

# **NUTRITION FOR A BETTER LIFE**

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**Executives International  
Hotel Aquatis, Lausanne  
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# A short walk through history & food preparation



# The food system before the food industry

All food local

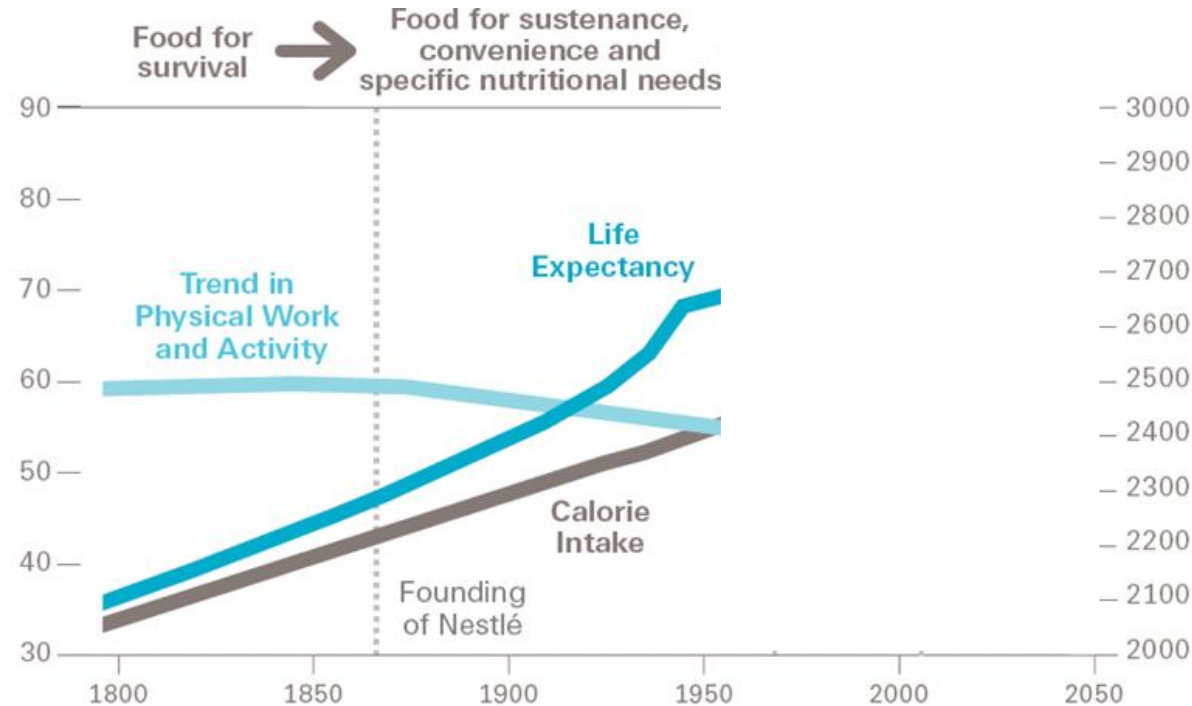
No (chemical) plant protection

No transformation (beyond milling, baking)

