HIGH-VALUE NUTRITION NATIONAL SCIENCE CHALLENGE

FOODOMICS 2022

8-9 SEPTEMBER

CORDIS, AUCKLAND | AOTEAROA, NEW ZEALAND

Shay Wright & Winny Lohan



National

Challenges





May we follow in the footsteps of the original natural scientist, Tane -

Tane the ancestor of health,

Tane the skillful expert,

Tane who ascended the heavens to pursue the baskets of knowledge -

The basket of ancient lore, the basket of esoteric lore, and the basket of human understanding, which he implanted in Mother Earth to birth the human element.

Let us today pursue the clarity and enlightenment just as Tane did,

Let us grow deep in wonder and awe, Let us connect with the life essence and cross from the mortal world to the world of light. Let this be our commitment, and together, it is done!

Setting intention

Philosophy & Worldview

of reality the universe

Creation story Views on history

Economics

Carbon dioxide (CO₂) levels this century will alter the

protein, micronutrients, and vitamin content of rice

HUNWU ZHU 👩 , KAZUHIKO KOBAYASHI 🔞 , IRAKLI LOLADZE 👩 , JIANGUO ZHU, QIAN JIANG, XI XU, GANG LIU, SAMAN SENEWEERA 🔞 , KRISTIE L. EBI, 📖

Declines of protein and minerals essential for humans, including iron and zinc, have been reported for crops in response to rising atmospheric carbon dioxide

concentration, [CO₂]. For the current century, estimates of the potential human

health impact of these declines range from 138 million to 1.4 billion, depending on

1. They are based on an approach of reductionism, separation and siloes

2. They don't allow for the ability to hold the true complexity of reality and so they miss things

Vegetables without Vitamins

Top soil and its degradation

3. There is no recognition of, or place for spirit, mauri, intangible, infinite, immeasurable, in our models.

Four issues with our current model and systems

4. They are easily hijacked and manipulated by vested interests who serve themselves

Dirt Poor: Have Fruits and

Vegetables Become Less

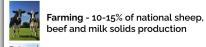
Nutritious?

Fruits and vegetables are less nutritious than they used to



3 F's of the traditional Māori economy

Fishing - 37% of New Zealand's domestic fishing quota



Forestry - 36% of pre-1990 forests

peef and milk solids production



Māori economy



3 F's of the emerging



• 6% decline in protein content

garden crops, 1950 to 1999

The great nutrient collapse

9% decline in phosphorus

• 15% decline in iron

• 15% decline vitamin C (Ascorbic Acid)

• 16% decline in calcium

• 18% decline in vitamin A

38% decline in vitamin B (Riboflavin)

Global Landscape - Direct to customer

heme: Platforms Along with Products

B2C models at play

Assessment-based services

- a. are the broadest and fastest-growing personalized nutrition category
- 2 Genetics-based personalization services
- a. are improving in accuracy, reducing in cost and offering 'Netflix-style' subscriptions
- 3 Biomarker-based services
- a. allow brands to tackle a wider range of health

4. Microbiome-based services

- a. are information-rich but likely limited due to the need for stool samples
- 5. Nutrition from food meals
- a. Personalisation of meals and delivery
- 6. High End Bespoke Health and Nutrition services
- a. These are in person clinics that are usually only accessible to the wealthy class.

Changes in USDA food composition data for 43

nd water in 43 garden crops, mostly vegetables. After adjusting for differe

enerate 2 estimates for the SEs of the 1950 values

to water in 4-3 garden cutys, incosty vegetables. Arter adjusting to indirective stimilistic that in the the control that the foods as a group, we calculate median and geometric mean R-values for the 13 strictests and water. To evaluate R-values for individual foods and nutrients, with hypothetical

fidence intervals, we use USDA's standard errors (SEs) of the 1999 values, from which w

Optimise your nutrition with genetic insights from the Atlas Microbiome and DNA Tests Biotechnology Research · London, England · 1,725 follower



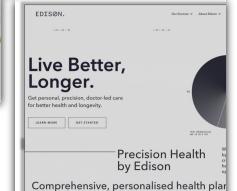
Magnesium

Potassium

Foodvisor

Get results like a pro.

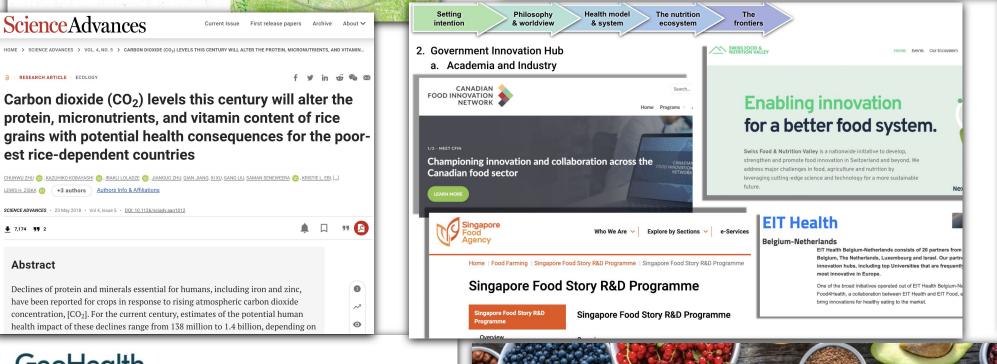
Your personal nutrition guide



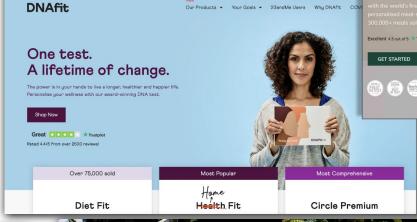
Down 15%

Down 22%

Where does one begin?



