

NZASE  
scientist  
profile

# Palatasa Havea MNZM

## Born where and when

Vava'u, a Tongan island group ~300km north of Tongatapu.

## School

Tasa failed fourth form twice on Vava'u. In his third attempt, he sat NZ School Certificate but passed only two papers. "Failure was common in our school and the country did not expect much from us," he says. He was encouraged by his father, who believed education was the path out of poverty for his large family. Tasa moved to Tongatapu for his last high school year.

"I lied to the principal of Tupou High school that I had done school certificate, so he put me in a Form 6 class". There Tasa found an inspirational biology teacher and learnt to read properly. "This school made me believe in myself. I got prizes for many things and discovered I liked education. When you are around good students you can't help but try your best. But I still haven't passed School Cert!"

## How he got into science

Tasa always liked finding the answer to problems. "When you go fishing and don't catch anything, you want to figure out why. If our garden crops were really successful one year, I wanted to know why compared with last season."

When he was a kid, Tasa says he learnt science by observation, but didn't know the theory or the reasons. "In Tonga, we'd see ants and cockroaches flying before the rain came. They fly because the pressure changes, but we didn't know the cause just from watching them. It's fascinating to make those links and

*Professor Havea with his daughter Lueni at Government House after his investiture with the NZ Order of Merit in 2018.*

understand the reasons."

He'd eaten chocolate, ice cream, corned beef and other foods in Tonga, "but we never knew how they were made". During his food technology degree, "it was fascinating to see the effect of salt in preserving food and the science behind those foods".

## Training and jobs

**B. Tech; M. Tech.** (First Class Hons); **PhD**, all in food technology, Massey University.

- **Factory worker**, Tongan Commodities Board, producing dried coconut, juices and sauces
- **Research scientist**, Dairy Board & NZ Dairy Institute
- Eventually **Principal Research Scientist**, Fonterra Research & Development Centre
- **Dean Pacific**, Massey University

Tasa says a collective approach works best for most Pacific students and staff. "They work as a group. You win one; you win the rest." At Massey he wants to build a culture of fun and communal hard work. Massey is creating café learning hubs in south Auckland, where distance students meet to study. "Students in isolation are more vulnerable to failing."

## Field of science

Biotechnology, molecular & structural biology.

## Investigating whey protein

Tasa's PhD focused on the properties of whey protein, a nutritional by-product of making



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cheese, which at that time was usually fed to pigs. “Whey protein contains high levels of essential amino acids, and is the best protein for humans, especially sports people and others doing physical work,” he says.

“Whey protein had been used by the food industry mainly as a thickener. The challenge was how to make a whey protein that adds nutritional value but does not change the texture of the host product. The trouble was that a bit of heat makes the protein solidify - if you add only three percent of whey protein to a bread mix, your bread will be like a rock.”

Tasa spent much of his science career studying the molecular structure of the protein and how that relates to its functional properties. “We read a lot of theories and research papers – “you have to test everything you read. I was looking for something that other researchers had not already done”.

The challenges were to separate the way the protein behaved when heated while keeping its nutritional value, and to develop a process for manufacturing the protein in huge amounts.

Tasa is not allowed to describe the exact process the team developed, because it is confidential. His team tried different ways to change the protein structure, applying heat or pressure to different concentrations of protein, under different conditions. They found processes that alter the whey protein structure and thus its functional properties,



*Palatasa Havea during his time at Fonterra.  
Photo: Ian Porritt.*

and invented an economical, large-scale commercial process for making whey protein with the full nutritional value but without the ability to form gel when heated.

Many organisations similar to Fonterra in other countries were competing to do the same thing, “but New Zealand was first. It took eight years to crack it, but once you open one door you can apply it elsewhere.”

The research by Tasa’s team led to several patents, and enabled Fonterra to add nutritional whey protein to yoghurt, energy drinks and bars.

## What he likes about science

“Learning new things, how to do things differently; it’s very exciting and fulfilling to solve big problems. Sometimes the solutions are very simple, not necessarily very complex.”

## Links

- [Tongan scientist Palatasa Havea motivates South Auckland students](#) *Stuff*, 56s video.
- [Palatasa Havea: ‘Everybody wrote me off’](#) *RadioNZ*, 16.6min audio.
- [The scientist who spent three years in year 10](#). Massey University, article.

## Ngā Kupu

**Arumoni** – Commercial  
**Kurukuruwhatu** – to curdle, in making cheese  
**Ngā wai karera** – Whey  
**Pūmua** – Protein  
**Tihi** – Cheese  
**Waikawa amino** – Amino acid

From *Te Aka Maori Dictionary*  
and *Paekupu*



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