Only very simple forms of conservation

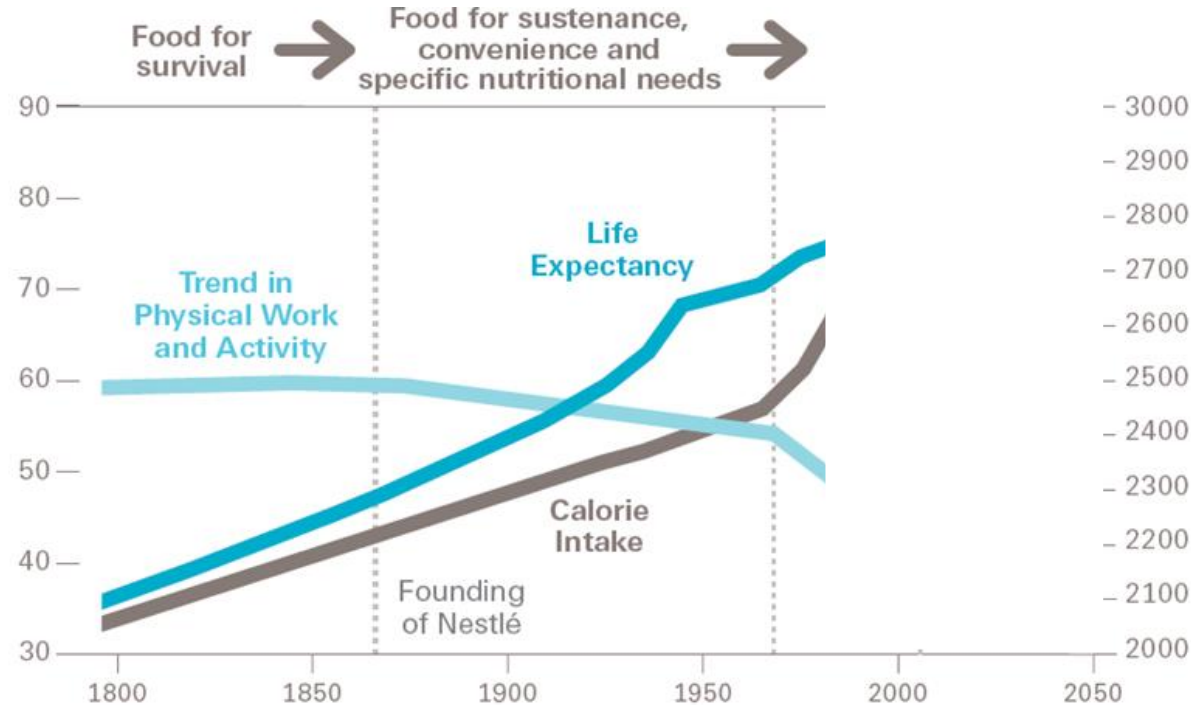


# Improvements with economic progress: calorie intake and life expectancy

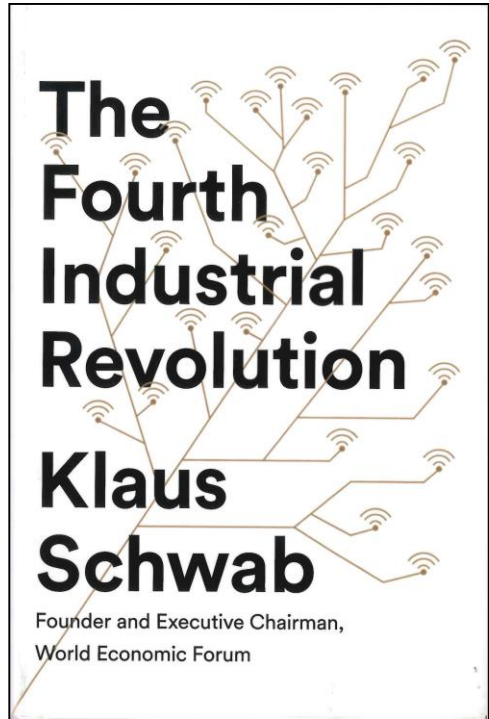


Source: Nestlé CT-ENT

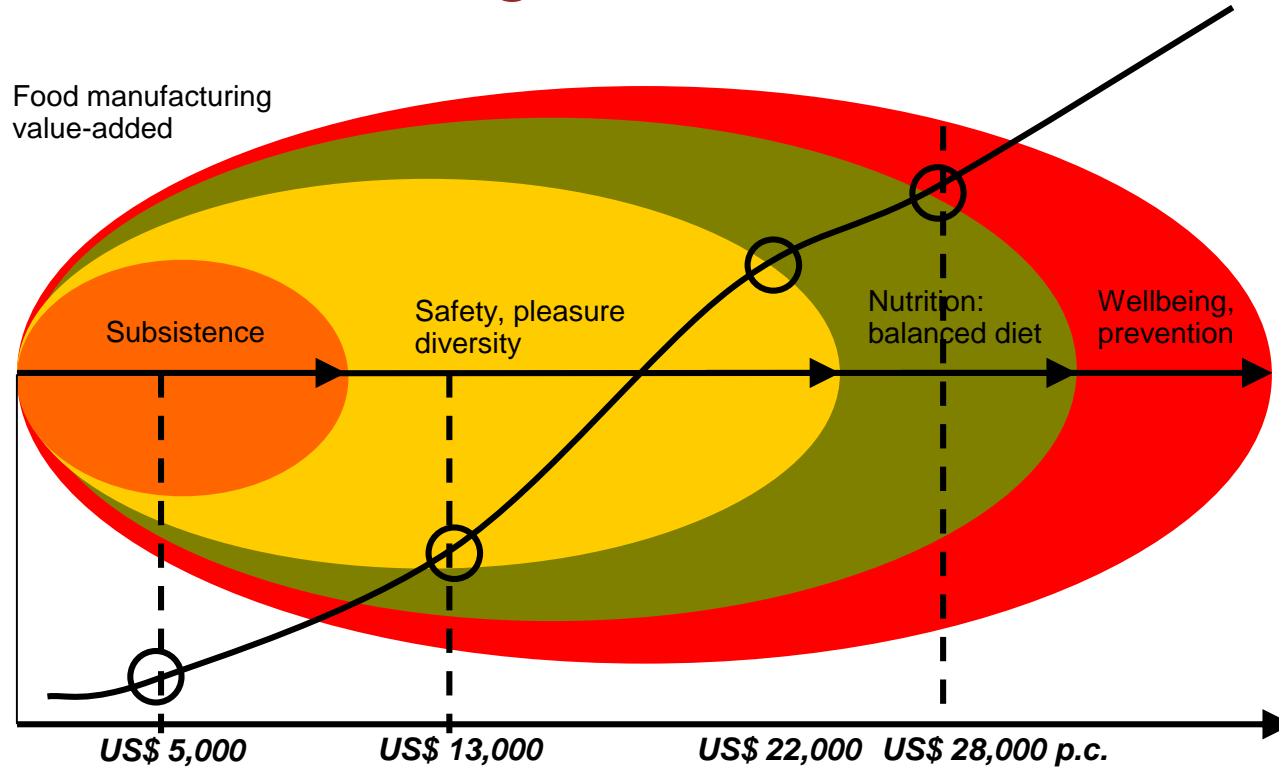
# Increase in life expectancy: levelling off?



Source: Nestlé CT-ENT



# Evolution of the global food market – spending on food manufacturing value-added and GDP p.c.



Sources: UNIDO (value-added), WIDER and World Bank; Nestlé F&C; analysis EIR

# The Healthcare world in 2020 ...



## ... 1 out of 5 will be over 65

- 70% of developed countries with more 50+ than 50-
- Over 200M people aged 65+ in China
- Requires healthcare systems better adapted to needs of the elderly



## ... 3 out of 5 will die from a chronic disease

- 50M Alzheimer's patients
- 7% of the world's adult population will live with diabetes
- More emphasis on prevention and treatment of chronic diseases



## ... 1 out of 5 will be overweight or obese

- 120M people in the US
- 20% of people under 18 year in China
- Need to treat increasing co-morbidities such as cardiovascular diseases and diabetes



## ... US\$ 5 to 10 Trillion will be spent on healthcare

- More than 16% of GDP spent on healthcare
- National health expenditures in USA per capita will reach US\$ ~14'000
- Requires radical ways to contain costs and/ or increase available funding