These services involve consumers providing a saliva swab to assess genetic information linked to health or fitness. Services vary from complete nutrition programs to those providing a health report and supplements based on DNA.



Loss of nutrient density

From 1940-1991

Mineral Vegetables Fruits Down 76% Down 19% Copper Sodium Down 49% Down 29% Calcium Down 46% Down 16% Down 27% Down 24%

Down 24%

Down 16%

Briahtseed

We're on a mission to illuminate nature to restore human health.

GeoHealth

Science Advances

est rice-dependent countries

EWIS H. ZISKA (D) +3 authors Authors Info & Affiliations

Research Article 🙃 Open Access 💿 🕦

Potential rise in iron deficiency due to future anthropogenic carbon dioxide emissions

M. R. Smith , C. D. Golden, S. S. Myers

First published: 11 May 2017 | https://doi.org/10.1002/2016GH000018 | Citations: 36

This article was corrected on 15 JUL 2019. The online version of this article has been modified to include a Conflict of Interest statement.

GenoPalate

Empowering customers to eat healthy by assessing their genes and creating a personalized nutrition

Wellness and Fitness Services · Milwaukee, WI · 1,946 followers

Biotechnology Research · San Francisco, California · 4,940 followers

Everything starts with Philosophy & Worldview

Interpretation of reality

Relationship with the universe

Understanding of the world

Beliefs

Values

Culture

Ethics

Ideas

Relationships

Creation story

Politics

Views on history

Theology

Sociology

Law

Biology

Psychology

Economics

What is indigenous?



Belief of an inner life force within



Spiritual dimension to everything (Wairuatanga)



Sacredness of certain living things



Genealogy links us to nature (Whakapapa)



Feeling of belonging to a particular place (Ūkaipōtanga)



Reverence for elders and ancestors
(Tupunatanga)



Identity as part of a collective (tribe)



Intergenerational reciprocity
(Tauutuutu)



Distinctive rituals and ceremonies (Ritenga)



Humility (Mahaki)



Active stewardship of nature and things we treasure (Kaitiakitanga)

What is not indigenous?



Domination and control of others



Ego-based control over the forces of nature (e.g. electricity, steam, guns, nuclear)



False sense superiority that comes along with a control over nature



Material worldview which has degraded into the capitalist and consumerist



"I am the master of nature not part of it"

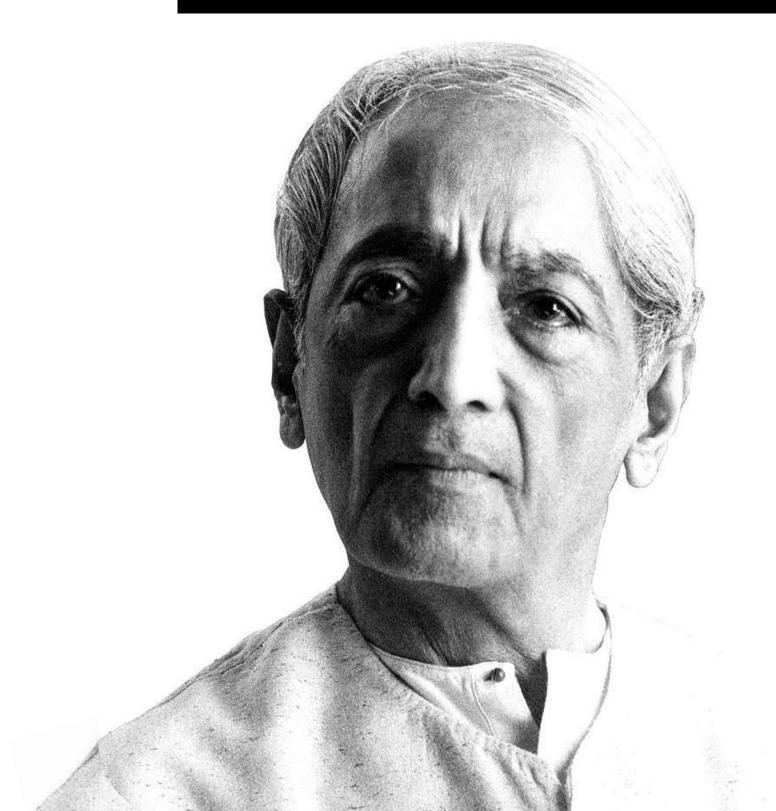


Four issues with our current model and systems

- Our systems are often based on an approach of reductionism, separation and siloes
- 2. They don't allow for the ability to hold the true complexity of reality and so they miss things

- 3. There is no recognition of, or place for spirit, mauri, intangible, infinite, immeasurable, in our models.
- 4. They are easily hijacked and manipulated by vested interests who serve themselves

Why aren't we changing our systems?



"One is never afraid of the unknown; One is afraid of the known coming to an end."

~ Jiddu Krishnamurti

Rising forces shape the nutrition ecosystem

People care deeply about where our food comes from (organics, farm to table)

Health model

& system

- Search for foods for immunity and wellbeing
- Move towards plant-based diets
- These movements are being led by the people/consumers demanding it, who have a larger voice and ability of greater choice

- Data, testing technology and wearables are informing our health decisions
- Loss of nutrients in food is increasing our need for supplements
- **Environmental CO2 and other** factors

HVN Projects innovating to combat environmental toxins

Ārepa

Public Summary

Principal Investigator: Dr Andrea Braakhuis, The University of Auckland

Collaborating Organisations: Ārepa Limited High-Value Nutrition funding: \$122,160

Development of an anti-pollution sports drink and its efficacy for active individuals





Public Summary

Principal Investigator: Dr Odette Shaw, Plant & Food Research | Rangahau Ahumāra Kai

Collaborating Organisations: Anagenix (Industry Partner)

High-Value Nutrition funding: \$651,553

BerriQi - Delivering immune defence

There is potential for a patented New Zealand boysenberry and apple formulation to help the immune system pollutant-mediated lung inflammation in humans. Air pollution in large Asian cities is a significant consumer co

Setting intention

Philosophy & worldview Health model & system

The nutrition ecosystem

Comparative Study > J Am Coll Nutr. 2004 Dec;23(6):669-82.

doi: 10.1080/07315724.2004.10719409.

