



**VTT**

# **Digitalisation shaping the consumer landscape**

**Prof Nesli Sözer**

Digital Transformation of the Agricultural  
Value Chain – Opportunities, Challenges  
and the Role of Science virtual conference  
2 – 3 December 2020

01/12/2020 VTT – beyond the obvious

# VTT Technical Research Centre of Finland

## We make impact through science and technology

### Our vision

A brighter future is created through science-based innovations

### Our mission

We help our customers and society to grow and renew through applied research

### Our strategy

We make an impact through scientific and technological excellence

**245 M€**

turnover of which 47 %  
from abroad

**2,103**

employees

**406**

patent families

**9%**

of the world's Gartner  
Global 500 companies  
have partnered with VTT



**Planet earth has a  
dinner reservation for  
10B people in 2050.**



**Demand for  
water**

**1.6** times

**Demand for  
energy**

**1.8** times

**Demand for  
food**

**1.7** times

**By 2050, human society will require  
two times the Earth's resources**

# ”Data is the fuel and analytics is the engine” of smart and sustainable food production system

## Data driven elements of smart and sustainable food production:

- Hyper-personalization
- Hyper-local sourcing & distribution
- Platforms & Crowds
- Food & ingredient technologies

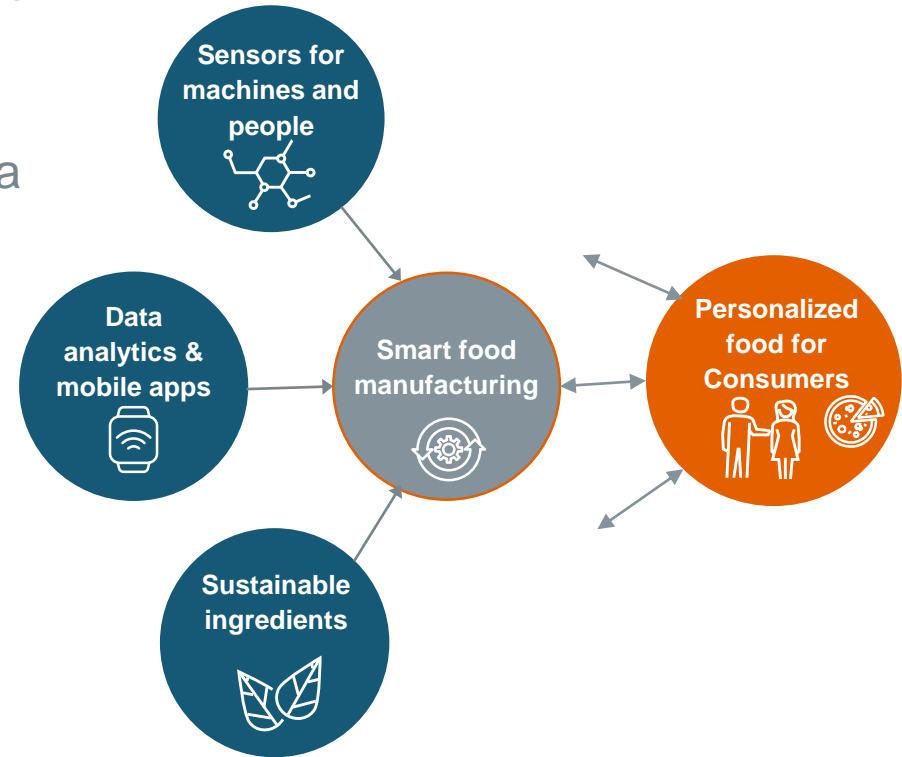
# Even identical twins response the same food differently\* so why do we force in one size fits all approach to our eating and diet?

\*Based on a large-scale nutrition research project carried out with 14,000 twins with a 25-year investigation of health and lifestyle at King's College London.



# Hyper - personalized food

- **Environmental and wearable personal sensors** for collecting data
- **Data-driven system and smart mobile apps** for guidance and recommendations
- **Next generation smart food machines** produces fresh, healthy and personalized foods.