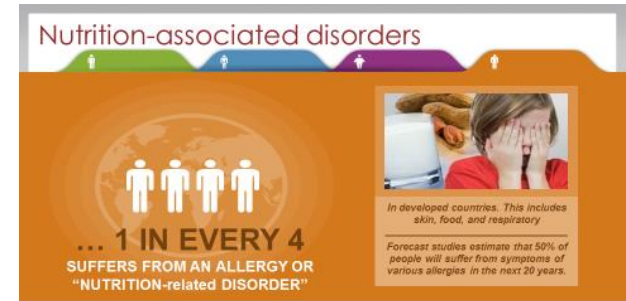
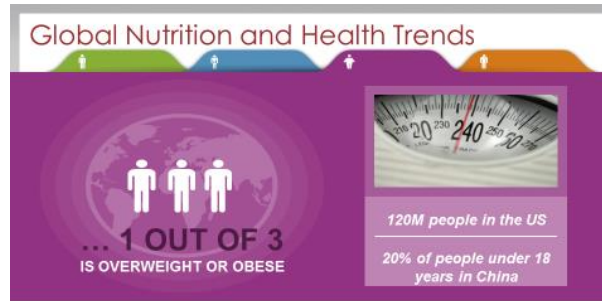
Source: UN, WEF, IBM, PWC, Litsearch, Bain analysis/ estimate



# Global Nutrition and Health Trends

World nutrition needs are too complex for any single actor to address them in their entirety

A combined effort of all stakeholders is a necessity to succeed



# Aging population



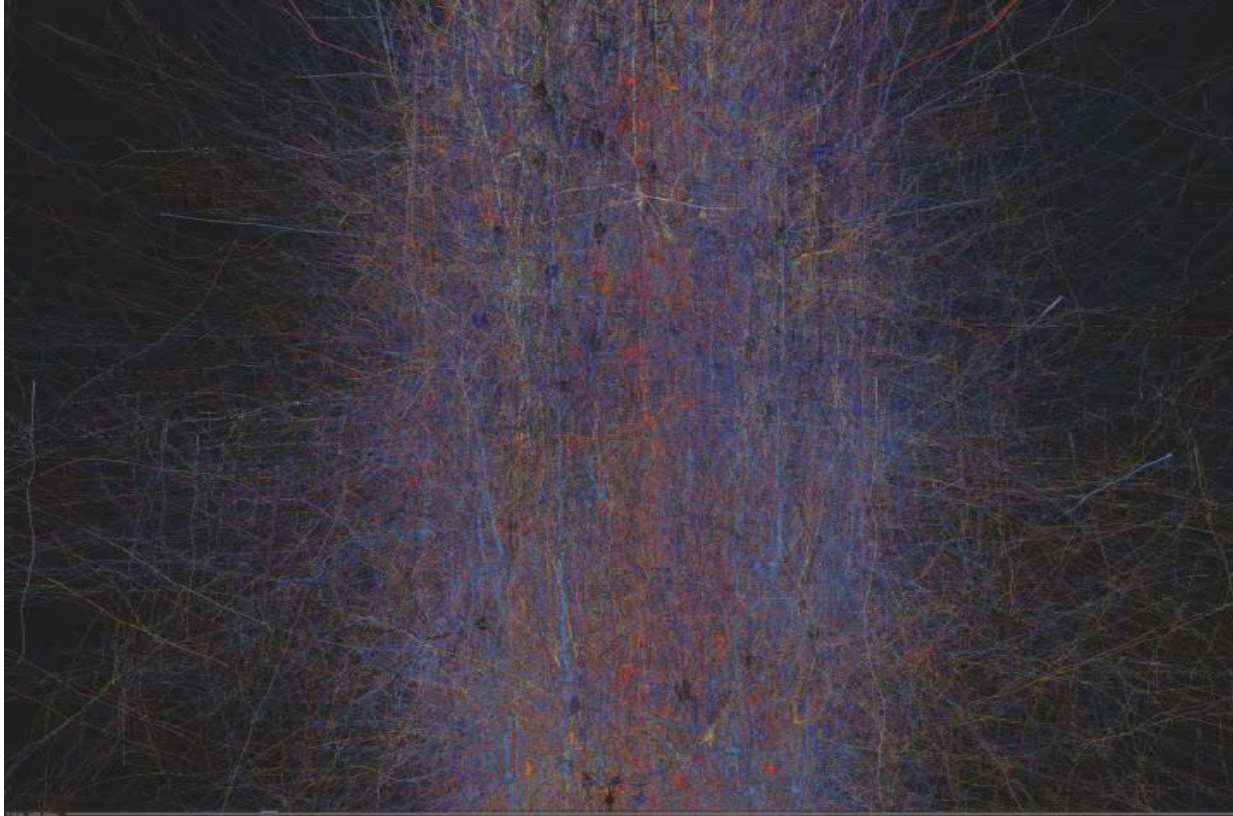
... **1 OUT OF 5**  
WILL BE OVER 65



*70% of developed countries with  
more 50+ than 50-*

*By 2050, there will be 2B people  
aged 60 and over (~22%) of the  
world's population*

# Aging population : Big data for neurology



ÉCOLE POLYTECHNIQUE  
FÉDÉRALE DE LAUSANNE



# Undernutrition



...MALNUTRITION IS THE  
CAUSE OF

**35%**

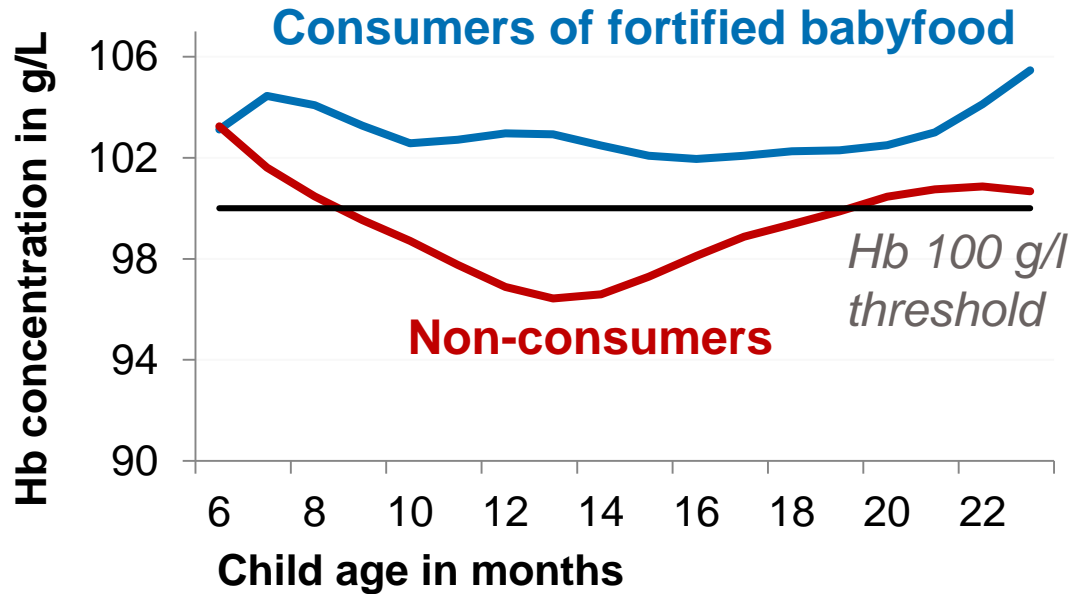
OF THE DISEASE BURDEN IN  
CHILDREN <5 YRS