Changes in USDA food composition data for 43 garden crops, 1950 to 1999

Dirt Poor: Have Fruits and Vegetables Become Less **Nutritious?**

Abstract

Objectives: To evaluate

Donald R Davis 1, Melvin

Affiliations + expand

PMID: 15637215 DOI: 1

EXTENSION® The Science of a Healthier Life®	search for products and health information or by item #					n richer in vitamins and minerals
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Vegetables without Vitamins						netical
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Scientifically reviewed by: Dr. Gary Go

GeoHealth

Research Article 🖸 Open Access 🚾 🕦

Potential rise in iron deficiency due to future anthropogenic carbon dioxide emissions

M. R. Smith X, C. D. Golden, S. S. Myers

Environmental trends: The great nutrient collapse Top soil and its degradation **Environmental CO2 Rise**

- 6% decline in protein content
- 9% decline in phosphorus
- 15% decline in iron
- 15% decline vitamin C (Ascorbic Acid)
- 16% decline in calcium
- 18% decline in vitamin A
- 38% decline in vitamin B (Riboflavin)

Global Landscape - Direct to customer

Key theme: Moving from just products to developing platforms

B2C models at play:

- 1. Assessment-based services
 - a. are the broadest and fastest-growing personalized nutrition category
- 2. Genetics-based personalization services
 - a. are improving in accuracy, reducing in cost and offering 'Netflix-style' subscriptions.
- 3. Biomarker-based services
 - a. allow brands to tackle a wider range of health problems and offer nutrition solutions

- 4. Microbiome-based services
 - a. are information-rich but likely limited due to the need for stool samples.
- 5. Nutrition from food meals
 - a. Personalisation of meals and delivery.
- 6. High End Bespoke Health and Nutrition services
 - a. These are in person clinics that are usually only accessible to the wealthy class.
- 7. Al & Data Mining
 - a. Data analytics and machine learning is building a big competitive advantage for companies.

In this category, consumers provide personal

gender) to more complex (like medical history,

diet restrictions, food allergies) to get a more

information, from basic (like height, weight,

Assessment-based services

personalised experience.

Health model & system

The nutrition ecosystem

The frontiers

GAINFUL

A routine tailored to you

We'll help you create a health plan with vitamins, supplements, and more that help you feel your best today and support you long-term.



Zain's plan

Graphic designer

Zain is up early most mornings, travels frequently, and is looking to cover his bases.

ABOUT US

SIGN IN

ELDERBERRY for immunity*

SCIENCE

A personalized nutrition system

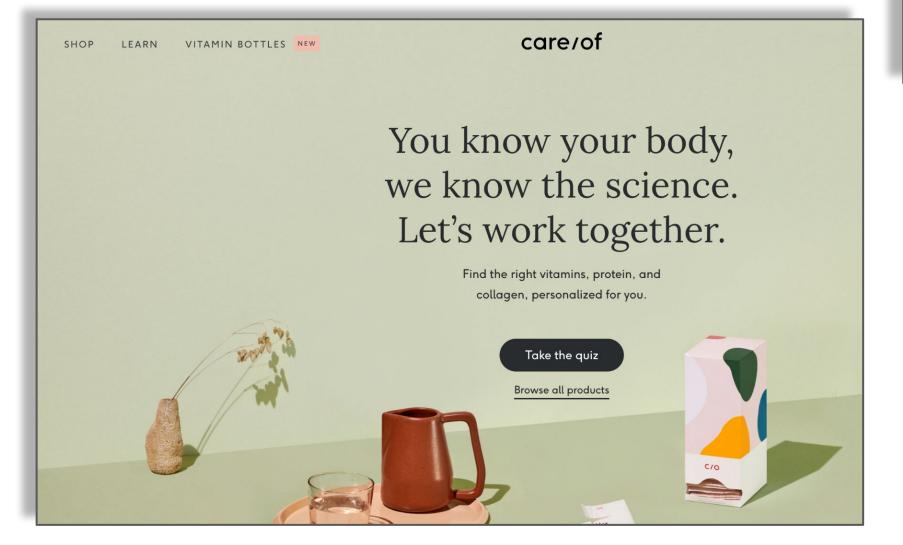
that works for you

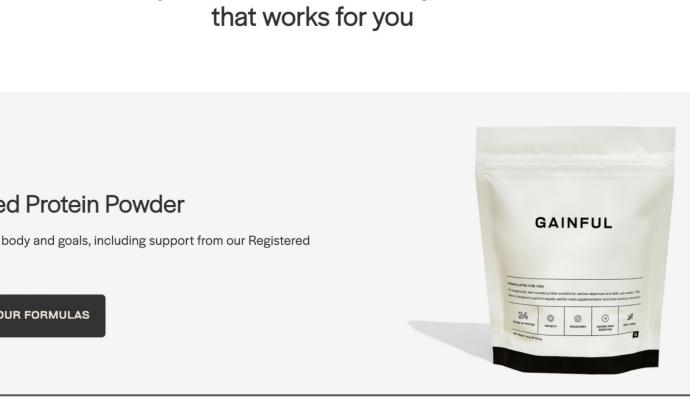
INGREDIENTS

Personalized Protein Powder

Formulated for your body and goals, including support from our Registered Dietitians.

PERSONALIZE YOUR FORMULAS





REFER FRIENDS REGISTER KIT CONTACT

TEST

NA Test Kit

Personal

REPORT

Eat like a pro.

