

Reducing salt, fat and sugar in everyday foods

*Results from TeRiFiQ EU project
and opportunities for food industry*

Christian Salles
INRA, France



<http://www.terifiq.eu>

CIBUS
ITALIA
FEDERALIMENTARE
EXPO MILANO 2015

EXPO
MILANO 2015
NUTRIRE IL PIANETA
ENERGIA PER LA VITA

Corporate Participant

1

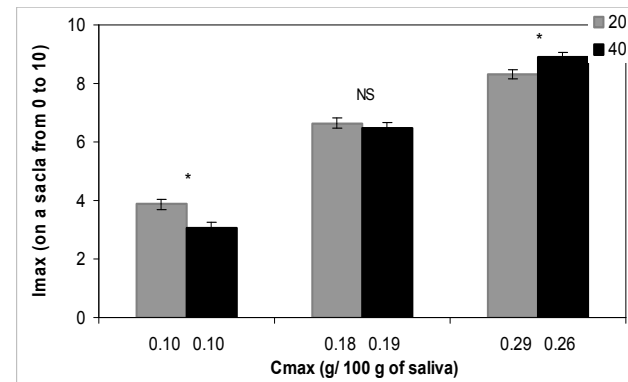
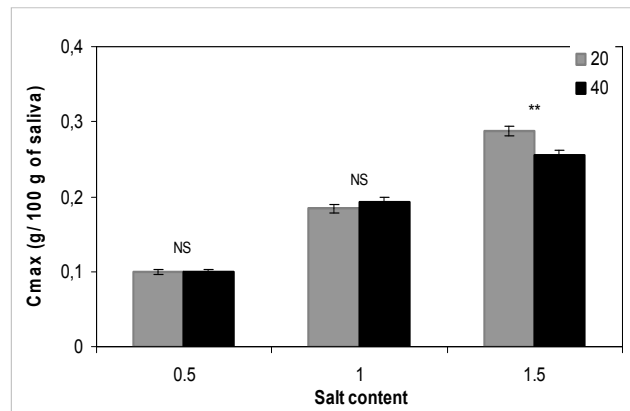




- National, European and World institutions alert that excess intake of salt, lipid, sugar lead to the onset of life-threatening pathologies. For example, sodium-rich diets have been widely demonstrated as promoting hypertension and saturated fats are positively associated with serum cholesterol level.
- Many countries and health organisations have encouraged the food industry to reduce the salt, fat, sugar content and (or) to improve fat quality in processed foods.
- However, these components are multifunctional. Consequently, changes in concentration or by substitution will change many properties of the food such as texture, flavour perception, acceptability, shelf life, safety and nutritional properties.



- **Many interactions** can occur between the flavour stimuli and the food matrix. As **example**, previous studies showed that saltiness perception was governed by the concentration of sodium present in saliva which varied not only according to salt content but also according to cheese composition, and more precisely lipid/dry matter ratio.



Lawrence et al. J Agric Food Chem (2012) 60, 5287-5298.

- **Binary reduction:** \searrow (Fat – Sodium – Sugar) \rightarrow \searrow fat/sodium & \searrow fat/sugar
- **Combining technologies** to achieve significant binary reductions in sodium, fat and sugar content in everyday foods whilst optimising their nutritional quality





- **Food categories**

- **Fat/sodium** in dairy (cheeses), meat (dry and cooked sausages) and sauces (for pizza) products

- **Fat/sugar** in bakery (Muffins, madeleines) and sweet cream products

- Physicochemical and perceptual interactions for these two systems while at the same time ensuring the products' nutritional and sensorial qualities, safety and affordability for both industry and consumers.

In particular, Terifiq explored promising strategies notably:

Modifying the composition of the food to increase stimuli release in-mouth (development of multiple emulsions),

- Perceptual interactions, mainly taste/aroma to enhance sweetness, saltiness and fat perception by congruent aroma notes.

- **SME participation**

Total EC subvention: 3 M€ EC contribution including >1 M€ for 11 SMEs partners (35%)





- TeRiFiQ aims to achieve significant binary reductions in sodium-fat and fat-sugar content of the most frequently consumed food products around Europe whilst at the same time ensuring the products' **nutritional and sensorial qualities, safety and affordability** for both industry and consumers.





- **17 partners including 11 SMEs** involved at all stages of project
- Structure of project
4 years: 3 years for reformulated food development / research at the lab scale and the last year for demonstration at the industrial scale





Nofima

Institute of Food Research, Norwich

Wageningen University

ACTIA (Actalia, ADIV, ITERG)

