

Strategies for agricultural growth

FERMENTAS: BOOSTING GROWTH THROUGH SMART SPECIALISATION

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Abstract

Fermentas is a newly formalised industry cluster, tasked by Food Innovation Australia Ltd to drive industry growth by applying a smart specialisation focus to the skilled production of high-quality fermented food, drink and other products. The Fermentas concept is a world first in terms of exploring the potential of fermentation as a value-add to a region. Fermentas has been established to provide an inspirational physical and intellectual environment to facilitate the development and growth of globally-recognised and world-class businesses. Tasmania's unique offerings, collaborative entrepreneurs, world-class primary produce, environmental assets and 'islandness' provide a unique moment in which to develop a focussed 'triple helix' partnership between industry, university and government – adding value through the targeted pooling of resources. By explicitly supporting and promoting collaboration between fermenting enterprises, allied industries, trainers, educators, researchers and government agencies – regionally, nationally and internationally – Fermentas is championing increased innovation, productivity and competitiveness: not by producing more, but by producing differently.

Keywords: fermentation, smart specialisation, regional development

Background

What would it take for Tasmania to be recognised internationally as a centre for excellence in the design, production and marketing of fine fermented food and drinks and other products?

Over the past four years, a group of industry professionals, researchers and government agencies have developed and implemented a concept designed to capitalise on Tasmania's growing reputation as a producer of world-class food and drink, and to focus this concept on a key value proposition: the skilled application of fermentation.

The concept arose from the observation that many of Tasmania's existing and new food and drink businesses were based on the production of value-added product using the skilled application of microbial fermentation. Catalysed by a comment in a UTAS Centre for Food Innovation consultancy report, industry champions started developing and socialising the idea of establishing a world-class, fermentation focussed centre for excellence in Tasmania. As the idea developed and gained momentum, a substantial pro bono contribution by industry members was supplemented by targeted financial input from Northern Tasmania Development Corporation, the Tasmania Office of the Coordinator General, UTAS, the International Specialised Skills Institute and the federal government. This support allowed Fermentas to conduct a series of increasingly detailed industry needs analyses, undertake an international study tour and develop an initial business development plan.

From this consultation and development phase arose a plan to establish an industry-led, fermentation-focussed industry cluster. While the industry cluster model being championed by Fermentas's main supporter, Food Innovation Australia Ltd, is well accepted around the globe, the Fermentas model – focussing on regional economic development through a fermentation lens – appears to be a world first. Other centres around the world have foci on, for example, beer or wine or fermented drinks or cheese. But Fermentas appears to be the first to embrace the spectrum of fermented food and drink production, including the use of fermentation to extract energy from agri-food waste products.

A definition may be helpful. Fermentation is a transformative process in which microorganisms (bacteria, yeast and fungi) turn sugars into food acids, carbon dioxide and alcohol. Fermentation can occur naturally or using a starting culture, it preserves food, enhances flavours and has health benefits. Humans have been doing it for centuries.

The Fermentas proposition is that, *together*, industry, academia, government and communities can establish a world-class fermentation-focussed centre for excellence that:

- provides the space and facilities for development of new products

- facilitates research and development to benefit industries
- coordinates the design and delivery of training in fermentation principles and practices, and
- promotes consumer education, short courses and other experiences as a tourist drawcard.

The rationale behind this concept is that Tasmania increasingly is being recognised as the island home of premium agrifood products and world class, value added food and drink. This reputation, alongside the increasing global understanding of the health benefits to be derived from consuming fermented food products, provides assets that could and should be exploited to help boost a sustainable Tasmanian sector in food manufacture, value adding and tourism.

And alongside the agri-food specialisation sits the demand, and therefore opportunity, for innovation and excellence in allied disciplines integral to the global competitiveness of Tasmania's fermentation sector: e.g. manufacturing, data capture and management, logistics (including packaging), health (including nutraceuticals) and resources and energy sectors.

Fermentas as 'smart specialisation'

The Fermentas project is a prime example of smart specialisation: an approach that offers to reinforce and support natural competitive advantages with targeted policies and activities. Smart specialisation establishes a framework for regional economic transformation by i) identifying regional competencies and ii) seeking new areas of opportunity based on these competencies. It is based on an OECD model¹ and has been implemented widely across the European Union.

