INPUTS

Both partners invested resources to build the IC. DC invested £4m (€4.8m) between 2014 and 2016 to build the IC. In May 2016, DC announced an investment of an additional £2m (€2.4m) for research into the effect of galacto-oligosaccharides (GOS), a prebiotic food ingredient, on animals, to conduct field trials and find new commercial applications for the product. Besides the financial investment, DC moved its research and development staff, who are regular DC employees, to the IC. The IC staff now numbers around 30 employees who were relocated mostly from the Clover (a famous spreadable butter brand in the UK) manufacturing site at Crudgington (Shropshire, England). The IC is used as a base for DC's technical and research and development team. Some staff conduct field research so they are not permanently present at the centre. DC also covers the operating cost of the IC building and take care of necessary maintenance. In order to make the daily operation as efficient as possible, some services are provided by HAU, such as security, catering etc., the cost of which is covered by DC.

HAU, who is the freehold owner of the land on their campus, hosts the IC building, based on a 25year lease agreement. HAU received additional funding of £150,000 (€180,000) from the Higher Education Funding Council for England (HEFCE) Catalyst Fund to help provide essential infrastructure to support the development of the IC new building. HAU also provides research infrastructure, facilities and resources needed for research grant applications, designing research projects etc.

Both partners jointly sponsor a newly established lectureship (see below) and share the cost of joint research projects.

### 5. ACTIVITIES

The partnership between HAU and DC is multi-faceted and includes a range of activities in education and research.

Students and graduates are at the core of the education activities and have access to the technical expertise and state-of-the-art facilities of the IC. The aim of the partnership is to improve students' experiences and add value from the commercial environment. The IC take two students for placements annually, principally in the field of product and packaging innovation. Students on placement spend one year fully integrated into the IC research teams' work. They can try various activities as part of the research, which provides them with a valuable hands-on experience. HAU maintains cooperation with more than 500 companies in order to offer a placement to every undergraduate for their sandwich year. The HAU academic staff, including the Vice-Chancellor, undertakes regular placement visits at the partner companies. These visits help HAU to keep in touch with the companies as it is important for HAU to ensure students get good placement experiences. As 99.4% of the HAU graduates who undertook placements are employed, the second highest in the UK, it is clear the experience is valuable. As such, this is a very successful model of university-business cooperation because the agri-food sector is short of high-quality young graduates. In 2015/2016, HAU had more than 150 companies looking for student placement opportunities.

Another way for the IC to engage with HAU students is through their final-year projects, which students must conduct as part of their Honours Degree. The research staff at the IC prepare a list of project topics and submit it to HAU annually. In 2015/2016, there were five projects supervised jointly by the DC staff at the IC and HAU. This activity brings benefits to HAU, DC and students. Engaging with students this way also allows DC to spot talent and provides opportunities to identify and recruit talented work-ready graduates in the future.

The IC's staff also provide numerous lectures at HAU every year. This is done in close cooperation with HAU academic staff. The process involves initial discussions between the IC staff and the HAU lecturers about the topics. The lectures themselves focus on how to use what students have learned in the real life. The lectures are often delivered by researchers who are only a few years older than the audience, a very interesting element for students. There are several different modules on which the IC has agreed to provide input. Equally, HAU is planning lectures for the IC on either emerging topics or other topics that have been highlighted by the IC.

Furthermore, the IC has started to be involved in curriculum development at HAU. The IC staff participate in the panels responsible for the design of modules and courses, and they provide both informal and formal contributions. The feedback from student placements also contributes to curriculum development.

HAU will be supported by DC and the IC in targeting secondary school students which they both see as important to get young people interested in the food industry. This will involve, for example, summer schools, where the staff of both HAU and the IC participate.

Earlier in 2016, HAU and DC created a new lectureship in Animal Science and Bioinformatics, the aim of which is to help expand the portfolio of research into a prebiotic food ingredient, which has dairy origins, to the animal feeds sector. Funded jointly by HAU and DC, the lectureship will provide DC with a capability and capacity to undertake analysis of data derived from its current research into the use of Galacto-oligosaccharide (GOS) within the animal nutrition sector. The day-to-day arrangements of the lecturer's work also help to maintain the smooth operation of the partnership, for example having two desks, one at HAU and the second at the IC.

There are also joint research projects conducted between HAU and the IC. The aim of both partners is to let the research cooperation evolve organically, based on the emerging topics. All the projects are different and are led by one of the two partners, HAU or DC; however the ownership of the results is agreed upon at the beginning of each project. The working relationship between HAU and DC has developed over time to include, most recently, a project to look at animal welfare. The joint research projects provide HAU academic and research staff with opportunities to experience the commercial environment, but they also give DC a link into leading academic research within the agriculture and food sectors. There is a vision to undertake professional mobility between the partners and provide, for example, short staff secondments.

### 6. OUTPUTS

There are several both expected, and already achieved, outputs from the partnership as the IC opens up new opportunities for both parties to work together and support the development of future technical professionals for the food industry.

