HOW DESIGN TRANSFORMS BUSINESS



FOOD AND AGRIBUSINESS SECTOR

CASE STUDY 5

Natural Evolution

QLD

AUSTRALIAN DESIGN COUNCIL

FIAL
The Food and Agribusiness Growth Centre

How Design Transforms Business is the inaugural program launched by the Australian Design Council, to show how design can deliver growth, and in turn, national prosperity.

THE PROGRAM CONSISTS OF:



A Series of Case Studies

Profiling Australian businesses who have used a design-led mindset and practices to grow their business.



A Roundtable

Discussing how this business success could be scaled at a sector/industry level.



A National Design Challenge

The first of its kind, it will look at one major ‘opportunity’ for future national growth, and bring Australia’s world class design profession together, with business, to explore design-led opportunities for prosperity and growth.

There is a world-class design capability in Australia that is not being leveraged to its full potential. While some businesses are using design as a competitive advantage, many still don’t understand how to embed it as a strategic tool to grow and prosper. We believe this is Australia’s missed opportunity.

We hope this program will demonstrate how a design-led process can help.

In partnership with the Food and Agribusiness Growth Centre who trade as Food Innovation Australia Limited (FIAL), we will be focusing initially on the Food and Agribusiness Sector.

It has been selected based on its potential for growth from a A$61bn to a A$200bn sector by 2030.

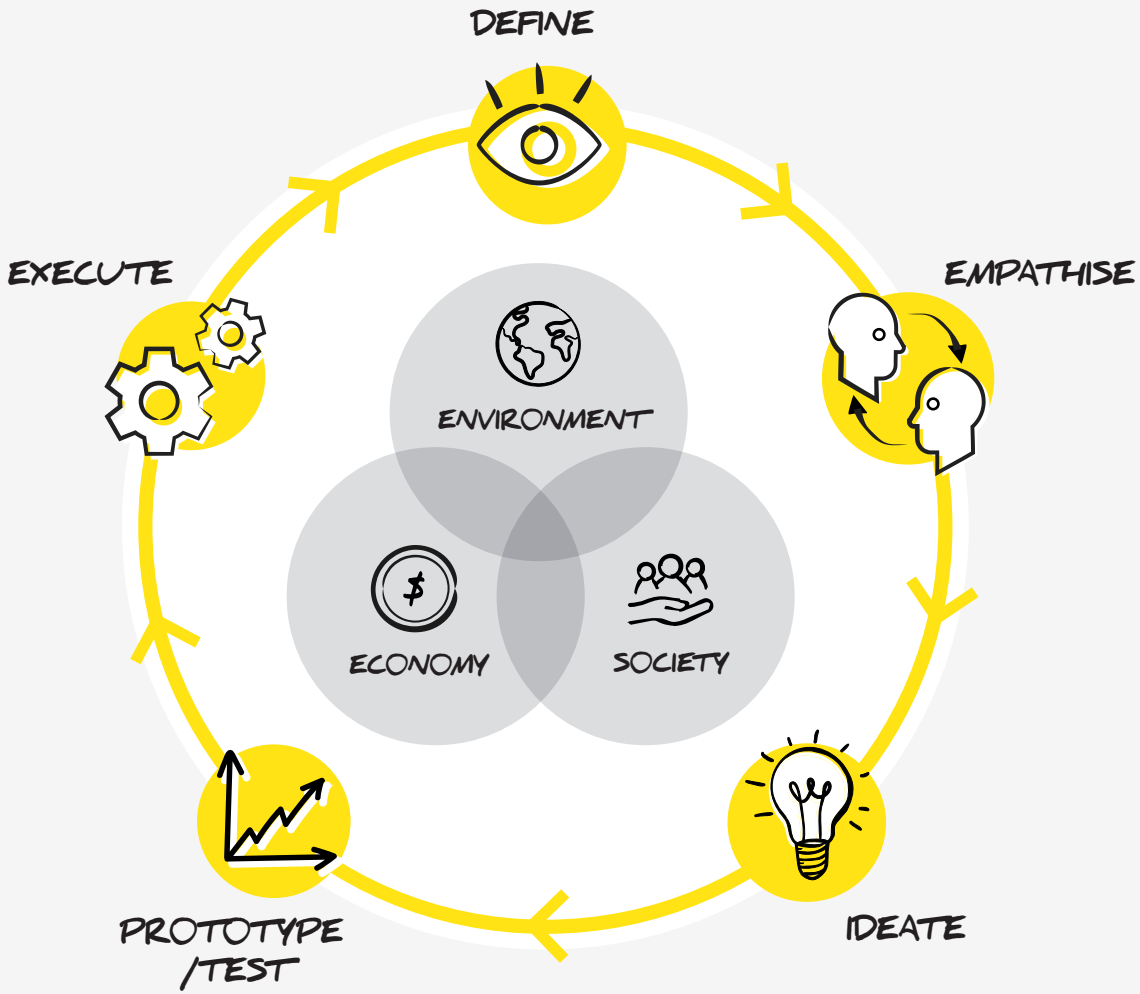
Food and Beverage Manufacturing, the post-farm gate activities of the sector, is one of six National Manufacturing Priorities in the Federal Government’s Modern Manufacturing Strategy.