In its essence, smart specialisation projects focus on increasing innovation-driven growth. They differ from traditional industrial and innovation projects mainly because they incorporate a process defined as "entrepreneurial discovery": an interactive process in which i) market forces and the private sector are discovering and producing information about new activities and ii) the government assesses the outcomes and empowers those

¹ <http://www.oecd.org/sti/inno/smartspecialisation.htm>

actors most capable of realising the potential. Hence, smart specialisation strategies are much more bottom-up than traditional industrial policies.

In his landmark study from the early 1990's, Michael Porter² sought to understand why firms based in particular locations succeed in global competition, where similar firms in other locations fail. Porter's main conclusion was that "*A nation's competitiveness depends on its capacity to innovate and upgrade. Companies gain advantage against the world's best competitors because of pressure and challenge. They benefit from having strong domestic rivals, aggressive home-based suppliers, and demanding local customers*". In short, a competitive country needs robust sectors in which domestic suppliers, manufacturers and customers are competing and thriving. This thesis has been found largely to hold true at both national and regional levels, leading many countries and regions increasingly to adopt policies that support business ecosystems of this nature.

Regionally-based, smart specialisation initiatives are often given life through the formation of targeted industry clusters. The cluster framework has been recognised as having great potential as a means of regional development and has been widely adopted in Europe³. More recently, Food Innovation Australia Ltd (FIAL; <https://fial.com.au/cluster-programme>) have been championing the need to support cluster development in Australia, including through substantial financial support for Fermentas, the Food and Agri-business Network (<https://foodagribusiness.org.au/>) and the East Gippsland Food Cluster (<http://www.eastgippslandfoodcluster.com.au/>).

With its focus on boosting Australian agri-food exports, FIAL has recognised that globally competitive companies are increasingly defined by their ability to draw together the skills of multi-location, multi-disciplinary teams, using technologies to capture customers' needs and transform them into products and related services. This requires an understanding not only about products but also about the full suite of activities from the concept, research and development and design stages all the way through to post-sale services. It is about adding value to the production line, and it is very much about securing a place in the global value chain.

In his "Cluster Development Handbook", leading cluster development practitioner Ifor Ffowkes-Williams⁴ states: "*Today's economy is about speed, flexibility and connectivity*

² <https://hbr.org/1990/03/the-competitive-advantage-of-nations>

³ <https://www.clustercollaboration.eu/home>

⁴ <https://www.clusternavigators.com>

in an environment where innovation and economic growth are geographically concentrated. Clusters and smart specialisations are cornerstones of this reality.

The focus for economic development is shifting from the national level, shifting from support to industries and to individual firms. Today the emphasis is on the development of regions and their clusters. This bottom-up approach reflects that while companies may come and go, strong and evolving clusters provide economic stability to a region.

Though clusters are a natural occurrence, the development of clusters does not need to be left to chance. Over the last two decades, cluster development has become a mainstream framework for regional development, especially across Europe, providing a centre stage strategy that addresses innovation, productivity and competitiveness.”

Simply put, smart specialisation, enacted through the cluster model, is a considered act of selecting a regionally-based sector with a strong, even unique, value proposition and applying theory and hard work to building the trusted networks, knowledge and infrastructure so that the enterprises at the heart of the sector are able to form, grow and prosper in what is an increasingly competitive and global market.

The risk of not pursuing this goal for a sector with acknowledged potential, is to have the market go elsewhere for the goods and services that might otherwise have been produced in that region.

And that’s where the drive to establish Fermentas came in.

How Tasmania is placed

Tasmania has a global reputation as a producer of the finest quality food and beverages. We have a maritime climate; we have the world’s purest air and water; we have deep, rich fertile soils; our agriculture is clean, green and clever. We are attracting new ideas, new investment, new entrepreneurs and our traditional food producers are diversifying.

Tasmania’s unique offerings, collaborative entrepreneurs, world-class primary produce, environmental assets and ‘islandness’ provide a unique moment in which to develop a focussed ‘triple helix’ partnership between industry, university and government – adding value through the targeted pooling of resources.