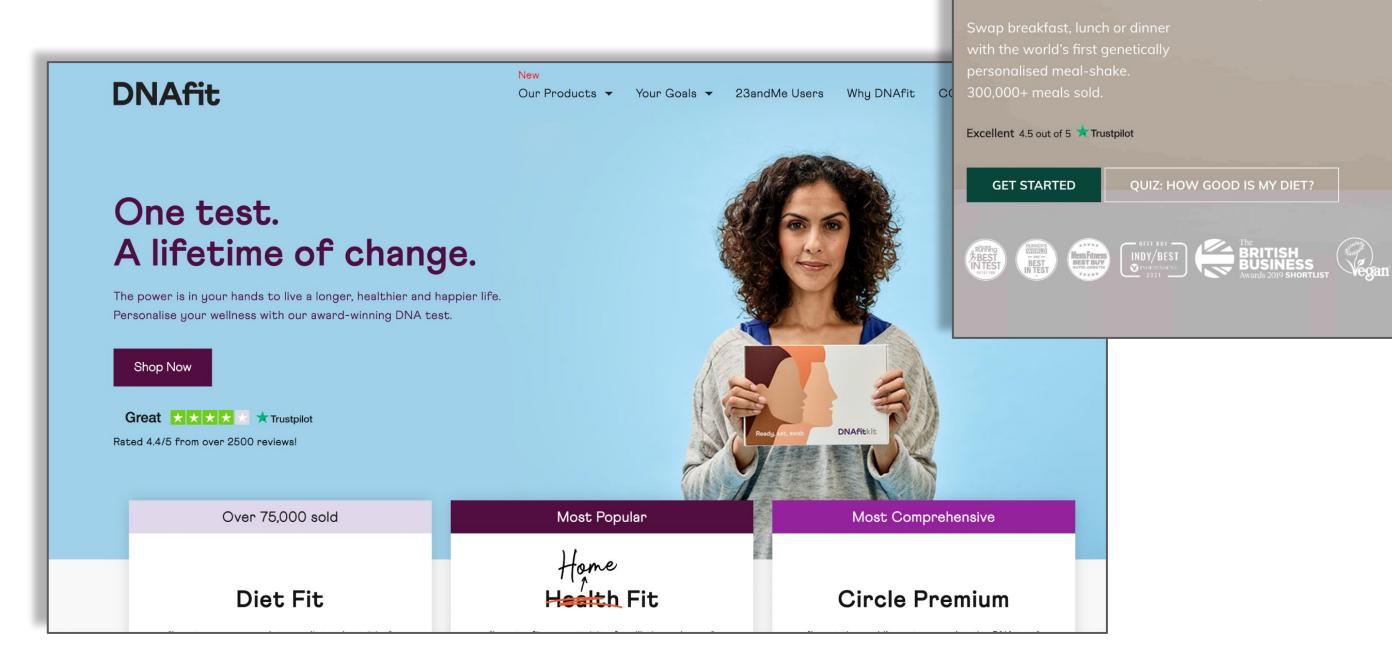
Get results like a pro.

NUTRITION

2. Genetics-based personalisation services

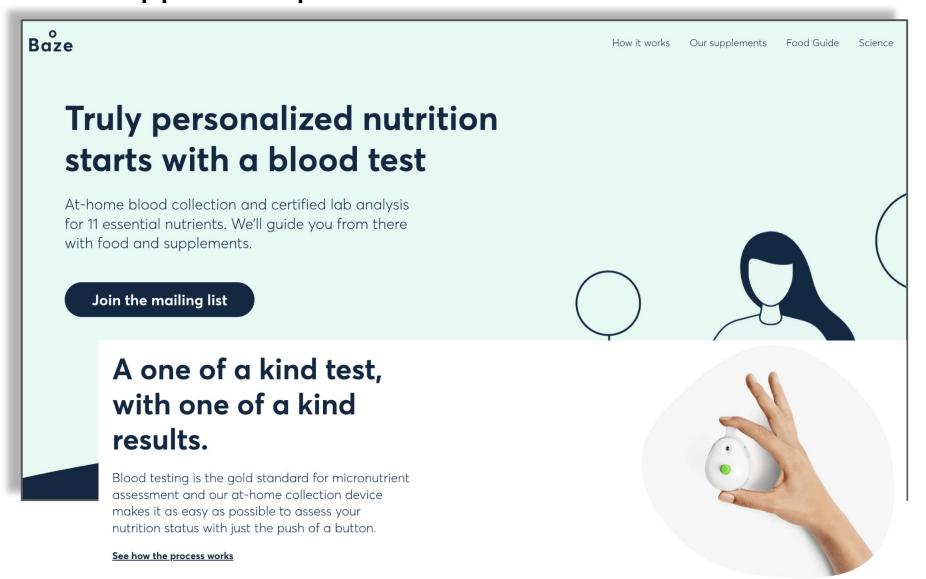
Involve consumers providing a saliva swab to assess genetic information linked to health or fitness.

Services vary from complete nutrition programs to providing health reports and supplements based on DNA.