WHAT DO WE MEAN BY DESIGN?

DESIGN IS A PROCESS THAT LEADS TO BUSINESS GROWTH AND NATIONAL PROSPERITY.

Design is an iterative process for creative problem solving. It is the activity of conceiving and developing a plan for a new or significantly improved product, service or system that will meet a user's needs. It considers economic, environmental and social impact.

We know businesses that use design, gain competitive advantage. Investment in professional design improves profitability, drives exports, jobs and much more.



This process typically happens several times throughout a project as ideas are checked and rechecked against the original defined problem and customer group.

NATURAL EVOLUTION

Natural Evolution is run by the Watkins family who are second-generation banana farmers. It produces a range of health and beauty products made from banana waste.

It is the world's first and only certified producer of green banana flour – a gluten and dairy-free alternative to traditional wheat flours, and green banana resistant starch. The starch contains the richest form of prebiotic resistant starch properties available in the world and bring a variety of health benefits.

Using a design-led mindset and practices, it has enjoyed considerable success.

This Case Study unpacks how they did it and the results achieved to date.

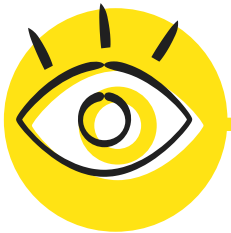
Their journey, as told by Co-owner Krista Watkins, in an interview, has been mapped against a generic Design Process model.



THE BUSINESS CHALLENGE

Too many bananas were going to waste, and cyclones wiped out our income. We thought that if we can find a way to sell *every single part* of what we were growing, regardless of supermarket specifications, and if there was an industry option to make use of everything that was grown every week, financially we would all be in a much better position.

Krista Watkins
Co-owner, Natural Evolution



DEFINE

Ensure the right problem is being solved and then solving it in the best way possible.

"There is a huge banana waste problem. Every week, here in north Queensland, around 2.5 million bananas are wasted because of oversupply or crops not matching supermarket standards.

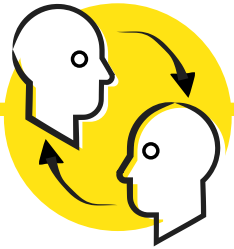
As banana farmers, it was demoralising seeing all your hard work go to waste – literally. Not just for us, but for other farmers too. And when cyclones came along, income was wiped out virtually overnight. We endured two! This wasn't a sustainable way of making a living.

We knew we had to innovate in some way, and it was after accidentally driving over a hand of green bananas and noticing the puff of flour-like powder, that ideas started to form.

We'd noticed too that wallabies and cattle on the farm were stepping over the ripe bananas to get to the green bananas. We hypothesised that green bananas might deliver nutritional benefits.

We began making green banana flour by hand and as demand grew, with numerous customers telling us they not only found it delicious but felt healthier too, we recognised the opportunity to scale.

But how and to who, exactly? And was there really something in this banana flour that was bringing curative effects for people?"





EMPATHISE

Make sure you understand the needs, wants and desires of your customer or end-user at the deepest level possible to ensure you are solving their unmet needs.