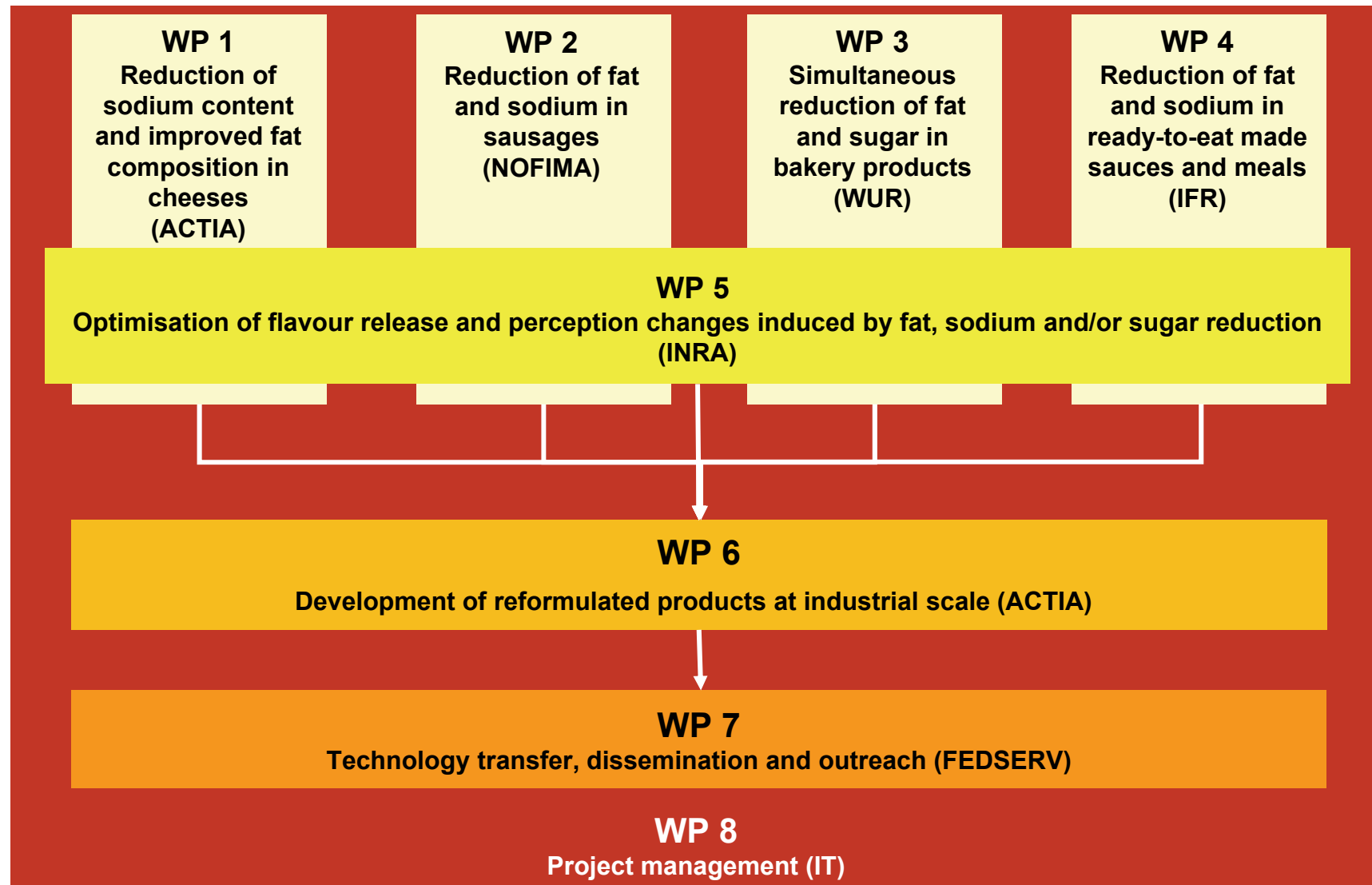
INRA Transfert

INRA (CSGA, STLO, QuaPA)



Participant	Country	Business Field	Activity in TeRiFiQ
 Brasserie d'Orval s.a.	BE	Beer and Cheese	RTD and DEMO on reformulated cheeses
  HERITAGE 1466 (HERVE)	BE	Cheese factory	RTD and DEMO on reformulated cheeses
 LEIV-VIDAR AS	NO	Meat products	RTD and DEMO on reformulated meat products (cooked sausages)
 BOADAS 1880 S.A.	ES	Meat products	Demonstration on reformulated meat products (dry sausages)
 Chazal groupe	FR	Delicatessen meat products	DEMO on reformulated meat products (paté)
 Millba AS	NO	Bakery production	RTD and DEMO on reformulated bakery products (muffin)
 ADRIA Développement	FR	Food technical institute	RTD and DEMO on reformulated bakery products (madeleine)
 Centiv GMBH	DE	Process technology and food research	RTD and DEMO on reformulated sauces
 S.C. Sativa - Product LTD	RO	Food production (bakery products and pizzas)	RTD and DEMO on reformulated sauces
 NIZO	NL	Food research contract	RTD (not on their own food product)
 Federalimentare Servizi srl	IT	Services to companies of the food sector	Leader of technology transfer, dissemination and outreach





1 Reducing sodium content and improved fat composition in cheese

- T1.1 - The relations between salt-level reductions and fermentations in cheese
- T1.2 - Relation of salt-level reduction and the ripening process (lipolysis, proteolysis, lactates fermentations, opening etc.),
- T1.3 - influence of salt-level reduction on cheese final acceptability (texture, functionalities, taste, aroma).
- T1.4 - Correction of salt reduction by modulation of composition parameters
- T1.5 - Study of the increase of unsaturated fatty acids