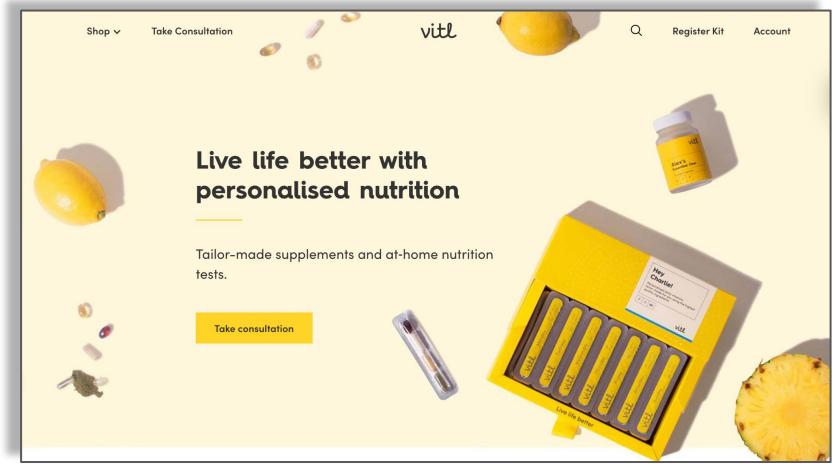


3. Biomarker-based services

Ireland's Food Marble uses a home device that monitors hydrogen in the consumer's breath and makes suggestions to improve gut health. UK's Vitl and Germany's Baze monitor blood levels of common micronutrients, such as folate, iron, vitamin B12 and vitamin D to create monthly, bespoke vitamin, mineral and supplement packs.







Health model & system

The nutrition ecosystem

The frontiers

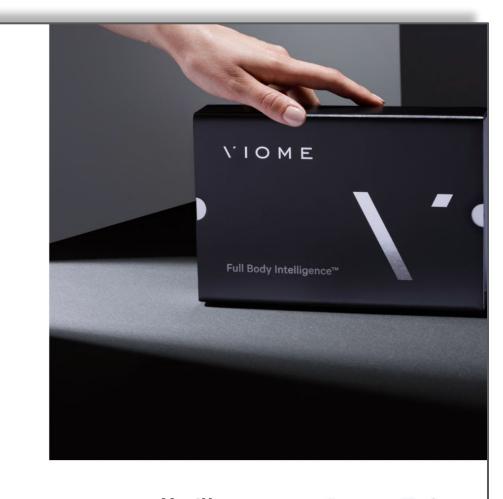
4. Microbiome-based services

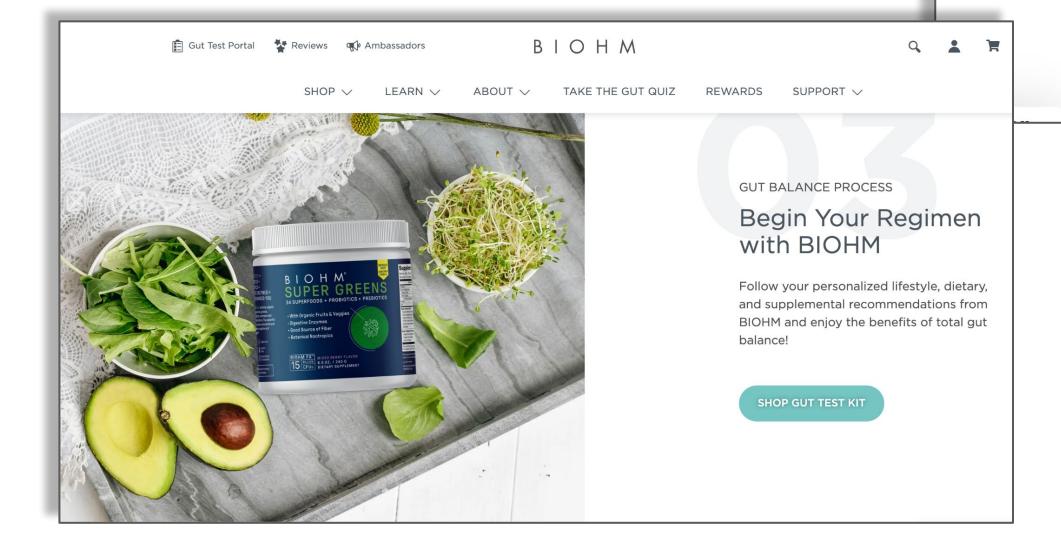
To fully understand gut health from a micro-organism level, consumers can provide a stool sample which is analyzed for the presence of different microbial DNA and health recommendations can be made. Brands such as the US's Viome and Biohm lead in this category.

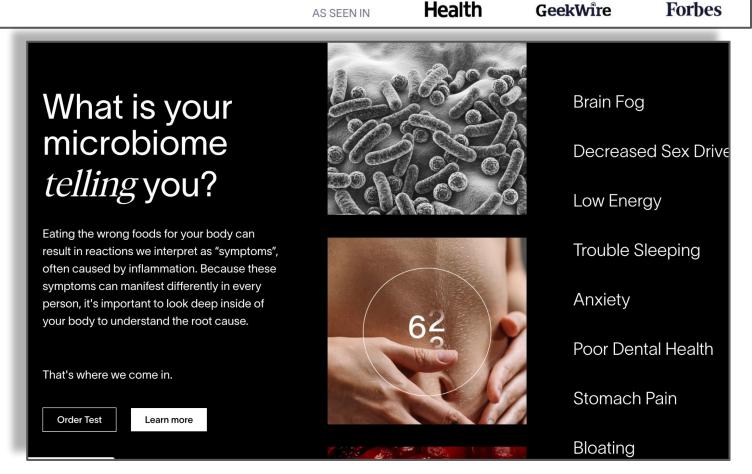
You, decoded.

Advanced microbiome insights and personalized nutrition for holistic health benefits.

Order a test







5. Nutrition from meals and Habits Forming

Multifaceted habit formation tools and interventions for initiating & maintaining health behavior change. More hands on support in planning meals from dieticians and health coaches with addition of full meals + super foods delivered to your weekly.





Sign In



How Thistle Benefits Your Health

Thistle food doesn't just taste good – it benefits your everyday life! We pay close attention to the balance of vitamins and other nutrients to fulfill your health needs.

More Energy

Thistle's food contains low-glycemic carbs and protein-rich ingredients to promote even energy-burn. No spikes!

Less Bloat

Thistle uses high fiber, low sodium food to reduce inflammation and promote blood flow to your digestive system.