”Made  
for me!”

Sensorization of  
things is the key  
towards hyper-  
personalized food

# 75,4 B connected IoT devices by 2025

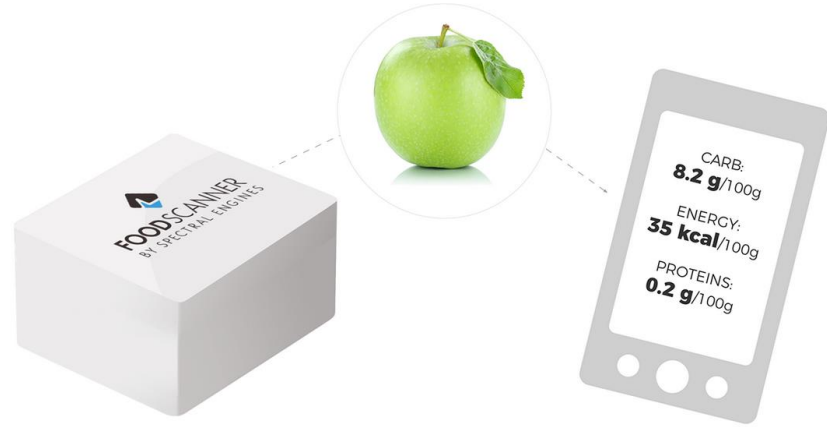
AI optimized data platforms can assist in not only to optimize the food production from farm to fork but also can enable development of new hyper-personalized foods.





# Sensorization of things: FOOD

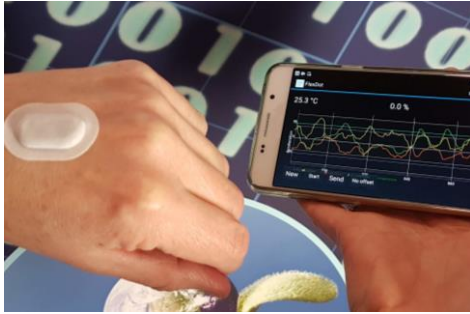
- FoodScanner combines near infrared spectroscopy, along with a Bluetooth connection to a mobile device and data connection to a cloud server
- Foodscanner identifies total energy, macro- and micro-nutrients.
- Clear and easy-to-understand user interface on your smart phone.



**Spectral Engines**  
**VTT spin off**

[www.spectralengines.com](http://www.spectralengines.com)