For DC, the partnership provides increased access to food and farming research and helps them continue to develop new products and ways of working. In the financial year 2015/2016, the IC helped DC achieve these outputs:

Successful re-launch of Clover with no artificial ingredients;

- Development of Cathedral City Spreadable Cheese range (Mature, Extra Mature, Lighter and Garlic and Herb); and
- Validation and optimisation of GOS manufacturing process.

The expected outputs from the additional £2m (€2.4m) investment in 2016 are the following:

- Validation of laboratory findings with field trials; and
- Additional commercial applications for GOS.

For HAU, the partnership has already delivered two successful student placements (of 12 months each), with another two students undertaking placements at present. In addition, five HAU undergraduate students worked at the IC on their final-year projects in 2015/2016 and new projects are to come this academic year. The successful appointment of the lecturer in Animal Science and Bionformatics, jointly sponsored by HAU and the IC is, another output from the partnership.

Joint research projects are a different important strand of activities within the IC. The expected output from these projects in the future predominantly concerns new technical insights for DC and identification of new growth areas. For HAU, these projects might potentially deliver some high-quality scientific research outputs that can be submitted as the university's results to the UK's Research Excellence Framework (REF). The output already materialised in research is the established cooperation between the HAU's and the IC's research teams, now working together on daily basis with a high level of interaction. Currently, the partnership has not generated any patents or licences although there is an intention to do so in the future, especially in the light of the UK tax advantages for conducting research in private companies.



### 7. IMPACTS

Although the partnership between HAU and the IC started in 2014, the IC opened only in November 2015. Therefore, it is soon to spot any long-term impacts of the partnership. Both partners are very satisfied with the progress so far, claiming that the mutual relationship has started extremely well, with increased creativity at the forefront of the success.

Perhaps the most apparent impact can be observed on students. As a result of her 2014/2015 placement, one graduate has been offered a full-time job at the IC. Students' testimonials show that they are happy with the placements at the IC and find this experience extremely valuable, giving them real hands-on experience from a workplace in a big commercial company. Being able to work on products for a retailer or major brand is an exciting opportunity and it gives them a better understanding of new product development.

Although long-term impact in joint research activities is yet to come, including some possible research outputs submitted to the Research Excellence Framework (a system assessing research quality of UK HEIs), both partners are very optimistic in this regard. There are already signs at HAU that the IC has shifted the focus of their research, for example in livestock farming. HAU has already started to build on this partnership and one hub of the brand-new Engineering and Precision Farming Innovation Centre (Agri-EPI), which is government-funded, is now being built in physical proximity to the IC. The Centre will involve 70 companies and three universities.

DC reached in 2015/2016 its annual target as 11% of their sales came from recent innovation across their four key brands. The IC has managed to re-energise DC's productive activities in food and dairy product innovation and creativity.

The partnership has sent a signal to the whole agri-food sector. As both HAU and DC have a prominent place in the UK agri-food sector, the partnership clearly sets a visible example for other players in the UK and beyond. It has raised the profile of the whole food sector. Furthermore, the partnership has strengthened and created new links between primary production (agriculture) and the food sector, allowing collaboration to move up and down the production chain.

There has also been an impact on the region (Shropshire, Staffordshire and the Midlands in general). Integrating the IC in the campus has preserved jobs and business opportunities in the region and retained valuable knowledge in Shropshire. The staff at the IC have established a community committee, through which volunteering employees engage with the local communities and children.

# Support & Influencing factors

# 8. SUPPORTING MECHANISMS

The underpinning legal document for the partnership is the Development / Collaboration Agreement concluded between HAU and DC on 3 October 2014. DC agreed to develop the IC on the university's campus and HAU agreed to provide a leasehold of the land within the campus. The partnership is contracted for 25 years. In addition to the lease of premises and land, HAU and DC have entered a knowledge collaboration agreement to further strengthen their links.

Although the Development / Collaboration Agreement makes provision for the collaboration in research, both partners want the joint activities to grow and develop organically. Furthermore, there is a specific contract concluded at the beginning of each individual joint research project.

What is probably even more important than the legal mechanisms, is the need for a common vision on the side of both partners and the mutual trust that the partnership has created is a win-win for both.

In terms of financial provisions, DC covers the operating cost of the IC building and they take care of the necessary maintenance. Both partners jointly sponsor the lectureship (see above).

Based on the HAU curricula, every student at HAU, both at foundation and honours degree levels, is required to spend a year in employment, so the university has links with some 500 businesses to manage the placement process. This mechanism enables the IC to take HAU students on one-year placements during their sandwich year.



### 9. BARRIERS AND DRIVERS

For both HAU and DC, one of the most important drivers was to make sure there are enough graduates for the food industry, with the right knowledge and skills. In addition, both partners were driven by a wish to develop a relationship that would be more than just collaboration, but one that would grow and develop gradually. To this end, the physical presence of the IC at the HAU's is definitely driving the partnership forward. Another important driver for DC was to deliver innovation (and thus contribute to reaching the company's business targets). DC realised that the more one wants to look at innovation, the need to be closer to the academia gets more important. There is a passion at DC to build and further develop in-house knowledge and to change the culture of innovation. People are always an important and critical driver, and there is a high level of commitment needed for the partnership to work well. So far, there have not been many barriers identified by the partners as the partnership is regarded to be working well. At the beginning of the partnership, when the teams did not know each other very well, the negotiations about the partnership's features went slower so the dialogue had to be promoted. However, once the relations were established, it was no longer an issue. Perhaps the most significant potential barrier is the university's ability to secure sufficient external funding, especially for research projects. In the light of the reduction in national government research funding, such as funding by Research Councils UK, and as a result of uncertainty around EU research funding, the IC might face a challenge in the future.