Sharp Mind

Thistle uses healthy fats + omega fatty acids to fuel your brain, combatting stress and balancing hormones.

About ~

Clear Skin

Thistle is low in sugar and rich in antioxidants, biotin + beta-carotenes to hydrate skin and slow aging.

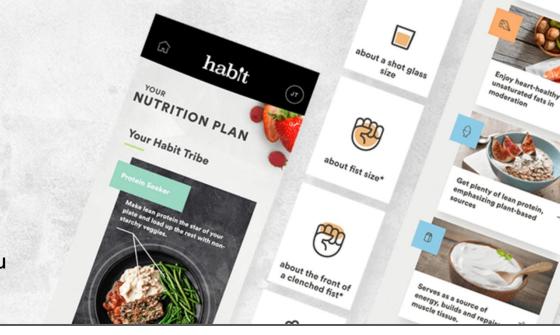


Healthy Eating and Living Well. Simplified.

Habit Food Personalized nutrition need based meals hand-crafted by chefs, help you eat right at home and on the go.

Know what to eat

Get a clear view of which foods we recommend for you and why.



whole spine scan, exercise stress echocardiogram, movement screen, strength and

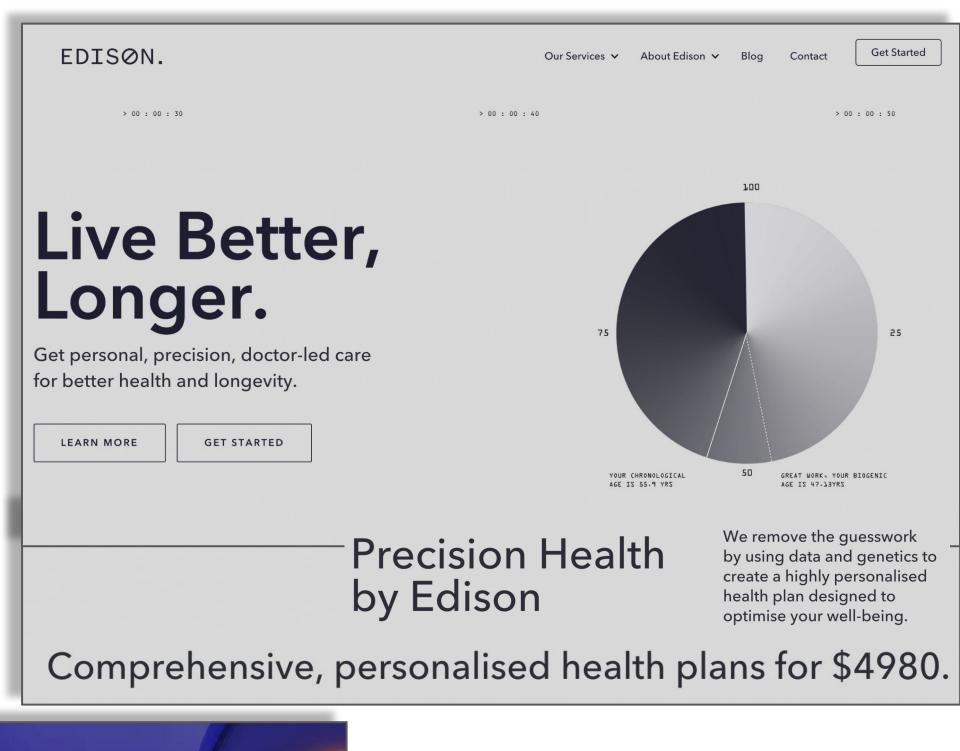
conditioning session and comprehensive blood testing. This sports focused

assessment lasts around 6 1/2 hours.

6. High End Bespoke Health & Nutrition services

Services offered to high networth individual as ways to increase lifespan and and healthy aging. Also being pitched to big corporations as looking after key individuals within a workforce can result in significant benefits to a company.





INTEGRATIVE

PHENOMICS

brightseed

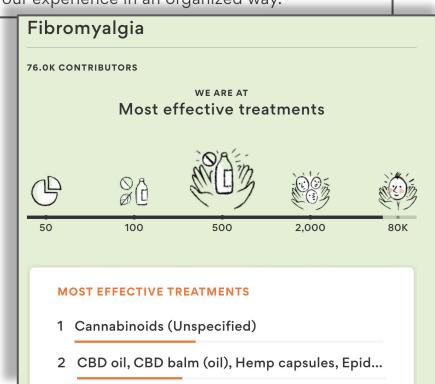
7. Al & Data Mining

Data analytics and machine learning is building a big competitive advantage for companies.

Stuff That Works.

We're building the biggest patient reported knowledge base for every chronic condition. Together.

Help out by sharing your experience in an organized way.



The next health frontier

Illuminating Connections

Brightseed's core Al technology is Forager, the world's largest digital platform that illuminates the interaction between plant bioactives and human biology. Forager is the only technology capable of predicting which plant compounds are bioactive and how they impact specific health areas.





Limitless health applications

















INTEGRATIVE **PHENOMICS**

Understanding the complexity of your gut microbiome to provide Al-driven personalized nutrition recommendations.

Setting intention

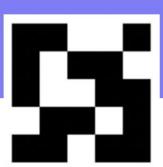
Philosophy & worldview

Health model & system

The nutrition ecosystem

The frontiers

You can chang

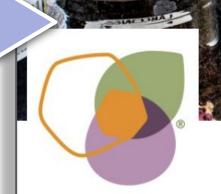


Journey Foods

JourneyFoods

Technology that improves food science and supply chain inefficiencies in order to feed 8 billion people better.

Software Development · Austin, Texas · 2,952 followers



Brightseed

We're on a mission to illuminate nat Biotechnology Research · San Francisco



Impossible Foods

We make meat from plants.