"Rob, my partner, had suffered coeliac symptoms for years. He wasn't impressed with the majority of gluten free products on the market, and we suspected that others may feel the same way.

We did our own **desktop research**. We could see there was a rise in alternative eating, with more and more consumers looking for gluten free products.

We could also see that no one seemed to be doing Banana Flour. This was an entirely new concept.

This would be a new product that we would need to introduce to the marketplace. This certainly was an opportunity!

Over the years, we've learnt about our consumer less through formal research and more from face-to-face contact and through our own data. I've attended countless Health and Wellness, and Gourmet Food Shows, here and internationally. They give you a unique first-hand understanding of how difficult it is to find gluten-free alternatives that taste great.

Our Facebook for Business account and **online back-end data** has also given us great insight into what people are searching for and why."

IDEATE

Generate innovative ideas to help solve those needs and desires. Take the best idea and pursue further to find the most feasible for the company, most viable commercially and most desirable to the customer.

"Initially, we had been hand-making small 6kg batches of banana flour and selling it through the Watkins Family Café. The work was arduous. Green bananas are extremely hard to peel. With demand growing from week to week, Rob put his mind to designing a way of automating the process.

He is always inventing and thinking of better, more efficient solutions to farming.

It was no surprise to me that he designed a peeling machine – the first and only peeling machine in the world.

This increased output to approximately 350kg per week which also sold-out weeks, and often months, in advance."

PROTOTYPE/TEST

Take the best idea and turn it into a realistic outcome so that it can be tested and critiqued so that any flaws can be identified and re-designed. The final prototype is tested and validated.

"From selling only in the family café, we thought we would test out selling online. We were early adopters of Facebook for Business and got a **web designer** to set us up an online shop. Soon we were selling so much, we couldn't supply enough bananas from our farm to keep up with the demand. So, we started buying bananas from others farms in the state – Cavendish and Lady Finger bananas.

Rob experimented further and ended up creating NutroLock™. This is our cold, raw, low speed, food processing technique that can convert a green banana to powder in under 25 minutes. It also locks in nutrients 20 – 50 times more than standard food processing techniques.

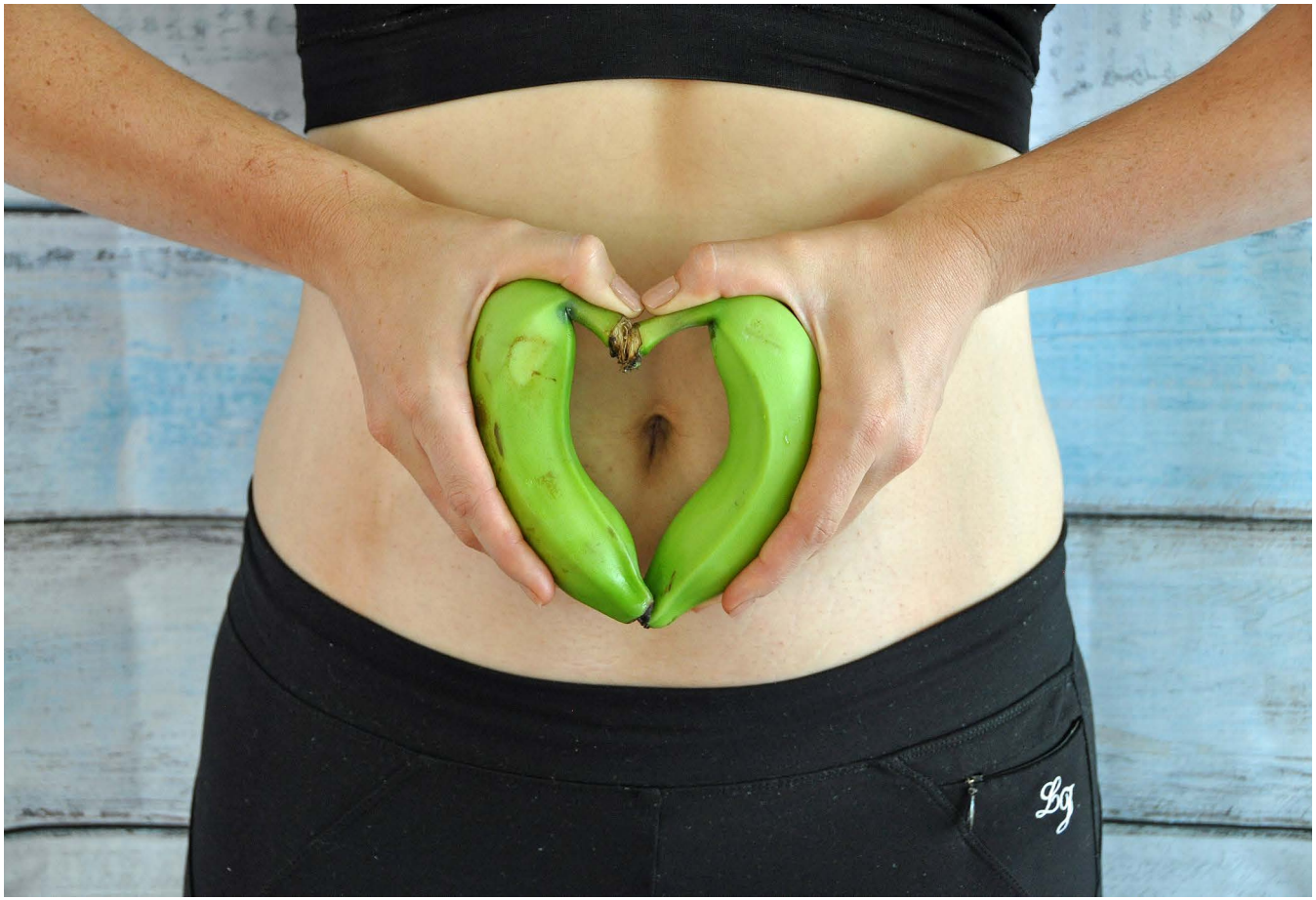
Over time we tried our process on other fruit and vegetables – broccoli and sweet potato for example. NutroLock™ technology can now be used to create products from a range of other fruits and vegetables, and effectively preserves the nutritional benefits for up to three years.

