JARRED MAIR

Embrace technology to seize the future

Jarred Mair is Chief Insights Officer at MPI and has over 20 years' experience working with the food and fibre sector, holding senior roles in the public and private sectors. He leads MPI's Insights team, taking a systems view to track and analyse impacts from geopolitics, trade, market shifts, new technologies, value chain enhancements, emerging business models, farming systems and inputs and mapping the implications back onto New Zealand's economy. The team also undertakes detailed studies into topics relevant to the sector such as strategic framing of the sector, alternative proteins and genetic technologies.

The next 10–15 years will see the largest transformation of the global economy in the last 150 years. All bound together by AI, we're entering the fourth industrial revolution – a labour revolution, financial revolution, agricultural revolution, biotech revolution and societal revolution all at the same time.

AI, AI, it's off to work we go

AI is a technology accelerant for creating new capabilities as well as deepening our capabilities within certain technologies to impact our food and agriculture value chain in every way. There are already companies delivering services in this.

For example, most farmers go through 45 years in a standard working life. AI platforms and AI agents can aggregate the knowledge of all farmers across all seasons, support decisions, take actions and drive profitability over time. We'll have unlimited knowledge about what decisions to make in different situations across all production systems.

Farmers will become system managers – for activities on farm, information flows, things that are waste or low value – and generate new revenue streams. They'll conduct the orchestra rather than having to play every instrument themselves.

Within 10 years, expect humanoid robots to be in in our milking sheds and in horticultural use, picking, pruning and thinning. Large-scale commercial production of these humanoid robots is set to ramp up from 2028 to millions of units per annum by the end of this decade, starting in the car industry. That is a massive phase shift in terms of how we think about what happens on farms.

Synthetic biology, biologics and alternative fertilisers will deepen, broaden and accelerate, often at exponential rates, due to AI.

In the gentech space, CRISPR gene editing techniques will design the proteins for targeting and cutting DNA, which means it's faster, quicker and more stable in terms of multiple ongoing iterations.

We're now seeing bacteria that can enter a plant and sequester up to 50% of its nitrogen needs from the air. There are already 2 million acres planted in the US across corn, rice and potatoes. In biosecurity, the use of synthetic peptides in insecticides can target a single pest. Varroa mites are a case in point.

Connecting growers and consumers

Tokenisation of the value chain is coming – the process of representing physical, real-world agricultural commodities into digital tokens on a blockchain. Each token represents ownership, rights or value, enabling transparent, secure and efficient tracking and trading from producers to consumers. Steps in a transaction are verified in a fraction of second, effectively shortening value chains and increasing velocity of payments. This revolution has already started in third-world economies with cocoa, coffee, grains and tropical fruits, and it's progressively building out for the global food system.

It means a customer or consumer in New York can basically reach back down the value chain and connect with the producer of a good. These new value pathways are redefining the role of retail in the food system through digital platforms and autonomous food delivery.

These tokens will unlock a deeper connection to the consumer whether it's through a provenance or assurance story, an accreditation system or to carry the regulatory certificates.

Silver tsunami

Ageing populations and AI are creating new opportunities for New Zealand producers to shift from a mass market approach – marketing the same product to lots of people – to a more personalised approach emphasising high nutritional foods to discerning wealthy consumers.

People over the age of 50 currently represent 34% of global GDP (around US$45 trillion) but account for 49% of food and beverage spending and 60% of health spending. By 2050, that same cohort will shift to 39% of global GDP, worth about US$118 trillion. That's phenomenal growth.

Older people are seeking highly functional foods that are more easily digested. That's a function of age. Around 10% of Americans go to their doctor at least once a year because the food they eat is too complex for them to digest. The new GLP-1 (weight loss) drugs are adding to the shift towards higher nutritional meals and smaller meal sizes.

These trends favour New Zealand because we produce natural foods that are generally easier to digest than complex or processed foods. We don't currently foresee alternative proteins moving beyond 10–25% of some markets. Those food types are very capital intensive and expensive and require high energy input to operate.

Water tech on the way

New water technology is about to come into the market to increase water certainty at both a localised farm and regional scale. We can increase the productivity of land that is otherwise too dry. This technology pulls water straight out of the air to condense it without high energy use.

A mobile off-grid container-based system with solar panels can produce 1,000 litres a day. Larger ocean-based units powered by wave energy can produce 50,000 litres per day. If scaling of these technologies continues as expected, it means water certainty for horticulture and dairy farmers, while Kiwi sheep and beef farmers who often need to sell early in a drought season may be able to hold off for better prices.

Feeling the energy

In the UK, 2 million homes now get their gas produced from animal waste through biodigesters. This could grow to 10 million homes. As New Zealand looks to transition its energy supply, we have the ability to take waste streams off farm and use them as inputs into the energy system and to place wind energy systems on farms to graze underneath them.

There for the taking

The New Zealand food system, as a whole, is in the sweet spot. There will be volatility, but there's a massive opportunity sitting there.

In the past, our discussions have been focused on our problems. The conversation will quickly switch to the solutions and technology we want and how we make that work as a country. It's about moving from problem definition to solution.

We need to be proactive and early adopters to get these technologies and capture the benefits of their capabilities. They won't come here unless we go get them. Why would they come here to a small market when they can sell thousands of them overseas, much closer to home? We are going to have to be far more proactive around these technologies than we have been.

We know we're in a very good position with where the world's going. The next 15 years is a sort of a Goldilocks zone – not too hot, not too cold, growing population, massive demand increases, lots of food required. The future is ours to grab and to shape – for all of New Zealand's benefit.

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