Atlas Biomed

Optimise your nutrition with genetic insights from the Atlas

Biotechnology Research · London, England · 1,725 followers



foodvisor





GenoPalate

Empowering customers to eat healthy by assessing their genes and creating a personalized nutrition and eating plan

Wellness and Fitness Services · Milwaukee, WI · 1,946 followers



DayTwo

Precision Nutrition for Metabolic Disease

Health and Human Services · Brentwood, Tenness



EVERYTM

You're unique. It's time

you started eating that way.

Creating Vital Ingredients For The World

Food and Beverage Manufacturing · South San Francisco,





Foodvisor

Your personal nutrition guide

Wellness and Fitness Services · Paris, Ile de France · 2,842 followers



zoe

ZOE

We're on a mission to improve the lives of millions.

Technology, Information and Internet · London, Select One... · 8,119 followers



BIOMES

Genomics-based Healthcare Prevention: Because wellbeing is coded in our DNA.

Wellness and Fitness Services \cdot Wildau, Brandenburg \cdot 1,206 followers

Setting intention

Philosophy Health model & worldview & system

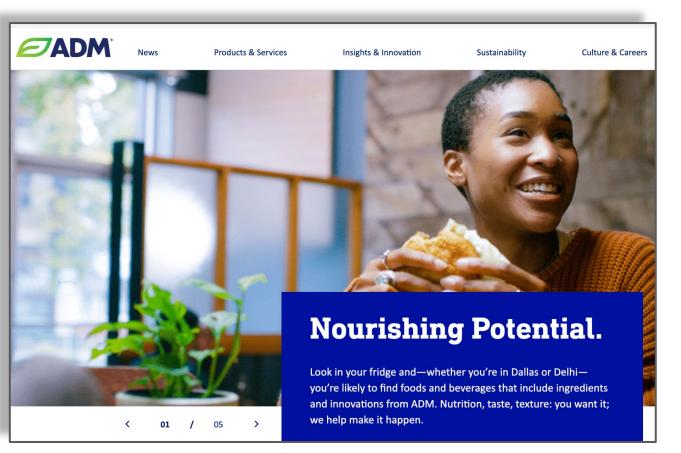
The nutrition ecosystem

The frontiers

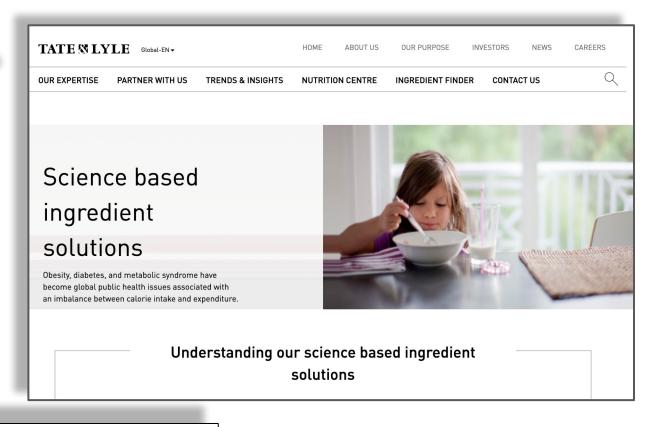
B2B Models

1. Private Commercialisation partners

- a. There are very big companies in this space
- b. There are many mergers and acquisitions happening all the time
- c. They are owning the whole value chain (growing, processing, extraction, science, consumer products)



Revenue: \$3.25b USD (2021)





Revenue: \$3.83b USD (2021)

