

EXPANDING FROM DAIRY TO ALTERNATIVES – INDUSTRIAL RESEARCH PERSPECTIVE



HealthFerm

Final conference
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RIITTA PARTANEN
Head of Research, Valio Ltd

FOOD2.0 | 



MARKET LEADER

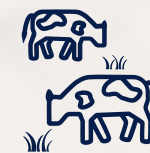
In dairy products in Finland



EXPORT TO
60
COUNTRIES



OWNED BY
3,000
DAIRY FARMS



13
COOPERATIVES



12 + 2
PLANTS
in Finland
and Estonia



4009 + 627
VALIO PEOPLE
in Finland and
around the world



2,4 BN
TURNOVER



1,6 BN
LITRES OF
MILK
from farms



**TOWARDS
CARBON-
NEUTRAL**
milk chain 2035



**PROFITS TO
FARMS**
through milk price



5 – 10
PATENTS
or innovations
yearly



SUSTAINABLE FOOD SYSTEMS NEED TO BUILD ON LOCAL CONDITIONS

- Cool and wet climate is suitable for grass cultivation and dairy farming



- Yet, more plant-based is needed, especially pulses to support crop rotation and nitrogen supply as well as the dietary shift towards more plant-based
- Oats is a traditional ingredient for Finnish food industry, but basic understanding and value chain need to be developed to meet the requirements of new type of products



DAIRY HERITAGE – DIVERSE FUTURE

OWNERS

- Global dairy consumption is in steady growth, but shifting to export markets
- Plant-based categories for drinks, snacks and proteins are developing at home markets

→ Willingness to invest – "both and" instead of "either or"

PROCESS INFRASTRUCTURE

- Wet processes for liquids and semi-solids
- Industrial application of enzymes and fermentation

→ Solid particles, drastic viscosity changes, CIP requirements

KNOWHOW

- Knowhow on whole chain from farm to customer
- Raw material with extensive scientific literature & industrial experience of safety, functionality etc.

→ New raw materials with only specs-level data and constantly evolving manufacturing processes

PUBLIC IMAGE



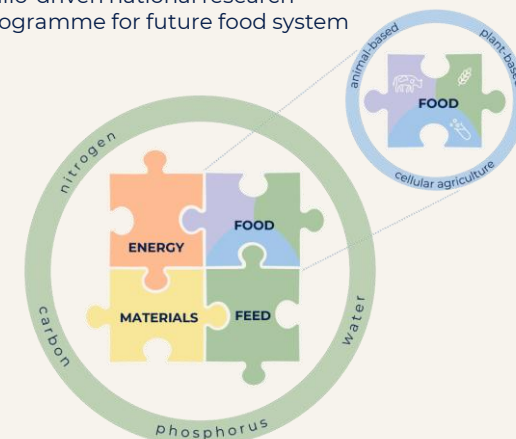
Meat alternative brand



Dairy alternative brand



Valio-driven national research programme for future food system



DAIRY YOGURT AS GOLDEN STANDARD – THE ORIGIN OF DIFFERENCES



PhD thesis by Maija Greis, Valio, UH and UMass Amherst in collaboration

Greis et al., Physicochemical Properties and Mouthfeel in Commercial Plant-Based Yogurts, Foods, 2022, 11, 941.

Property	Dairy	Plant-based
Gel type and structure recovery	Particle gel formed of caseins micelles: strong hysteresis in flow curves	Polysaccharide (molecular) gel: faster recovery, pronounced with higher dry matter content
Buffering capacity	High due to Ca phosphate and typically higher protein	Same pH with much less acid
Fat melting	Milk fat melting in mouth	Liquid oil, no melting sensation
Fermentation	Sugars readily available	Added sugars / hydrolysis/ new starters needed /

There is little generic in the physico-chemical properties of commercial plant-based oatgurts

OATGURT AS A SOURCE OF PROTEIN AND FIBER?