Therefore, securing external funding, especially for joint research activities is the main challenge ahead. The need for investment of money and time upfront is another challenge of big projects like the IC. It is necessary to build the relationships and get the whole partnership to work. It is essential that people are committed to working together and that there are sufficient resources to develop the partnership. Furthermore, good project management is critical. Negotiations, discussions and planning, all must be done well ahead of time. This proved to work really well in the case of the IC. HAU and DC both have teams of project managers that helped each other during the IC development. Throughout the whole process, it has been essential that both partners understand that it is a winwin solution for everyone.

Finally, planning and thinking about a future period, for example about the five years ahead, is another challenging task. As the whole relationship is currently moving ahead at a very quick pace, it is important to start thinking about the future steps and development opportunities.

### **10. KEY SUCCESS FACTORS**

The success of partnerships like this one always critically depends on universities finding commercial partners with an appetite for genuine collaboration. It is essential to find a research field and research topics that fit both partners.

People are critical to the success. As mentioned before, networking activities, icebreaking events and personal commitment are all needed for the partnership to run smoothly.

Furthermore, a common vision that the partnership can thrive, work well and deliver results is needed. In the case of the IC, the multi-modal character of the partnership is another key success factor, i.e. the connection between a university and a company that is able to support students in their career development, to support curriculum development and also to contribute to innovation in the agri-food sector.



### **11. MONITORING AND EVALUATION**

There are two levels of monitoring and evaluation of the partnership, a day-to-day level and highlevel quarterly meetings. At the day-to-day level, researchers interact regularly and the heads of research teams meet regularly every two months to discuss the progress, future ideas, identify problems etc.

At the high-level, there are quarterly review meetings, attended by the Group Commercial Director and Head of R&D from DC and by the Director of Finance and Head of Department of Food Science and Agri-Food Supply Chain Management from HAU.

In terms of monitoring indicators, for DC, the most important one is to ensure that they deliver 10% of year-on-year growth through new product development. This is monitored annually and only innovation from the last three years is counted. HAU must achieve the performance targets set up in the contract with HEFCE (Catalyst) funding, for which a set of performance indicators has been designed. This is reviewed regularly by the university board.

### **12. SUSTAINABILITY MEASURES**

There are some basic sustainability provisions outlined in the Development / Collaboration Agreement. DC is committed to delivering innovation as it is one of their key areas. HAU have committed themselves to a certain level of student recruitment as a result of the HEFCE catalyst funding.

### **13. TRANSFERABILITY**

The partnership is quite unique as both partners have a genuine interest in the agri-food field. In fact, it represented two different parts of the agri-food system working together. However, there are no apparent reasons why this model cannot be transferred somewhere else, in this sector or a different specialised university with a company in that field. The partnership is also an excellent opportunity for spotting graduate talent and could be used as a model by other agri-food companies.

### **14. AWARDS AND RECOGNITION**

The collaborative partnership between HAU and DC has been awarded the 'Most Innovative Contribution to Business-University Collaboration' category in the Times Higher Education (THE) Awards 2016. The award recognises the embeddedness of DC researchers in HAU as an effective method to develop a pioneering knowledge sharing partnership in an industry with traditionally low R&D.

The IC has also been highlighted in the regional strategy (The Marches Local Enterprise Partnership) as a unique collaboration that places the region at the forefront of innovation in British food.

## **15. PUBLICATIONS AND ARTICLES**

There are no publications as a result of the partnership yet. However, both partners are very optimistic that this is going to come in the future, including perhaps some high-quality scientific research outputs that will ultimately be submitted to the REF.

# 16. LINKS

There is no dedicated website to the partnership or to the IC.

The UK Government's blog on Agri-Tech Strategy <u>https://agritech.blog.gov.uk/2016/02/11/centres-for-agricultural-innovation-launching-in-2016/</u>

The Marches Local Enterprise Partnership <u>http://www.marcheslep.org.uk/invest/whos-here/food-</u> <u>drink/</u>

The testimonial of a HAU student that has recently undertaken a placement at the IC <u>http://www.3point7m.com/profile.cfm?id=201178</u>

The reference to the IC on the HEFCE website is at <u>http://www.hefce.ac.uk/funding/catalyst/projects/Harperdairy/</u>

# **17. CONTACT PERSONS**

Dr. David Llewellyn, Vice-Chancellor, Harper Adams University, dllewellyn@harper-adams.ac.uk, +44 (0) 1952 815275



Mrs Fiona Phillips, Head of Research and Development, Dairy Crest Limited, fiona.phillips@dairycrest.co.uk, +44 (0) 777 195 5567