Tasmania’s food and agricultural products sector is already internationally oriented, and it is well suited to take advantage of these trends. Tasmania has well-managed food production and biosecurity systems, and a positive reputation for food safety. Our

economy benefits from the positive association foreign consumers link to Tasmania (as a place, its people and its lifestyle). In addition, technological advances are enabling sustainable exports and brand development at smaller scales, suiting a broader range of Tasmanian producers and brand owners.

Naturally fermented foods are getting serious attention these days. Fermented foods are preserved using an age-old process that not only boosts the food's shelf life and nutritional value, but also can give your body a dose of healthy probiotics, which are live microorganisms crucial to healthy digestion.

Tasmania's reputation, alongside the increasing global understanding of the health benefits to be derived from consuming fermented food products, provides assets that could and should be exploited to help boost a sustainable Tasmanian sector in food manufacture, value-adding and tourism.

While the end products of the fermentation value chain are easy to contemplate, there are other vital assets that may not spring immediately to mind. For example, the emergence of smart packaging that can improve product shelf life is something of great interest to researchers at the UTAS Centre for Food Innovation⁵. Similarly, companies established to help capture, manage and mine data (e.g. production, market, logistics) provide multiple applications across sectors (e.g. Delphinium Technologies⁶ ; The Yield⁷), and will be essential to supporting our competitive success in global markets. Such enterprises now have multiple applications across many industry sectors, acting as 'disrupters' and transforming traditional 'single sector' focused manufacturing practices: creating opportunities for SMEs to promote their capabilities and applications across multiple industry sectors and markets

And moving beyond food and drink, there is a rapidly growing market for other fermentation products, including industrial alcohols, amino acids, organic acids, biogas, polymers, vitamins, antibiotics and industrial enzymes. A recent report states that the global fermentation products market was valued at \$149,469 million in 2016, and is projected to reach at \$205,465 million by 2023, growing at a CAGR of 4.7% from 2017 to 2023⁸.

⁵ <http://www.utas.edu.au/profiles/staff/tia/roger-stanley>

⁶ <https://www.definium.net/>

⁷ <https://www.theyield.com/>

⁸ <https://www.alliedmarketresearch.com/fermentation-products-market>

The Fermentas concept and role

The Fermentas concept is a world first in terms of exploring the potential of fermentation as a value-add to a region. Fermentas has been established to provide an inspirational physical and intellectual cluster environment to facilitate the development and growth of globally recognised and world-class businesses that are based on the skilled application of fermentation.

Using the smart specialisation framework, Fermentas is facilitating a flexible and adaptive working relationship between industry, researchers and government (the collaborative “triple helix” at the heart of every successful cluster) to help new fermenting businesses start, to help existing business grow and to build Tasmania’s reputation as a global centre for excellence of fermentation-focussed production, marketing, research and training.

Our stakeholders have told us that their priorities for Fermentas’s attention are:

Product Development

- Access to facilities that would allow physical separation of product development work from commercial operations
- Access to technical information, knowledge and expertise that would assist with design and development of new products
- Access to information, knowledge and expertise regarding the product development process and product lifecycles

Research and Development

- Practical knowledge and understanding of commercial-scale fermentation processes mediated by indigenous and commercially available yeasts and bacteria
- Practical knowledge and understanding of the influence of orchard/crop management and cultivar on fermentation processes and product outcomes
- Deepening understanding of the human health implications of dietary inclusion of fermented foodstuffs (e.g. miso, sauerkraut, sourdough bread, kefir)

Skills, Education and Training

- Access to formal and informal capacity-building opportunities targeted at the needs of Tasmanian fermentation businesses
- Provision of relevant (i.e. topics and delivery mechanism/s) business and marketing units and courses

- Access to a visiting technical expert program
- Access to an industry mentor program

Agrifood Tourism

- Facilitation of collaborative efforts between businesses
- Promotion of ‘real’ experiences for consumers and food tourists
- Access to facilities and support for producers to run their own courses

‘Other’

- Access to thought and advocacy leadership
- Support to mitigate quality-related reputational risk
- Facilitation of a broad community of producers

Alongside this distillation of stakeholder perceptions was a consistent call for thought leadership and provision of a united voice to government and regulatory stakeholders.