*Maternal and child nutrition is the  
underlying cause of 3-5M deaths*

*Associated to increased  
susceptibility to chronic disease  
later in life*

# Average Iron and access to fortification



50% lower  
anaemia risk

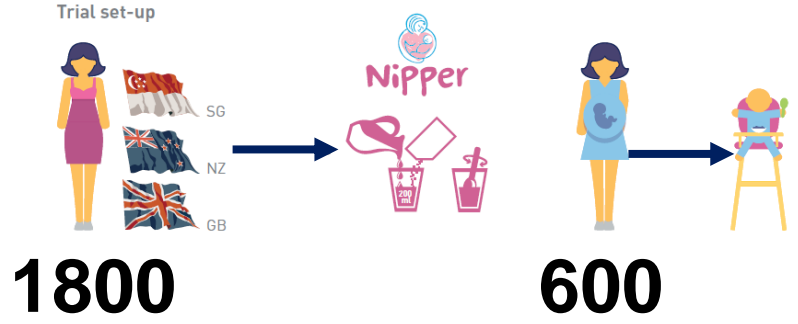
Improved  
cognition

5-17% gain  
productivity

Prieto A & Detzel P: Association between feeding types and haemoglobin concentrations in India. Poster presentation ISPOR, Italy 2015 – based on NFHS 2005-06

Eichler et al. BMC Public Health 2012, 12:506

# Maternal Nutrition and the first 1'000 days



**Auckland**  
New Zealand

# Epigenetics

# Overnutrition

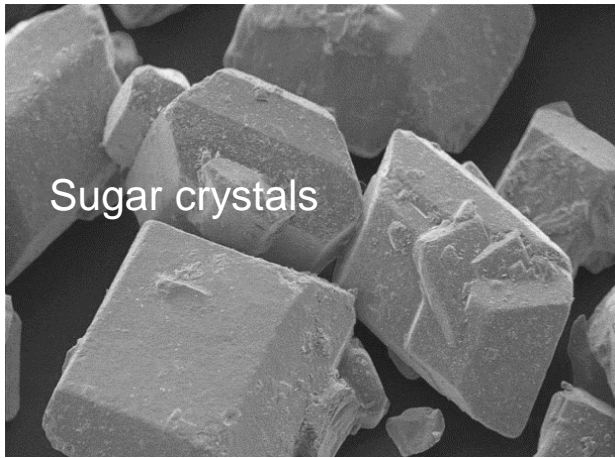


... **1 OUT OF 3**  
**IS OVERWEIGHT OR OBESE**



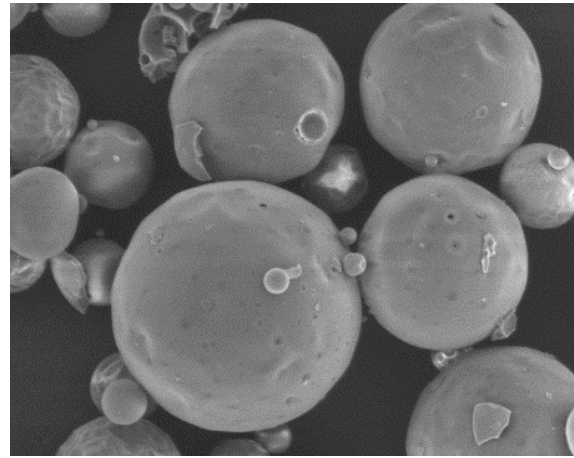
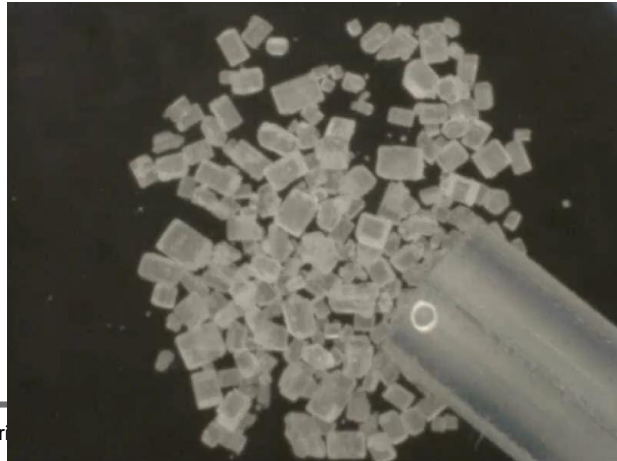
*120M people in the US*

*20% of people under 18  
years in China*



Sugar crystals

Slow dissolution



Fast dissolution





# Nutrition-associated disorders



... **1 IN EVERY 4**  
**SUFFERS FROM AN ALLERGY OR**  
**“NUTRITION-related DISORDER”**



*In developed countries. This includes skin, food, and respiratory*

*Forecast studies estimate that 50% of people will suffer from symptoms of various allergies in the next 20 years.*