		Fat g/100ml	Carboh. g/100ml	Sugar g/100ml	Fiber g/100ml	Proteins g/100ml
YOGURT	D1	2.5	4.1	4.1	0.0	4.2
	D2	4.0	4.1	4.1	0.0	4.0
	P1	2.2	9.9	4.6	1.3	1.7
OATGURT	P2	2.4	11.1	5.2	1.0	0.8
	P3	2.5	9.2	4.8	na [*]	1.0
	P4	0.8	8.2	2.3	0.0	2.2
	P5	1.9	12	2.5	0.13	2.1

*na = not available.

Greis et al. Dynamic texture perception in plant-based yogurt alternatives: Identifying temporal drivers of liking by TDS, Food Quality and Preference 86 (2020) 104019



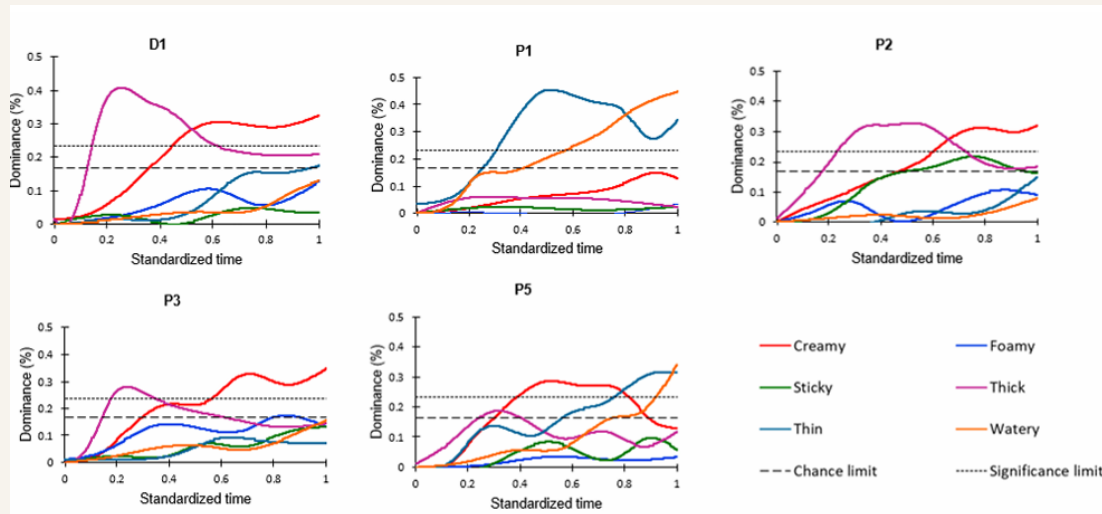
Need for



project

PERCEIVED TEXTURAL DIFFERENCES

Temporal dominance of sensations during eating



Products	Overall liking			Mouthfeel liking		
D1	5.2	± 1.4	a	5.6	± 1.2	ab
D2	5.7	± 1.4	a	6	± 1.2	a
P1	2.4	± 1.3	c	3	± 1.6	d
P2	3.8	± 1.8	b	4.6	± 1.8	c
P3	3.7	± 1.8	b	4.9	± 1.7	bc
P4	3.3	± 1.6	b	4.3	± 1.5	c
P5	3.3	± 1.7	b	4.4	± 1.5	c

n=87

Greis et al. Dynamic texture perception in plant-based yogurt alternatives: Identifying temporal drivers of liking by TDS, Food Quality and Preference 86 (2020) 104019

COMPLEX OPTIMISATION TO SPARK CONSUMER INTEREST

TASTY = if taste does not meet the expectation, nothing else matters

DRIVERS OF
TRANSITION

REFINING

MUST HAVE
for VOLUME
= IMPACT

HEALTHY = keep the goodies,
get rid of the antinutrients

SUSTAINABLE = less refined
means less side streams, water, energy
and chemicals

AFFORDABLE = we live
in world of technological
opportunities, almost anything
is possible but how to make it
feasible and affordable



THANK YOU!