# Sensorization of things: ME



## VTT Flex Dot

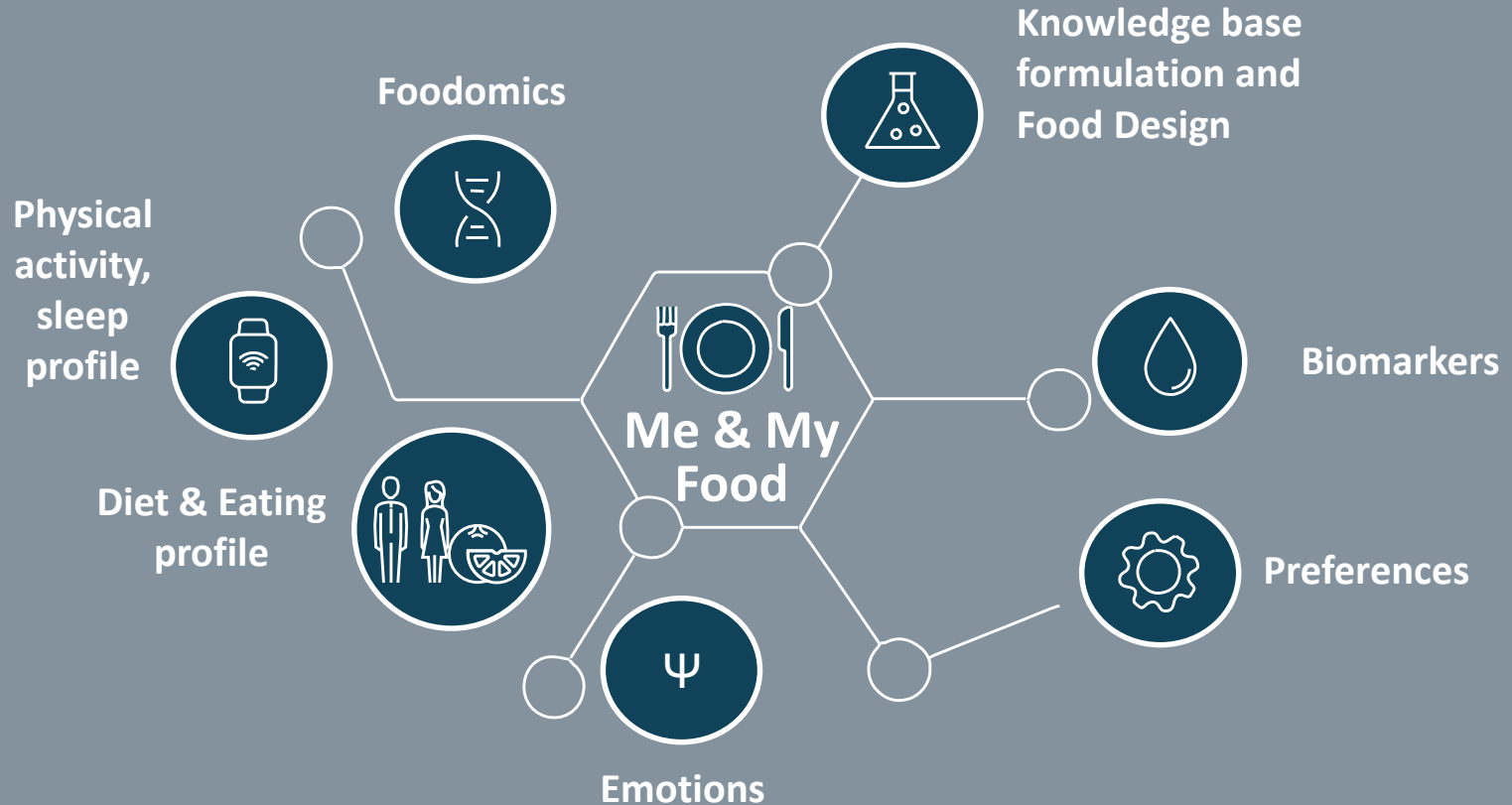
Unobtrusive motion sensing and recording. Easy to customize for other needs



## VTT Stretch Node

Elastic wireless sensor platform for health and well-being applications

# The Me & My Food -concept



# Impact of Covid 19 pandemic on consumers food behaviour

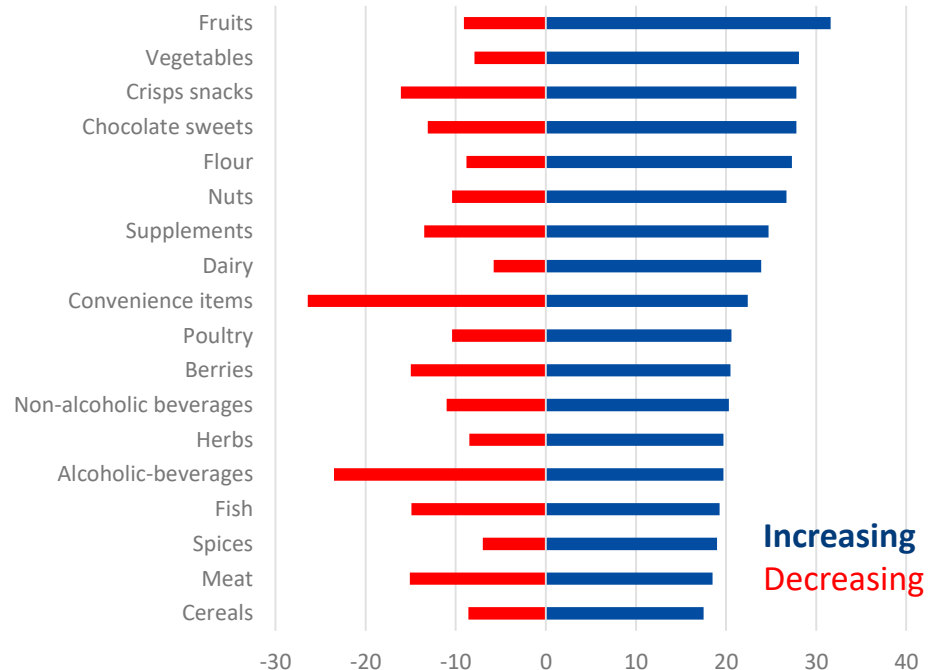
# Covid 19 study: EU Food Behaviours funded by EIT Food