34,000⁺

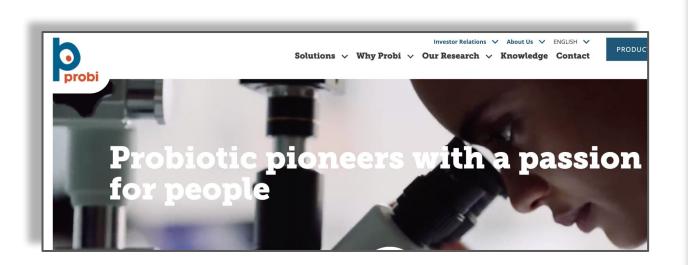
products

 $6,000^{+}$

customers

150⁺

countries





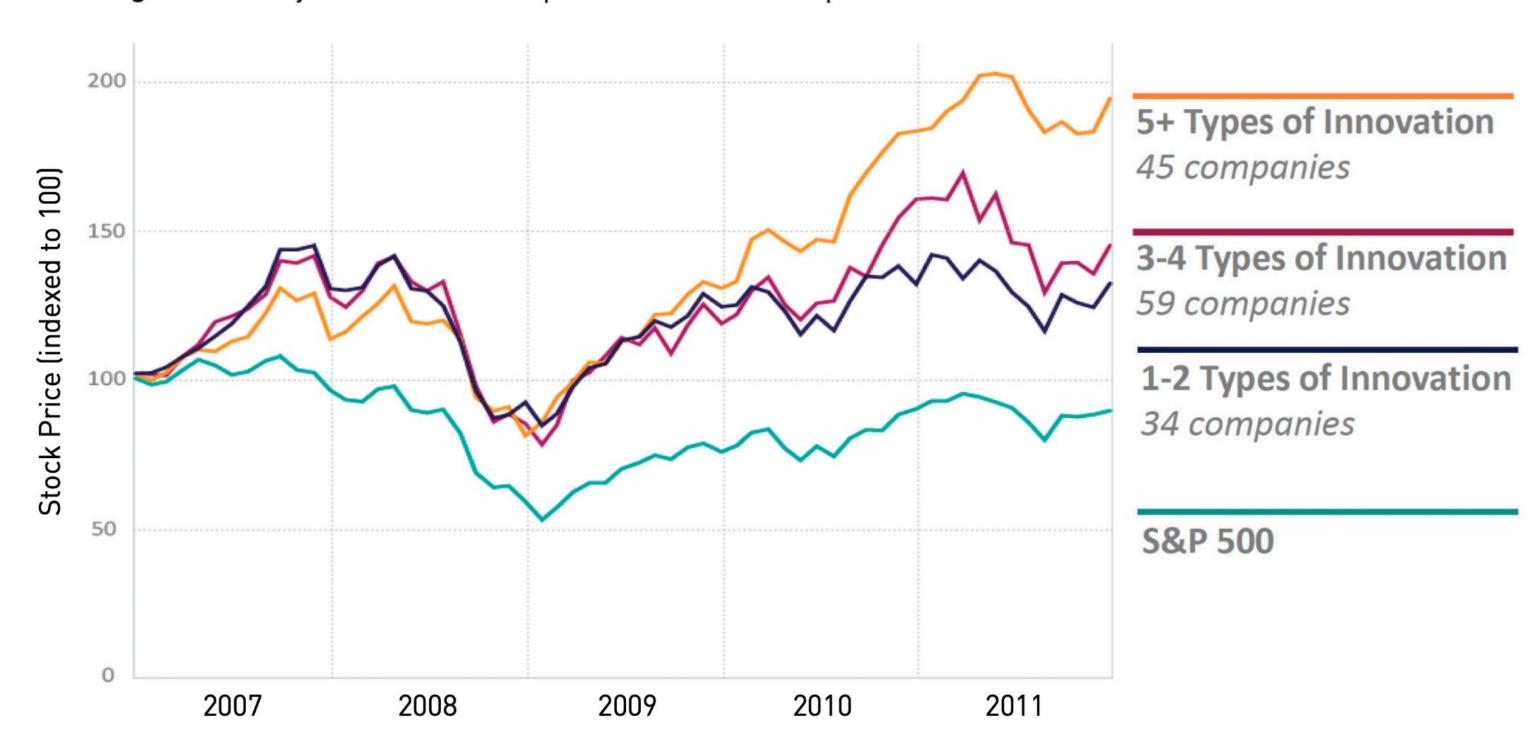
Revenue: \$85.25b USD (2022)

The 10 types of innovation

CONFIGURATION	Profit Model	Make money	Gillette, Hilti	ENTER
	Network	Connect with others to create value	UPS, GSK, Toshiba	⊙ TARGET
	Structure	Align your talent and assets	Mc Do, Fabindia	WHÖLE
	Process	Use Superior methods to do your work	Zara Ikea	ZARA
OFFERING	Product Performance	Employ distinguish features and functionality	Dyson, Mars, Inuit	Mars
	Product System	Create complementary products and services	Microsoft, Scion	Microsoft
EXPERIENCE	Service	Support and enhance the value of your offering	Zappos, Car Glass, Sysco	Zappos
	Channel	Deliver your offering to your customers and users	Nespresso Amazon	NESPRESSO
	Brand	Represent your offering and business	Intel, Virgin	No per
	Customer Engagement	Foster interaction	Apple Foursquare	Wii

Innovation return on investment

Figure 3. Five-year indexed stock price returns of the top innovators vs. S&P 500



Evolution of the Māori economy

3 F's of the traditional Māori economy





Fishing - 37% of New Zealand's domestic fishing quota



Farming - 10-15% of national sheep, beef and milk solids production



Forestry - 36% of pre-1990 forests

3 F's of the emerging Māori economy



Food





Film





Fashion

The frontiers

Embodying the insights













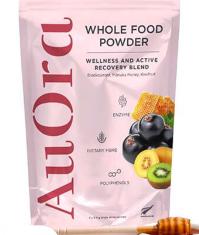




















torere





The emerging story

- We are nature
- Begin with the healing of our own people
- Empower and educate people as partners on healing journey
- Building platforms, not just products
- Rigorous testing is critical for preventative health

- Combine multiple indigenous and Western health systems
- Building healthy habits through community
- Healthy body begins the deeper inner healing journey
- Our healthy people are our salesforce

Setting intention

Philosophy & worldview

Health model & system

Induction

The nutrition ecosystem

The frontiers

Embodying the insights

Our work, our people

The approach our nutrition venture is taking

Testing

Qualitative and quantitative tests and diagnostics of 20 different biomarkers

Testing

Analysis

Analysis

Analysing the data and creating visual reports to summarise the findings and link results to symptoms

Induction

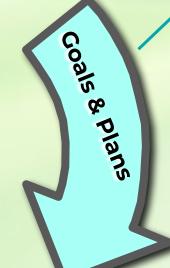
Building understanding around health and their own role in the programme journey



Community &

Balance & Beyond

Identifying changes to biomarkers and mapping progress made



Goals & Plans

Personalised wellbeing ecosystem created with individual plans around food recommendations, natural and indigenous medicines and supplements

Selection

Identifying those facing health concerns that fit the pilot programme criteria



Habits & Community

Reminders to build habits

- + sharing with others
on the journey

Medicinal Herbs

Medicinal Herbs

Procuring for you the best quality natural medicines and supplements

Our sincere requests from the ecosystem:

Help determining the most appropriate set of biomarkers to include in our tests to provide a sense of a person's state of health

Philosophy

& worldview

- Insights around nutrition and supplements to improve these biomarkers
- 3. Which specific brands of supplements you recommend we procure and provide

- 4. People with verified knowledge of the bioactivity of natural compounds (e.g. plant medicines, foods)
- 5. Those with access to lab facilities to do nutrition testing of NZ foods
- 6. Experts in the ecosystem who might be interested in helping our project
- 7. Those interested in contributing to an education series of workshops with our pilot group



Shay Wright

shay@growthcycle.co.nz



Vinny Lohan

vinnylohan@gmail.com