# Refractory epilepsy

## brain energy control with nutrition



© Caters News Agency

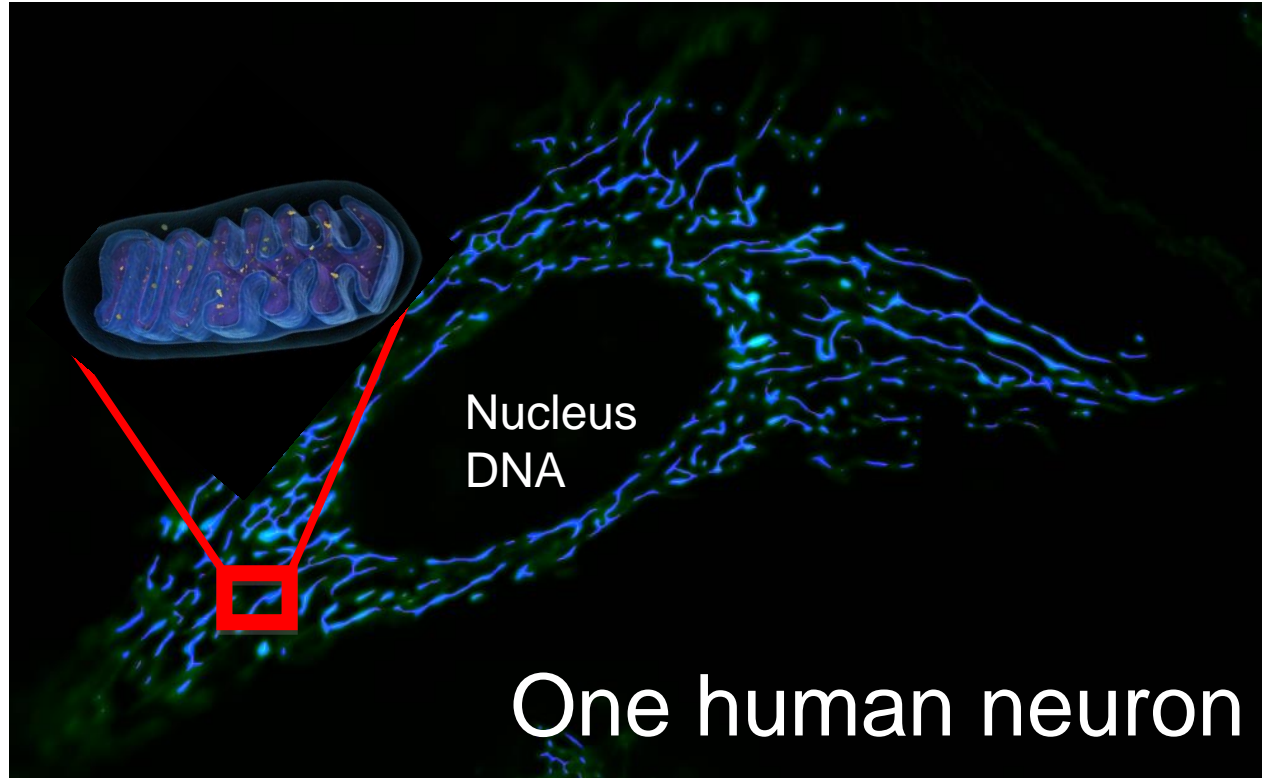


# Refractory epilepsy

## The mitochondria hypothesis



Lipids : MCTs  
Ketone bodies



One human neuron

# The future of food – personalised, science-based, resource-efficient, caring

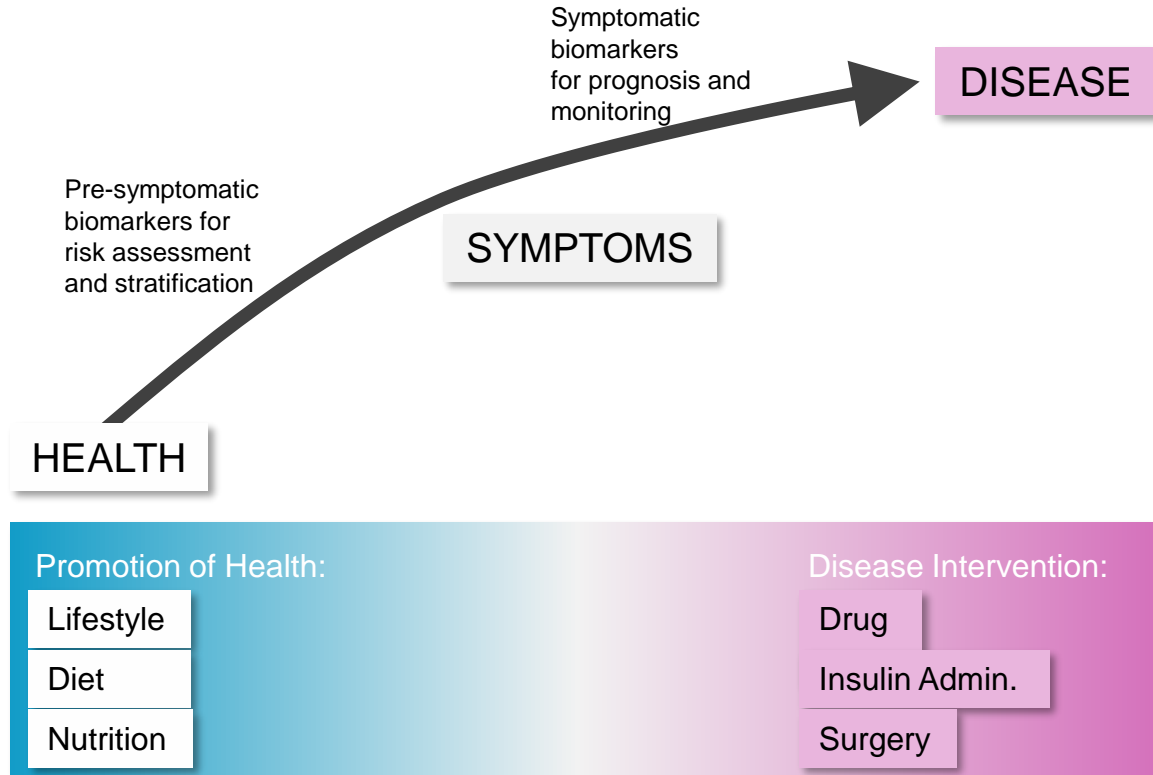
- 1. The challenge** We all desire a long and healthy life. This requires in the future basic dietary changes: a healthy diet for a growing world population can only be ensured if new scientific knowledge becomes part of the production of foods, if the lifestyle of people is oriented toward the goal of a healthy, long life and with a food system efficiently using natural resources.
- 2. The model** There will not be a uniform approach to healthy eating for everyone, but rather a personalized diet for different population groups. These differences may be either of a genetic or epigenetic nature, based, for example, on age or dependent on the specific life situation.
- 3. The responsibility of science** The Life Sciences will provide knowledge on a completely new basis with regard to the relationships of biological functions in the human body, nutrition and health.
- 4. The responsibility of the Food Industry** On the basis of the scientific knowledge of the life sciences, the food industry is developing products and services for a personalised diet for different populations. It provides these services to preserve resources and be socially beneficial for the greatest possible number of people.
- 5. The responsibility of politics** Social systems and health systems have to be changed from the treatment of existing diseases to the precautionary prevention of diseases. An open market must be provided to enable an efficient allocation of resources and comprehensive innovations.
- 6. The responsibility of each individual** People need to aspire to a new holistic quality in their personal lifestyle and diet, supported by educational institutions, the media, the producers and processors of food and the food trade.