Fermentas’s role, therefore, is to provide the leadership and inspiration for this burgeoning industry to grow. We will do this through three focus areas:

The Networks

Successful clusters are all about people, and carefully curated events to bring people together, to allow ideas to meet and sparks to fly. We are building our network of ‘triple helix’ partners regionally, nationally and globally to embrace the ‘enabling’ communities of entrepreneurs, science and technology, infrastructure, policy, accessible venture finance, universities and research and training institutions.

The Know-how

We’ve been told clearly that our industry members want more opportunities to learn – formally, informally, on- and off-site. We will develop and facilitate a suite of courses/workshops/seminars (e.g. technical, business, marketing, experiential) for industry members, researchers and enthusiastic amateurs alike. These will be delivered based on demand, will be hosted in ways that make it easy and attractive for industry members to attend and for all participants to get to know each other, to build relationships and facilitate the development of new ideas.

The Sandpit

Fermentas's infrastructural centre-piece – planned for completion in the next 3 years or so – will be a world-class product development, pilot production and retail facility to support:

- small-to-pilot scale (up to, say, 2,000 L) commercial production and packaging, in which enterprises will be hosted until around their first commercial production run
- assistance in scaling up from new product development to commercial quantities
- chemical, physical and microbiological analyses
- sensory assessments
- research and product development projects
- hands-on demonstrations and courses, and
- retail sales of Tasmanian fermented products.

We see the Sandpit as a core requirement for industry development – providing fermenters and other food entrepreneurs with technical and facility support so they can test their ideas before the need to invest heavily in their own stainless steel.

The key inputs and outputs from the Fermentas model can be visualised as shown in Figure 1.

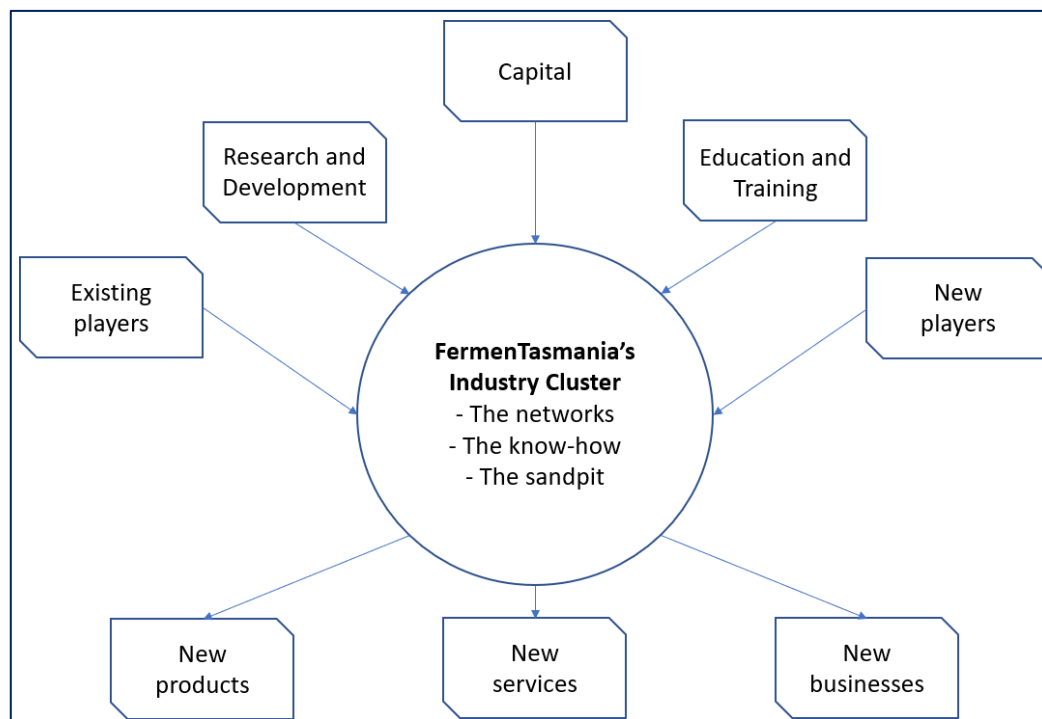


Figure 1: The Fermentas activity platform

Our vision is that – through direct involvement in Fermentas – industry, academia and government agencies *together* will execute this opportunity for Tasmania to reach its potential as a go-to region of excellence for the design, production and marketing of fine fermented food and drinks and other, more industrial, fermentation products. Successful execution of this vision will return substantial benefits to all project partners:

- Industry will build technical and business capacity and capability that will turn ideas into micro businesses and micro businesses into small and medium enterprises.
- UTAS will develop its reputation as a leading research agency and educational provider for fermentation and related technologies.
- TasTAFE will be able to offer new career opportunities to our emerging workforce and private RTOs will be encouraged to do the same.
- The Tasmanian government will see increased regional economic activity and employment in a sector that aligns perfectly with Tasmania's Sustainable Agri-Food Plan 2016–2018 and the Tasmanian Visitor Economy Strategy 2015–2020: support for the growth and diversification of the fermentation industry will naturally increase Tasmania's ability to attract visitors to our State and its regions.

Fermentas is building services and facilitation along the entire value chain to support a broadening culture of technical and business excellence among Tasmanian and national fermenters. We will do this by providing world-class infrastructure and engagement with global and local experts, through which agri-food enterprises can develop new products, engage with research and development projects and participate in courses and workshops that will increase their technical and business skills.

The smart specialisation focus on fermentation represents a real opportunity for Tasmania, weaving imaginative value-adding through the natural and human resources with which Tasmania's agri-food sector been blessed. Rather than ploughing our agricultural seconds back into the ground, we should be transforming them into value-added fermented vegetables and pickles for global markets.

Our core activities in the first few years will be very people focussed – all with the aim of facilitating the formation of new value-adding businesses and the growth and development of existing ones.

For example:

- We will invite local and overseas experts to bring new ideas and ways of working to our regions through networking events and one-on-one site visits alike
- We have a suite of technical, business and marketing training providers lined up to deliver industry-relevant courses and training
- We are working closely with the University of Tasmania and other research organisations to build stronger linkages between fermenting enterprises and industry-focussed researchers
- We are developing a mentor program to bring wise heads to bear on the opportunities and threats being faced by new entrepreneurs

Alongside this work, we will be designing and building the Sandpit to be an inspirational place in which people can meet, dream, design and develop new ideas, products and businesses.

So what?

Fermentas was established to be a transformative catalyst to drive a step change for Tasmanian agri-food enterprises, using the smart specialisation concept to:

- prioritise Tasmania's unique strength in the production of fine fermented food and drink (including: bread, beer, ginger beer, cider, kefir, kimchi, kombucha, mead, miso, natto, sake, tempeh, yoghurt, sauerkraut, spirits, vinegar, wine)
- support and grow the sector
- promote entrepreneurship, and
- identify areas that have potential to employ people.

For the Fermentas project to be deemed a success over our first few years, the following indicative outcomes are needed:

- The establishment of five new enterprises
- The significant growth of ten existing enterprises
- Co-location of five fermentation business alongside the Sandpit
- The development of twenty new food, drink and technical tourism products
- The enrolment of twenty fermentation Associate Degree students at UTAS.

In conclusion, Fermentas's activities are in step with the State government's plan to grow the value of Tasmania's agricultural sector tenfold to AUD\$10 billion per year by 2050⁹. With the support of Food Innovation Australia Ltd and our fellow agri-food clusters, Fermentas is bringing a new way of working to Tasmania's and Australia's agri-food sector. We are focussing on using the power of smart specialisation – triple-helix collaboration, networks, industry-ready skills development and the willingness of entrepreneurs to adopt a co-opetition¹⁰ mindset – to grow the value of the agri-food sector in regional Australia: not by producing more, but by producing differently.

⁹ <https://dpiwwe.tas.gov.au/agriculture/tasmanias-agri-food-plan-2016-2018>

¹⁰ [Link](#) to PDF slide deck describing co-opetition and clusters