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. Eating food made from plant material that looks and tastes like animal protein is touted as the answer to feeding the growing global

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 climate-friendly production

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

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

Despite that, the view that

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.

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

Professor Caroline

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

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 mir

"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, phosphorous, 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

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

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 Moughan said the optimum diet had a balance of food and

"It's not evidence-based and it is

the quality of protein and what it provides us as building blocks."

The health benefits and "It's too extreme and does not take into account the use of land,

but interest in plant protein could result in new foods incorporating plant and animal protein being protein would ensure its future

"Pasture-fed milk and meat will

have a great future.

"When you look at it from a systems point of view, they are

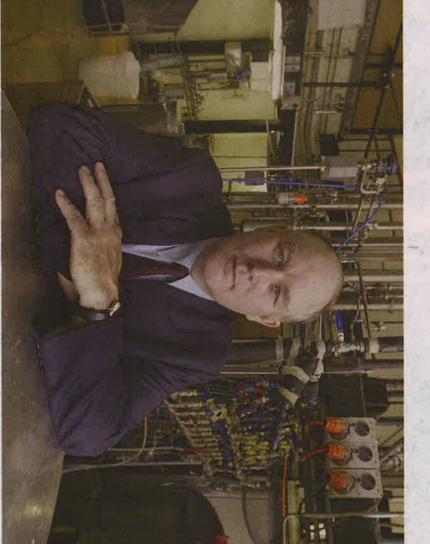
very efficient."
But scientists and farmers
needed to be vigilant and use
scientific evidence to resist what
he called "the simplistic literature" promoting plant protein over animal, something he has done successfully on the international

was not a significant threat to animal protein but NZ producers should not be complacent.

"There will always be demand Lincoln University agribusiness and economic research unit Saunders agreed that plant protein

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



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

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

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 products, a trend she believed sed to natural

would continue.
"We're seeing that transition products to nutritious, natural foods including the switch to dairy fats such as butter and cream for away from extensively processed

driven largely by consumer

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 demand.

"As the global population grows so, too, will the need for nutrition that is rich in highquality protein and nutrients, such as milk, cheese and yoghurt

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

tonnes a hectare compared to field crop production. protein-producing "tower factories" could achieve 70 times the land area density in terms of

"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-

Conversely, reducing methane and nitrous oxide emissions from NZ livestock farming was proving the world's population expected to be living in mega-cities by the sufficient means of producing reliable, safe food for the 70% of middle of the century.

challenging "We may be able to continue to

export animal products that we currently rely on but perhaps only to niche markets as competition