

Eating food made from plant material that looks and tastes like animal protein is touted as the answer to feeding the growing global population and supplying the 70% more food required by 2050. But this second part of a series by **Neal Wallace** looking at whether plant protein mimicking milk and meat is a threat or opportunity discovers the rhetoric of its advocates differs from reality.

Demand for meat will continue

THE simplistic message from synthetic meat advocates has been that a global shift to a diet of food made from plant protein instead of meat will feed the world from sustainable, low-impact, climate-friendly production systems.

But Massey University nutritionist Professor Paul Moughan said it didn't take much digging or scientific rebuttal to see the fallacy of those arguments.

Despite that, the view that plant protein food that tasted and looked like meat, milk and eggs could replace that from animals was widespread until it was pointed out the supporting evidence was superficial.

Companies around the world were investing hundreds of millions of dollars in research to mimic the taste, feel, smell and texture of meat, dairy and eggs out of plants or cell cultures, saying the environmental and ethical cost of factory farming animals was too great.

“There will always be demand for natural-based products – meat, milk and kiwifruit. I think we will always have a future doing what NZ does well.”

Professor Caroline Saunders
Lincoln University

They were close to their goal but Moughan said when measured on a land-use or whole-system basis, vegetable protein could not compete with ruminant animals.

Much of New Zealand's terrain suited livestock but not crops and produced meat efficiently.

That aside, the scientific reality was that plant protein was not as efficient as animal protein in delivering amino acids, providing nutrients and micro minerals.

“We don't eat protein for the sake of eating protein.”

“We eat it for the basic building blocks, amino acids.”

Animal protein was also a better source of calcium, phosphorus, zinc, iron, copper and omega 3 fatty acids than plants.

Nutritionally, a vegetarian diet could be deficient, stifling and difficult to follow and sustain.

“We see that in developing countries with malnutrition, what they call the hidden hunger.”

“They appear to be getting enough energy and appear to be getting enough protein but they are deficient in things like zinc, manganese – a lot of these elements you get from meat, milk and eggs.”

Moughan said the optimum diet had a balance of food and while it could be argued it should contain less animal protein, a shift to an all-plant-protein diet would not solve the issues its advocates claimed.

“It's not evidence-based and it is an extreme view.”

“It's too extreme and does not take into account the use of land, the quality of protein and what it provides us as building blocks.”

The health benefits and consumer demand for animal protein would ensure its future but interest in plant protein could result in new foods incorporating plant and animal protein being developed.

“Pasture-fed milk and meat will have a great future.”

“When you look at it from a systems point of view, they are very efficient.”

But scientists and farmers needed to be vigilant and use scientific evidence to resist what he called “the simplistic literature” promoting plant protein over animal, something he has done successfully on the international stage.

Lincoln University agribusiness and economic research unit director Professor Caroline Saunders agreed that plant protein was not a significant threat to animal protein but NZ producers should not be complacent.

“There will always be demand for natural-based products – meat, milk and kiwifruit.”

“I think we will always have a future doing what NZ does well.”

Competing protein products were just another on the list of production and environmental challenges facing meat and



HANG ON: Simply replacing meat with proteins made from plants is not as straightforward as its proponents suggest, Massey University nutritionist Professor Paul Moughan says.

milk producers and heightened the need for NZ to position its products as high-value and niche.

Saunders said repositioning our natural, pasture-fed, free-range products away from the commodity end of the market had to be done sooner rather than later.

While plant based meat and milk substitutes might appeal to some in the market, many people would be deterred because it was made in laboratory.

Fonterra nutrition manager Angela Rowan said milk was one of most complete sources of nutrition available and most alternatives failed to provide “that rich package of nutrients”.

“So, any artificial milk in the future would have to replicate dairy to be a credible and nutritionally useful substitute.”

Rowan said global consumers were moving away from extensively processed to natural products, a trend she believed would continue.

“We're seeing that transition away from extensively processed products to nutritious, natural foods including the switch to dairy fats such as butter and cream for cooking and food preparation,

driven largely by consumer demand.

“As the global population grows so, too, will the need for nutrition that is rich in high-quality protein and nutrients, such as milk, cheese and yoghurt and we believe consumers around the world will increasingly move towards dairy to fulfil their desire for more natural products that meet their dietary needs.”

Rowan said world health authorities recognised the value of dairy and included it as a major food group in dietary guidelines because its nutrients could be sourced only from cow's milk.

“Dairy is a rich source of many key nutrients that are difficult to source from other single foods including calcium, phosphorus, potassium, vitamins A, B12 and riboflavin while also being a source of high-quality protein.”

Should plant protein meat and dairy substitutes take off as quickly as cell phones did in the last decade, Massey University sustainable energy expert Professor Ralph Sims questioned the future for NZ farming.

Plant protein used less water, required less area and could feed more people than animal protein

and produced lower greenhouse gas emissions.

Sims said it had been claimed protein-producing “tower factories” could achieve 70 times the land area density in terms of tonnes a hectare compared to field crop production.

“There would possibly be a high energy penalty but if this can be met by renewable energy systems, the carbon and water footprints would be far lower than from farming animals.”

There was also potential for 3-D printing of synthetic steak that looked, smelled and tasted like it came from a cattle beast.

That technology, together with plant protein meat and milk substitute, could be a self-sufficient means of producing reliable, safe food for the 70% of the world's population expected to be living in mega-cities by the middle of the century.

Conversely, reducing methane and nitrous oxide emissions from NZ livestock farming was proving challenging.

“We may be able to continue to export animal products that we currently rely on but perhaps only to niche markets as competition increases,” Sims said.