# Understanding the Basis of Chronic Diseases: Multiple Factors and Individual Causes



# Continuous Progression of Chronic Diseases

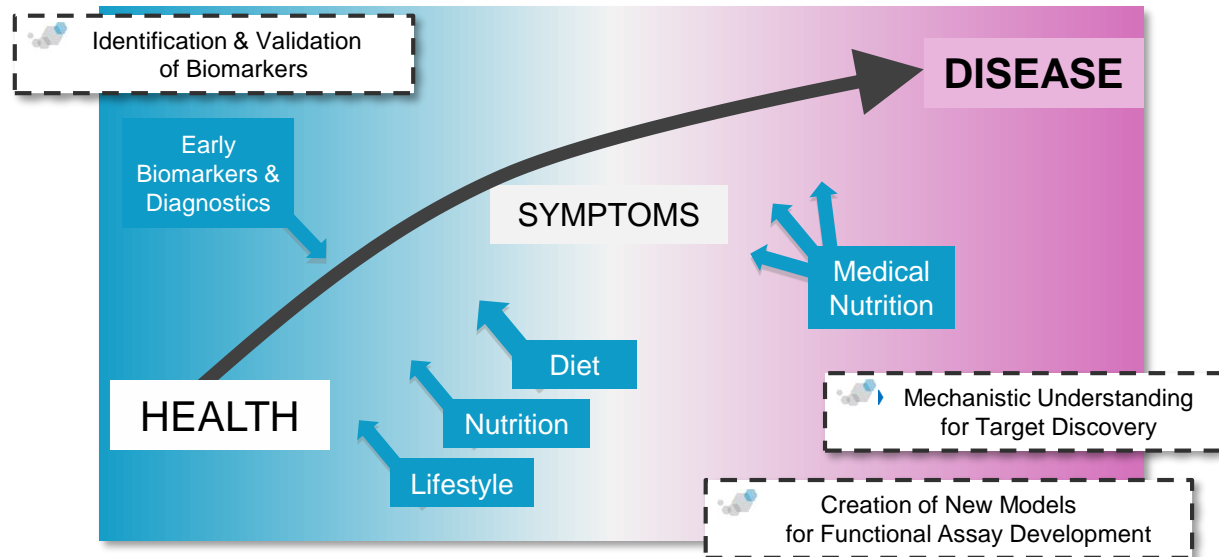
## NIHS Focus on Prevention



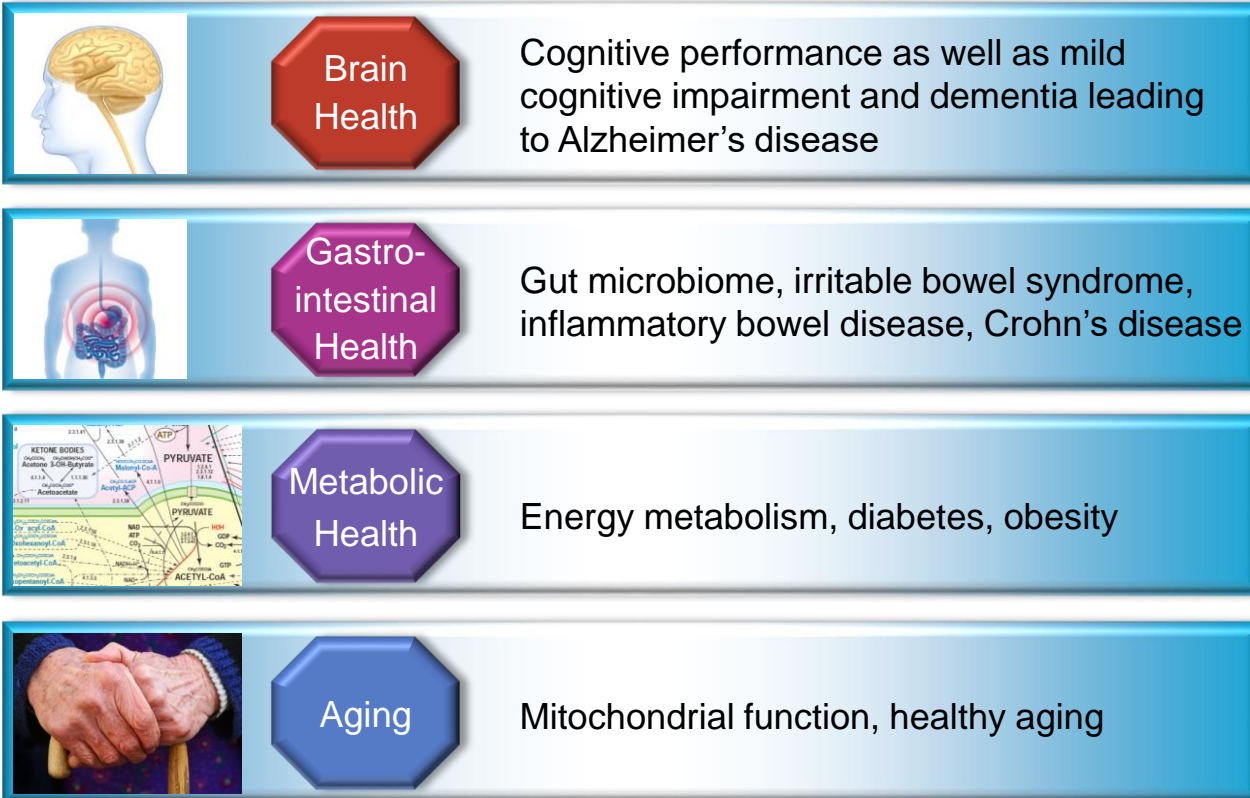
# Nestlé Institute of Health Sciences: Primary Mission & Objectives