2 Reduction of fat and sodium in cooked and dry-fermented sausages

- T2.1 - Exploring the application of new technologies in sausage production
- T2.2 - Optimisation of functional properties of salt and protein
- T2.3 - Impact of fat and sodium reductions on water and salt transfers and formation of odour and flavour compounds
- T2.4 - Process optimisation in pilot-scale
- T2.5 - Evaluation of product quality and consumer acceptance

3 Bakery products with reduced fat and sugar content

- T3.1 - Development of model bakery product with reduced fat and sugar content
- T3.2 - Optimization of the formulation of model bakery product
- T3.3 - Up-scaling of model products and evaluation of their nutritional quality, sensory performance and consumer acceptance

4 Reduction of fat and sodium in readymade sauces and meals

- T4.1 - Development of model foods with reduced fat and sodium.
- T4.2 - Pilot scale production of ready meals with reduced fat and sodium
- T4.3 - Sensory assessment of pilot scale formulations
- T4.4 - Evaluating product quality

5 Optimising flavour release and perception changes induced by fat, sodium and/or sugar reduction

- T5.1 - Perceptual interactions
- T5.2 - *In vivo* flavour release and perception
- T5.3 - *In vitro* flavour release
- T5.4 - Small size solute diffusion in reformulated products

6 Development of reformulated products at industrial scale

- T6.1 - Industrial scale production of cheeses with reduced fat and sodium
- T6.2 - Industrial scale production of sausages with reduced fat and sodium
- T6.3 - Industrial scale production of bakery products with reduced fat and sugar
- T6.4 - Industrial scale production of ready-made sauces with reduced fat and sodium
- T6.5 - Consumer behaviour

7 Technology transfer, dissemination and outreach

- T7.1 - Dissemination to the scientific community
- T7.2 - Technology transfer to the industry
- T7.3 - Communication to stakeholders (general public and policy markers/consumer groups)

8 Project Management

- T8.1 - Strategic steering
- T8.2 - Project monitoring
- T8.3 - Administrative and Financial Management



Scientific session: the most interesting scientific results in the objective of a food reformulation of quality →

Industrial session: the most successful food reformulations in a food marketing objective →

<p style="text-align: center;">Less sodium, fat and sugar in everyday foods -the science behind</p> <p style="text-align: center;">Session Chair: Christian Salles</p>	
10:30-10:35	Welcome address - Maurizio Notarfonso, FEDERALIMENTARE
10:35-10:50	Introduction to TeRiFiQ - Christian Salles, INRA
10:50-11:10	Introduction to the topic and outlook - Tim Gumbel, EC DG SANTE
11:10-11:30	Invited speaker from PLEASURE EU project - Alain Le Bail, ONIRIS
11:30-11:50	Less sodium content and better fat in cheeses - Jean-René Kerjean, ACTALIA
11:50-12:10	Less fat and sodium in sausages - Rune Rødbotten, NOFIMA
12:10-12:30	~~Coffee break~~
12:30-12:50	Less fat and sugar in muffins and madeleines - Markus Stieger, WUR
12:50-13:10	Less fat, salt and sugar in sauces - Peter Wilde, IFR
13:10-13:30	Flavour release and perception in reformulated foods - towards a better understanding - Christian Salles
13:30-14:30	~~Buffet lunch~~
<p style="text-align: center;">Less sodium, fat and sugar in everyday foods -opportunities for SMEs and industry</p> <p style="text-align: center;">Session Chair: Christophe Cotillon</p>	
14:30-14:50	Intro to demonstration activities - Christophe Cotillon, ACTIA
14:50-15:40	Success stories by TeRiFiQ SMEs - Moderator: Christophe Cotillon
15:40-16:00	Health claim dossier: opportunities for SMEs and lessons learnt - Alfonso Siani, EFSA
16:00-16:30	~~Coffee break~~
16:30-17:15	Roundtable with industry and public stakeholders: Tim Gumbel (EC DG SANTE), Dirk Jacobs (FoodDrinkEurope), Agostino Macri (UNC), Alfonso Siani (EFSA) [to be confirmed], Dario Vallauri (Tecnogrande, SALUX Coordinator), Moderator: Igor Bodnár, Firmenich
17:15-17:30	Conclusions - Christian Salles





The **main goal** of this “TeRiFiQ open Symposium” is to present the main project outcomes to the main Food and Drink stakeholders.

- Scientific original results in relation with reformulation
- Industrial application

Participants

Scientifics

Industry (SME and LE)

Food clusters

Associations (consummers, health)

...

As the symposium is open, all the people interested by the toppic





The research leading to these results has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement n° 289397 ("TeRiFiQ"). The contents of this presentation reflect only the author's/authors' views and the European Union is not liable for any use that may be made of the information contained therein.

I wish you a nice TeRiFiQ final meeting