We had to know more about the supposed health properties of our flour, that had been mentioned by some of our customers. After accessing a FIAL grant, we took both a Cavendish and Lady Finger banana sample to a testing lab.



They were as astounded as us to discover that with the Lady Finger banana we had stumbled across the world's richest source of something called 'resistant starch'.

Resistant starches, unlike normal starches, are not digested in the small intestine, providing numerous benefits including helping to prevent colon cancer and diabetes, promoting weight loss and boosting the immune system. It is antimicrobial to harmful bacteria and can be used in literally hundreds of applications, from baked goods to boost nutritional profile, to cosmetic and pharmaceutical uses for diet and skin care. More desktop research told us that there was a huge global market for this stuff!"



EXECUTE

Use what we have learned about the customer to inform how we proceed.

RESEARCH COLLABORATION

“Over the years we have commissioned research from many universities to inform how we proceed. We worked with the University of Queensland to understand more about pasta made from green banana powder and the effect that had on digestion.

We’ve worked with others including the Department of Agriculture and Fisheries in Queensland (DAF) and the University of Queensland and Tasmania, mainly to discover what else is in the powder and how it could be turned into other products.

We are currently working with a hospital research team who anticipate that our resistant starch may help kidney transplant patients by lowering the rate of rejection as well as lowering secondary infections.



NEW PRODUCT DEVELOPMENT

Research results informed how we proceeded with our products. We recognised the opportunity to produce the higher value prebiotic powder and other health products from the more expensive Lady Finger bananas. We decided to leave the more readily available, and lower price point Cavendish Bananas for baking product.

We took banana flour, broccoli and sweet potato flour to market, replacing our homemade bags with professional **packaging design**. We brought in a **Marketing specialist** to help us launch some pre-mix cake and dough products and advise on how to improve our **online shop**.

We looked at ways we could maximise the prebiotic ability of the green banana resistant starch and developed an entirely new product called GUTHEALTH+.

This is a unique synergy of three fibre groups, vitamins and minerals that delivers an all-natural product designed to optimise gut health. It is registered as a food with health claims through FSANZ including support and protection of a healthy gut microbiome and support of gut barrier health, among others.