**Understanding and modelling health through creation of systems biology interrelationships of diet, genes, lifestyle and the resulting cellular phenotype (proteome-lipidome-metabolome) to elucidate the continuum of health to disease.**

*Where we will act:*

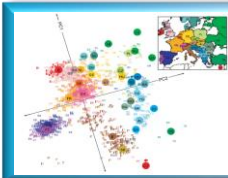


# NIHS Principal Research Areas



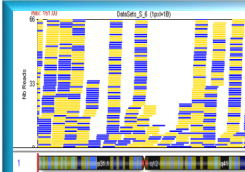


# NIHS Multidisciplinary Science Platforms



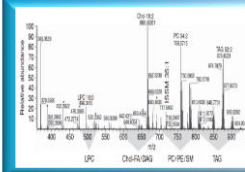
## Nutri-Genomics

To study the interaction of genes, diet and environment in the clinical setting



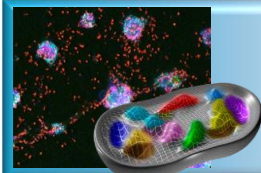
## Functional Genomics & Epigenetics

To analyze full genomes, study gene regulation and measure gene activity



## Metabolom- & Proteomics

To analyze the proteome, metabolome and lipidome in response to gene activity, diet, environment and life style



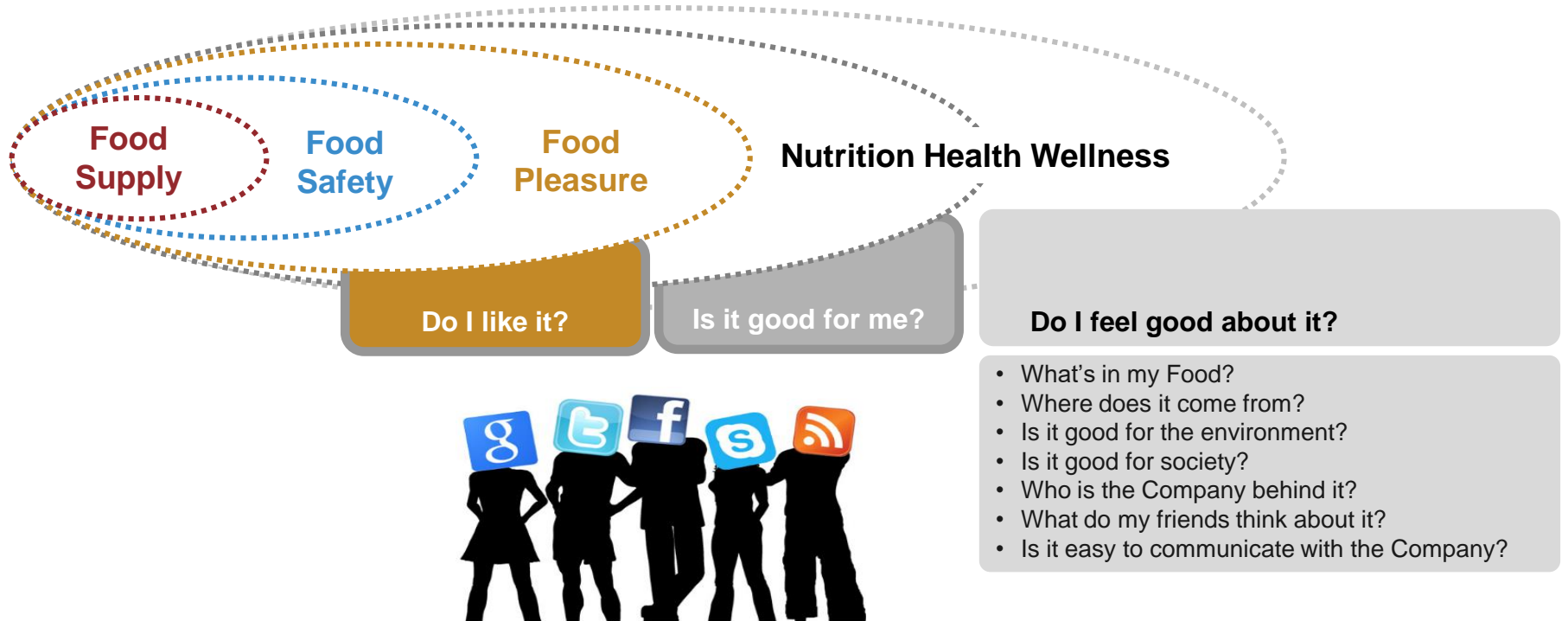
## Stem Cells & Mitochondrial Function

To develop person specific cellular models of health and disease  
To study mitochondrial metabolism, function and genetics in health and disease

Image Sources: Novembre *et al. Nature* 2008; Illumina; Schwudke *et al. C.S.H. Persp. Biol.* 2011; Viacyte; A. Dillin, Mitokyne

