



ONE WHENUA, ONE HEALTH FRAMEWORK

1

What is the ONE HEALTH concept?

- ▶ human health cannot be viewed separately from the health of land, soil, plant, people, animals (all sentient beings)
- ▶ all well-beings are interconnected and interdependent.
- ▶ ONE HEALTH seeks to promote optimal health for people, domestic animals, wildlife, plants and our environment
- ▶ ONE HEALTH Aotearoa includes veterinary, human and ecological health alliance [<https://onehealth.org.nz/>]
- ▶ ONE HEALTH acknowledges that human activity is a driver of both pandemics and degradation of the environment.

The opportunity: Aotearoa New Zealand's leadership in ONE HEALTH:

- ▶ NZ has a well-connected scientific community
- ▶ NZ has the willingness to engage and include existing indigenous Māori world view and knowledge system
- ▶ There is ground-swell development of novel on-the-ground, tangata whenua (see BOX 1) activated science -which emphasise holism and interconnectivity between all capita (human, natural, social, economic)
- ▶ ONE HEALTH Aotearoa has contributed to Internationally acclaimed NZ response to COVID.

2

Example of the ONE HEALTH concept applied to a dairy system

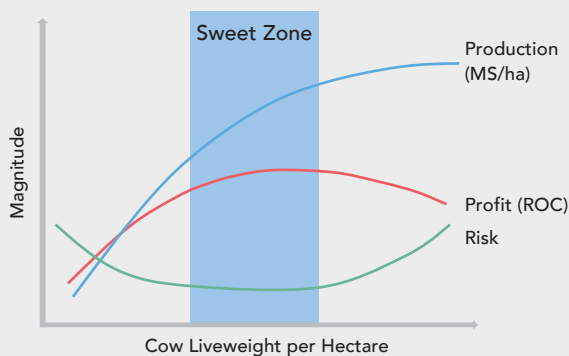


FIGURE 1: Conceptual Diagram of the magnitude of production, risk, profit, in a dairy farming system relative to cow live weight per unit area, illustrating a hypothetical “sweet zone” of cow live weight per unit area that best balances production, profit and risk

Putting WHENUA back in the picture

The interconnection of the health systems between our environment, animals and people is a primary foundation of wellbeing. At the heart of our nation's intercultural health system is whenua – life-giving placenta – consisting of the microbe-rich soils of Papatūānuku (Earth Mother), nourished by the rains, springs, streams, and rivers originating from Ranganui (Sky Father). This soil–water combination or whenua provides the organic base from which terrestrial plant life emerges, capturing the energy of the sun, driving the photosynthesis engine on our planet.

The cycle of water does not stop at the river mouth. It mingles with our moana (ocean), carrying nutrients, replenishing, feeding, and flushing a complex cycle of marine life, directly contributing to our delicately balanced biosphere. In combination with currents, tides, waves, and atmospheric slipstreams, the moana also provides climatic stability, absorbs and stabilises solar radiation, oxygenates its depths and moderates our seasons. At every point water evaporates from its biodiversity-cloaked surface back into the waiting arms of Ranginui before again returning to Papatūānuku as precipitation.

From a Māori world view the life-carrying properties of whenua (water engagement with active soil) – from source to sea – only exist where the energy to create, disrupt or disintegrate is in balance. This energy cycle we call mauri sits at the heart of the ancient Takarangi double spiral, representing the universe. Within the embrace of Rangi and Papa exist their three principal offspring who maintain our biosphere balance: Tāne Mahuta is the atua or great ancestor attributed with guarding and producing terrestrial photosynthesis and animal life; Tangaroa is responsible for all oceanic photosynthesis and marine animal activity; while Tāwhirimātea is the atua who provides atmospheric conditions that check and balance his two brothers. If the mauri of these three primary drivers of planetary life is in balance, then so is our biosphere.