It was an iterative process, with a lot of trial and error over an extended timeframe to create this new product. We had to determine the perfect balance of plant fibres and probiotics to ensure consumer palatability derived from only all-natural ingredients.

We also developed Banana Ointment by extracting the antioxidants from the banana skins. It is naturally anti-bacterial, anti-fungal and anti-inflammatory and hailed by some as being truly ground-breaking.

We used it on our blue heelers who would suffer ‘hot spots’ a bacterial infection related to staph that is present during tropical months. Its effect was transformational and fast – we wanted other people and animals to experience it.

We sell our products overseas to more than 50 countries.

The only reason we have not launched in the US market, is that we are struggling to keep up with current demand. When our new facility comes online in 2022, we will launch in the US.

ADVANCED MANUFACTURING INVESTMENT

To meet the increasing consumer demand for the banana flour and in order to scale the health supplement side of the business we applied for a grant from Commercialisation Australia.

> **This helped us build the world's first pharmaceutical grade banana flour facility.**

This facility can produce one tonne of flour during an eight hour, two-person shift, and the richest and most natural prebiotic supplements.

We also applied to FIAL for funding to help us execute and deliver our design for a new drying technology.

Working alongside **design engineers and a software designer**, we have developed a new Blade Dry model that not only provides us with ten times the volume, but it can simultaneously mill and dry large volumes of highly fibrous material, delivering an end product that has even greater nutritional integrity.

We are in the process of replicating this technology to help advance opportunities for other Australian farmers and businesses that require disposal of organic matter, or for pharmaceutical production. They too could create products from waste on a commercial scale.

BUSINESS MODEL DESIGN

Initially, we marketed our banana flour under a different shelf name. When we recognised the opportunity to produce prebiotic powder and other health products, we changed our name to 'Natural Evolution' to better reflect the consumer's expectations. We created the **brand name** and engaged a designer to bring our **visual identity** to life.

Now we are selling our drying processing technology to farms around Australia to help them create more scientifically verified functional foods and products from their own fruit or vegetable waste we have again redeveloped our business model. 'Evolution Industries' better aligns to our new customers' expectations.

By shifting the drying processing to the farms, we will look at shifting our model again and creating a 'Processing Collective' model instead.

This means that within any given area of particular fruit or vegetable mix, there would be a central processing location that the farms would send their produce just for bagging and blending.

I've been looking into purchasing a new facility for the first one. Not only would it do the bagging and blending but we would bring the brand part of our business together under the one roof and hire a **full-time visual designer**. I may create a precinct where we can join with other complementary food producers working with food waste.

SUPPLY CHAIN COLLABORATION

We no longer grow bananas on our own farm but buy it from others farms across the state. Last year, we purchased over 1 million metric tonnes of bananas. We have developed a unique quality assurance program that traces those bananas from paddock to factory.

What began as an innovative use for tonnes of wasted/over-supplied bananas for us, is now a viable new market for other Australian growers, and not just for their waste.

Growers have the option of another marketplace for their produce and in fact the potential to earn more for their higher grades of bananas. Rather than sending to the fresh food market growers they have the option to supply to us. This means they save on packaging and freight especially when prices are low due to oversupply in the fresh fruit market.



ENVIRONMENTAL AND SOCIAL IMPACT APPROACH

Everything we have done has been driven by a desire to reduce food waste and tread more lightly on the earth.

