

## Hidden in plain sight – unlocking New Zealand’s biological riches



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Behind New Zealand’s rolling paddocks, lush pastures, plump animals and fruit-laden plants lies a biological system of almost unlimited economic and environmental potential. We call it agriculture, but if we zoom it down to the granular level, it’s doing more clever things with the cells and molecules that make up every living plant and animal in our agricultural system.

In New Zealand, we’ve got form. Glaxo was founded in 1904 just out of Palmerston North on the back of milk proteins and is now a cornerstone of GSK (formerly GlaxoSmithKlein) with a current market value of NZ\$185 billion. Then fast forward to Kiwi Maurice Wilkins’ Nobel Prize in 1962 alongside Watson and Crick for discovering the double helix of DNA.

New Zealand pastoral, arable and horticulture farmers, backed by scientists, are great at this stuff. Plant breeding innovations have birthed new varieties such as the JAZZ™ apple and Zespri™ SunGold™ kiwifruit (145.3 million trays produced in the 2024/25 season). Our \$25 billion dairy industry is built on our growing knowledge of milk proteins that is 100+ years deep.

Today, a phalanx of new-generation companies are racing to unlock new value from the biological base of our farms, forests and oceans. Lamb stomachs were previously sold to South Asia as low-value edible tripe. Now, South Auckland-based Aroa Biosurgery repurposes those lamb stomachs as the base material for high-value human tissue regeneration products registered in 44 countries and pulling in almost US\$100 million per year. One person’s lamb stomach can be another person’s cellular matrix containing 150 bioactive molecules to help humans grow back faster.

It’s not well known that New Zealand has more people holding PhDs in life sciences per capita than almost any other country on the planet. Through our Crown-owned research centres (recently merged into one of the world’s largest integrated biotechnology organisations), these highly qualified people are spread across the motu unlocking the mysteries of milk, the magic of meat and the secrets of seaweed. Scion even has a ‘bark biorefinery’ looking to turn forest waste into high-value biopharmaceutical products.

Even our geographic isolation comes in handy. It gives us the ability to exercise greater control over what biological material comes in and goes out. Likewise, having the highest livestock disease-free status globally (free of prion diseases) and a vastly diverse plant base, rich in bioactives, means we truly don’t lack for biological source materials.

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### From individual brilliance to biotech machine

So we’re stacked with biotechnology strengths – the question for the next 25 years is whether we are bold enough to use them. Do we simply want our food and agri system to stay status quo? Baby steps? Or real step change? Looking around, I really believe we need the step change.

Science progresses because determined people keep going, even when the system offers almost nothing to help them grow. They collaborate to move New Zealand forward – and I jest that they do it without light, water or food.

Recently, there have been a couple of big steps in the right direction – positive steps towards a better 2050.

The creation of the new Bioeconomy Science Institute (BSI), brings the term ‘bioeconomy’ back into the national consciousness. BSI is strengthening the ecosystem. It’s working with start-ups. It’s working in synthetic bio. It’s also setting up a big bioprocessing plant.

BSI is already using gene technologies to learn about plants and how they grow. However, under the current regulations, nothing modified can be for commercial release despite finding gains in animal feed efficiency, drought and pest resistance, and increased nitrate and methane absorption.

It’s also encouraging to see we’re building biological science bench strength on the Board of Research Funding New Zealand as well as the Prime Minister’s Science, Innovation and Technology Advisory Council and the Institute for Advanced Technology. We’re going to need sustained boldness of scientific leadership to break out of our current regulatory straitjacket.



### Finding a regulatory backbone

We succeed in spite of our regulations, not because of them. We've grown more risk averse as a nation. Our first question is usually about what might go wrong rather than what we stand to gain or what we risk by standing still – it shows with so much scaremongering around the new Gene Technology Bill. Despite the brave leadership shown by Minister Judith Collins, it feels like this Bill has gone to ground until the next election.

The new Bill will simply help us play catch-up to what Australia already has now. It's only 20 years behind and in the middle of updating its regulations, while we're around 30 years behind.

In 2025, Food Standards Australia New Zealand revised its definition, specifying that foods are not classified as genetically modified when the genetic change is one that could arise naturally, can be produced through conventional breeding or is created using new breeding techniques like genome editing provided no novel DNA is added. This is an incredibly sensible classification.

I believe a lot of our farmers continue to work with one arm behind their back. The inability for our farmers to use new gene technologies is not the only area that is slowing innovation. There is also a lack of urgency to get agrichemicals and veterinary drugs out to our farmers, growers and veterinarians. We're facing years-long delays in bringing products into New Zealand, including products that have been safely used overseas for years. This is not just stifling innovation but day-to-day livestock and horticulture productivity.

### Moving forward

We need to consider the risk of not doing something and start looking at what the rest of the world is doing and what consumers are asking for.

Co-existence keeps coming up as a concern for New Zealand. Australia has done an incredible job saying it's for the market to choose. It has a Market Choice Framework. Instead of the government coming up with more regulations, the canola sector identified practical measures to ensure the Australian canola industry could continue to meet the needs of customers and consumers: "We want to be responsible, ethical and we want to value our neighbours and everyone around us so we're going to set good practice." If there's a GM crop next to a non-GM crop, it has to be 10 metres apart. It has all of these checks and balances through the supply chain and they're all working together. We can do this in New Zealand – driven by farmers, not government.

At the end of the day, biotech is a technology. If we're talking about biology as kind of the base of New Zealand farming, we absolutely need technology to understand our systems so much better and make them more efficient – with gene tech part of that 2050 story.

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