For Māori the concept tāngata whenua means people of the soil and more. It identifies the source of your biological existence – the placenta unique to the originating marae community that has nourished your ancestors for generations. Applied cross-culturally, tāngata whenua also equates to the health-giving properties of your wider water catchment and its ability to provide. In an Aotearoa context, healthy people, healthy ecosystems and healthy animals are key to a healthy future. Where government agencies are bound by administrative authority, pests, contaminants, and pathogens are restricted only by the laws of nature. Health issues cross disciplines. Human health determinants often sit outside the health sector's traditional role, and so does animal and ecosystem health: these determinants include antibiotic resistance, food safety and security, water systems, disease patterns and the effects of climate change and agricultural production systems on soil, air and waterways.



ONE WHENUA, ONE HEALTH FRAMEWORK

4

What does assessing the 'whole of systems' health looks like?

Business Health		Animal Health & Wellbeing		Ecological Health		
Profitability	Return on Capital	Condition	Condition Score Management	Nutrients Losses	Nitrogen Leaching	
	Return on Asset		Nutrition		Phosphorus loss	
	Operating Profit Per Hectare		Transition Cow Management		Effluent System Compliance	
Risk	Operating Expenses per kgMS		Colostrum Cow Management		Sediment Loss Risk	
	Equity Percentage	Reproduction	Fertility Focus Report Done?	Nutrient Utilisation	Soluble N Use	
	Return on Equity		3 week submission rate %		Effluent Area (% of farm)	
% home grown feed in the diet	6 week in calf rate		N Loading from Effluent			
Profitability	kgMS as % of Liveweight	Empty rate	Ecological Health	Ecological Health	Irrigation Water Efficiency	
	Pasture consumed per cow TDM	Longevity			Death Rate	Fencing and Planting
	Pasture harvested per Ha				Lameness Rate	Winter Stock Management
	kgDM pasture Harvest per kgMS	Mastitis			Ecosystem Services	
		Cell count annual average	Waste Disposal System			

FIGURE 2: Scorecard for assessing risk across Business Health, Ecological Health and Animal Health and Wellbeing using readily procurable KPIs. All indicators are benchmarked and the scorecard system is accompanied with a "traffic-light system" indicating 'good, average or bad' health

Current KPIs reflect business, ecosystem, and animal health and wellbeing as a starting point.

Future KPIs (in development) will ideally reflect connectiveness between farms, public health, and catchment's wellbeing outcomes.

5

What changes at national scale might support the adoption of ONE WHENUA, ONE-HEALTH framework?

- ▶ Governmental (including agricultural) leadership acknowledges the interconnectedness of human health and our ecosystem
- ▶ A step change in regulatory design of land use change/ agricultural policy reflects the central focus of a ONE HEALTH approach (how land use has a knock-on effect to human health), **underpinned by Māori World view and knowledge systems of whenua-based interconnectivity, supported by detailed western science.**
- ▶ Anthropogenic nitrogenous inputs are disincentivised, while endogenous nitrogen sources are incentivised (e.g. : move to N fixing plants, diverse species and away from N dependant monoclonal systems)
- ▶ A long term and holistic connectivity plan, **reaching from the mountains to the sea** based on hydrological catchment boundaries.
- ▶ Equality of Indigenous people at the heart of the catchment in co governing roles (i.e.: Jobs for Nature initiatives), ensures whenua enhancing principles are upheld, underpinned by strong environmental bottom lines that are enforceable, transparent and independent of industrial advocacy.
- ▶ The future farm is incentivised for desired outcomes, such as:
 - Mitigating known risks (GHG), carbon sequestration,
 - Simple and sustainable integrated systems
 - Synergies between subsystems e.g. plant food/ arable crops for humans, with by-products for animal consumption
 - Closed systems: nutrients, gas, fibre
 - Optimised animal wellbeing (noting their sentience)
 - Supporting biodiversity, replenishing soils,
 - High quality, transparent, democratised, real time data, available to the consumer.
- ▶ Baseline assessment of Nature Based Services, and increased planting, corridors and cumulative effects at catchment scale are incentivised.
- ▶ The ecosystem of connectivity is taught in schools, science institutions and trades, to enhance creative Education, alternative systems, such as organics, regenerative agriculture education, soil protection, impacts of our activities.