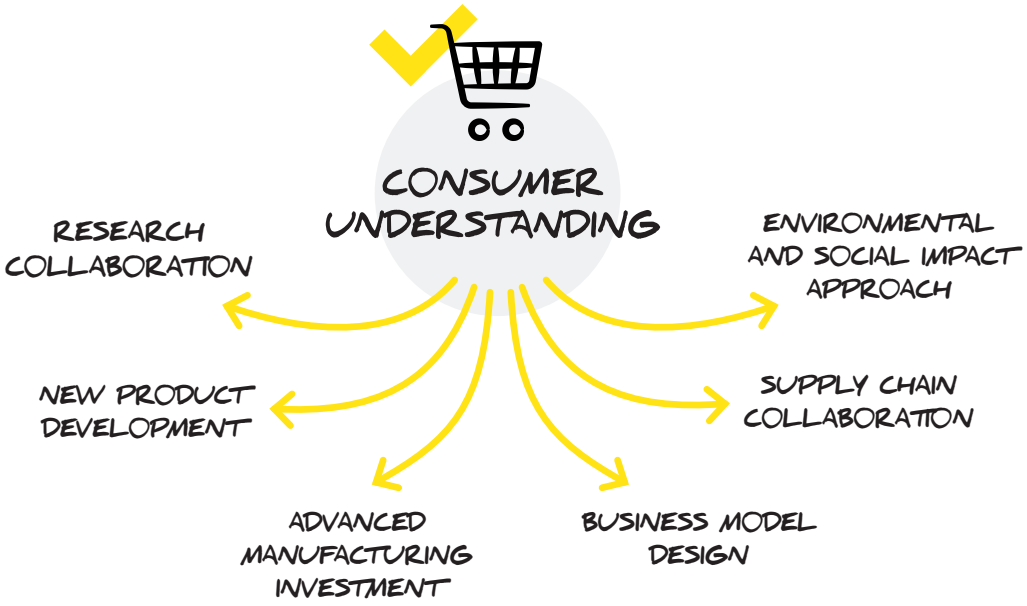
The bananas we now buy from other farms are grown organically and bio-dynamically with optimal nutrition and care to ensure we deliver the best nutrient dense and completely natural food product for our customers.

> **By designing our unique NutroLock™ process, we have in effect, frozen time. We have taken a product that ordinarily would have gone rotten or been thrown away and turned it into a new product with a shelf life of five, ten, or more years depending on the product.**

This has transformed not just our lives as (ex) banana growers giving us a more secure income, but its effect is being felt across Queensland.

It is reducing food waste on a state, if not national scale, while increasing the security and wellbeing of families and communities."





What was your biggest learning and what, if anything, would you have done differently?

"Innovation – doing something entirely new – is hard. You need to have an open, flexible 'creative' mindset if you like. Sticking with your vision and seeing it through is critical – that includes being adaptable."



BUSINESS SUCCESS

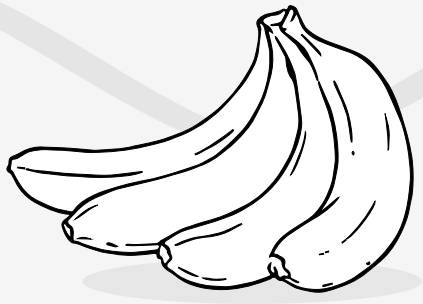
SELLING IN OVER

50 COUNTRIES

AND ACROSS AUSTRALIA

WORLD'S 1st

GREEN BANANA PROCESSING TECHNOLOGY



WORLD'S 1st

AND ONLY NUTRACEUTICAL GRADE BANANA POWDER FACTORY

"Everything we have done has been driven by a desire to reduce food waste. We have taken a product that ordinarily would have gone rotten or been thrown away and turned it into a new product, transforming ours and others' lives."

Krista Watkins
Co-owner, Natural Evolution

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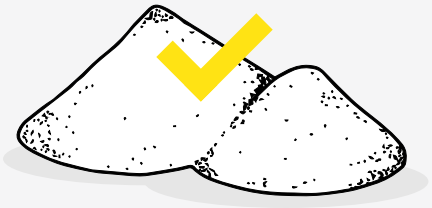
BANANA FLOUR

PRODUCT IN AUSTRALIA

DOUBLING EMPLOYMENT

ANNUALLY

$1,000,000+ REVENUE

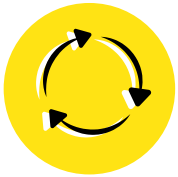


FIRST TO DISCOVER THE

WORLD'S RICHEST SOURCE OF 'RESISTANT STARCH'

The Australian Design Council is a not-for-profit industry body advocating for a design-led future for Australia to deliver long term growth and national prosperity. It champions the role of design in addressing complex social, economic and environmental challenges.

australiandesigncouncil.org



“Architects and designers are absolutely vital in the shift to a circular economy.”

Ellen MacArthur, Ellen MacArthur Foundation, Dezeen, 2019

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