# Evolution of nutritional needs

## The generation “Y” has surprised the industry



# People are connected empowered to leverage personalized, private data



Man-machine interfaces  
and smartphones open  
new territories

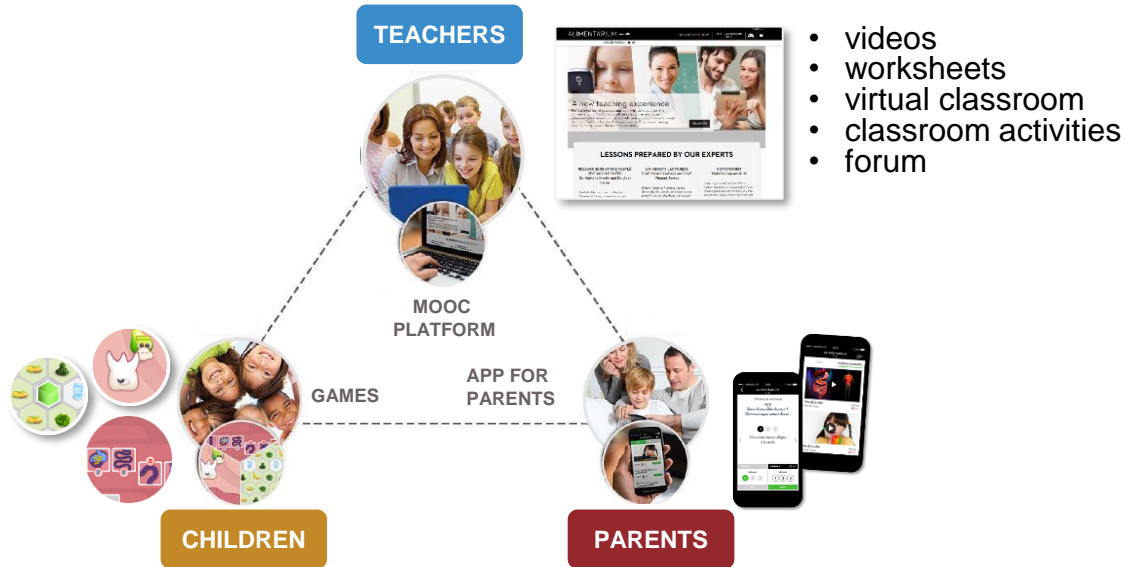


# Global Education for a better Nutrition

## first of its kind Massive Online Open Course (MOOC)



Museum and Online Academy



Covering 4 themes, in 3 languages (EN, D, FR)

- Food and the five senses
- Food and nutrients
- Transforming food
- The digestive system

**56 videos of experts**

RESEARCHERS AT THE NESTLÉ RESEARCH CENTER  
Dr. Nathalie Martin and Dr. Axel Syrbe

UNIVERSITY LECTURERS  
Prof. Kristin Verbeke and Prof. Vincent Barras

NUTRITIONIST  
Wafa Badran Amstutz



<http://www.alimentarium.ch/en/academy>

# Creating Shared Value

## data and... Trust

"For a company to be successful over the long term and create value for shareholders, it must create value for society."

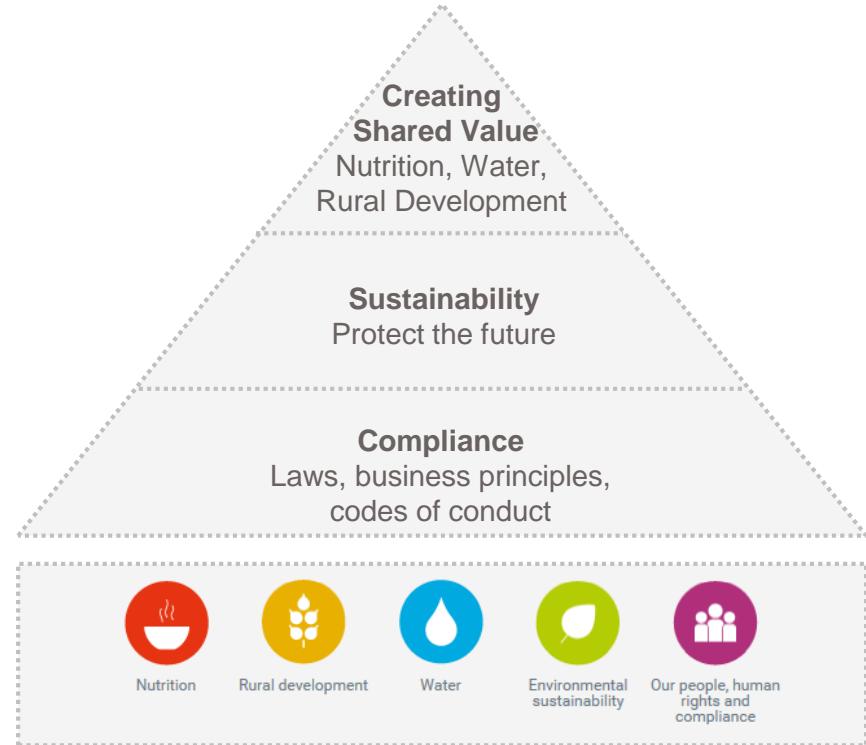
Peter Brabeck-Letmathe  
Chairman Emeritus



"Creating Shared Value:  
Redefining Capitalism and the  
Role of the Corporation in  
Society".

Michael E. Porter and Mark R. Kramer  
Harvard University, 2011

## Trust



# Nutrition for a better Life

Peter Brabeck-Letmathe

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## ERNÄHRUNG FÜR EIN BESSERES LEBEN

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Eine Reise von den  
Anfängen der industriellen  
Nahrungsproduktion  
zur Nutrigenomik

**campus**

Peter Brabeck-Letmathe

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## NUTRITION FOR A BETTER LIFE

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A Journey from the  
Origins of Industrial  
Food Production  
to Nutrigenomics

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## NUTRICIÓN PARA UNA VIDA MEJOR

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Un viaje desde  
los orígenes de la  
producción industrial  
de alimentos hasta la  
Nutrigenómica

**AECOC**   
Instituto Internacional  
San Telmo