- The project was coordinated by Aarhus University and carried out by the EIT Food Consumer Task Force, consisting of Aarhus University, IATA-CSIC, Queens University Belfast, University of Helsinki, KU Leuven, University of Warsaw and VTT.
- Data collection was conducted in 10 European countries (Spain, Sweden, Germany, UK, Poland, Italy, France, Greece, Finland, Romania). The majority of the data was collected in September 2020. A total of **5,000 adult consumers** (18+) were surveyed, meeting the criteria of being responsible or co-responsible for grocery shopping.

# Covid 19 disrupted the food shopping

- Sharp increase (ca 45 %) in food shopping online
  - Home delivery accounted for the majority
- Equally large increase in bulk shopping
- Consumers purchased more in almost all categories except alcohol and convenience foods!

Possible changes in product consumption during the Covid-19 pandemic.



# Choices were driven by sustainability & health



- **Almost half of those surveyed (49%) said protecting their health is more important as a result of the pandemic !**
  - More local foods
  - Less food waste
  - Buying unpackaged or biodegradable-wrapped products for environmental reasons
  - Buying more packaged goods because of hygiene concerns
  - Avoid artificial additives and preservatives
  - Dieting for weight control

# New value through local and distributed manufacturing

- How to operate with shorter supply chains and home delivery from field to home ?
- How do we move away from cascaded distribution channels and long delivery times to direct production and delivery to the consumer in less than 24h ?
- How to enable local personalized food manufacturing and distribution ?



# Online food delivery services and "ghost kitchens" sky-rocketed

- Only handles online delivery orders.
- A new way to manage the demand for delivery.
- Ghost kitchens can reduce rent and labor costs for restaurants, to the cost of sharing a portion of their delivery profits.

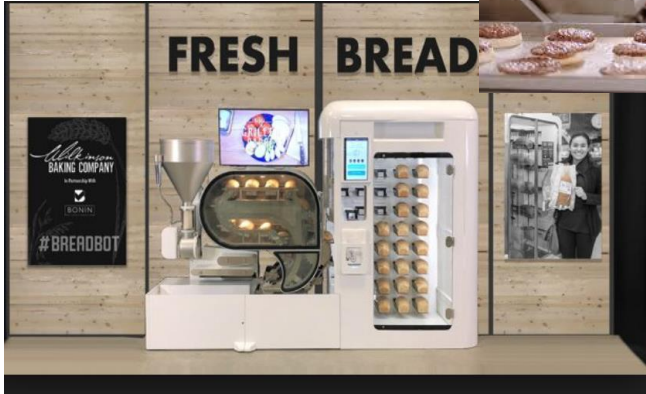


# Robots taking over the humanless or contactless outdoor food delivery

- In use for ground delivery
  - Starship (Estonia)
- In development for delivery
  - Teleretail (Germany/Switzerland/US)
  - Marble (US)
  - Robovan (Daimler, Germany)
  - Vision Van (Daimler, Germany)



# New smart machines for personalized and local food production



# FOOD MY WAY : Next generation smart snack machines to produce fresh, healthy and personalized food from semi-finished ingredients, at work or on-the-go

VTT



## Take home message

Harnessing food related data and digitalization from farm to fork will not only enable smart and sustainable production but also can create new business opportunities by catalyzing production for the individual.

# THANK YOU!

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