RÉPUBLIQUE FRANÇAISE
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Safe food for a better world: the French experience

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PROFESSIONAL EXPERIENCE

1998-2000; 2005-2006
Faculty of Chemistry, Iasi, Romania

2000-2004:
University of Antwerp, BE (PhD)

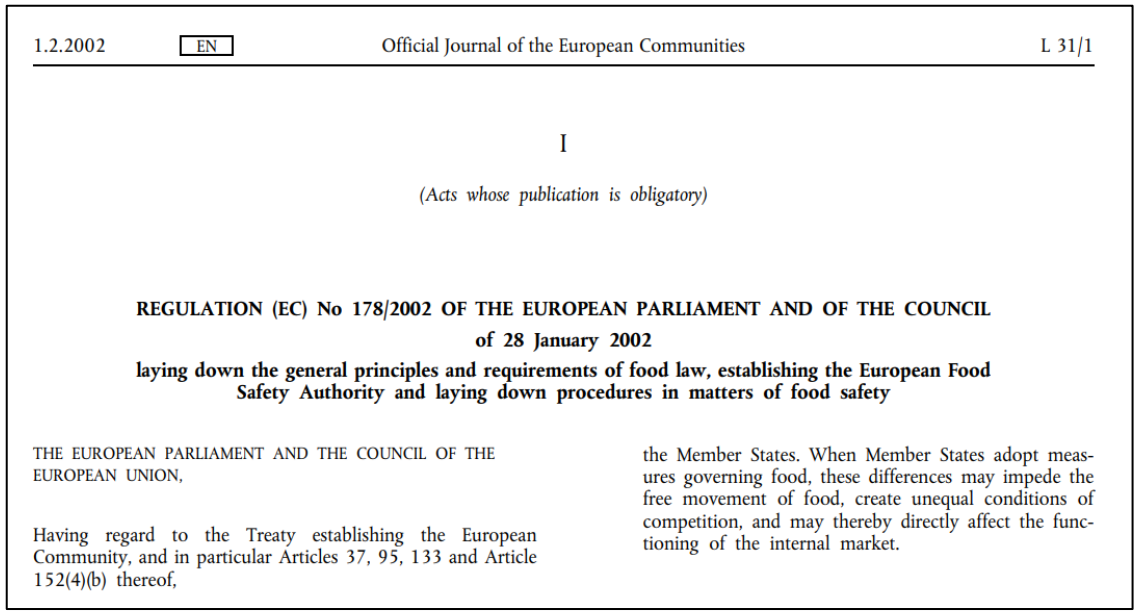
2006-2008: University of Venice, Italy (post-doc 1)

2008-2010:
LNE, Paris (post-doc 2)

2010-2015: UniLasalle, Beauvais
(associated professor)

2016-present:
Anses, Maisons-Alfort (head of unit)

Food Law in the European Union



1.2.2002 EN Official Journal of the European Communities L 31/1

I

(Acts whose publication is obligatory)

REGULATION (EC) No 178/2002 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL
of 28 January 2002
laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular Articles 37, 95, 133 and Article 152(4)(b) thereof,

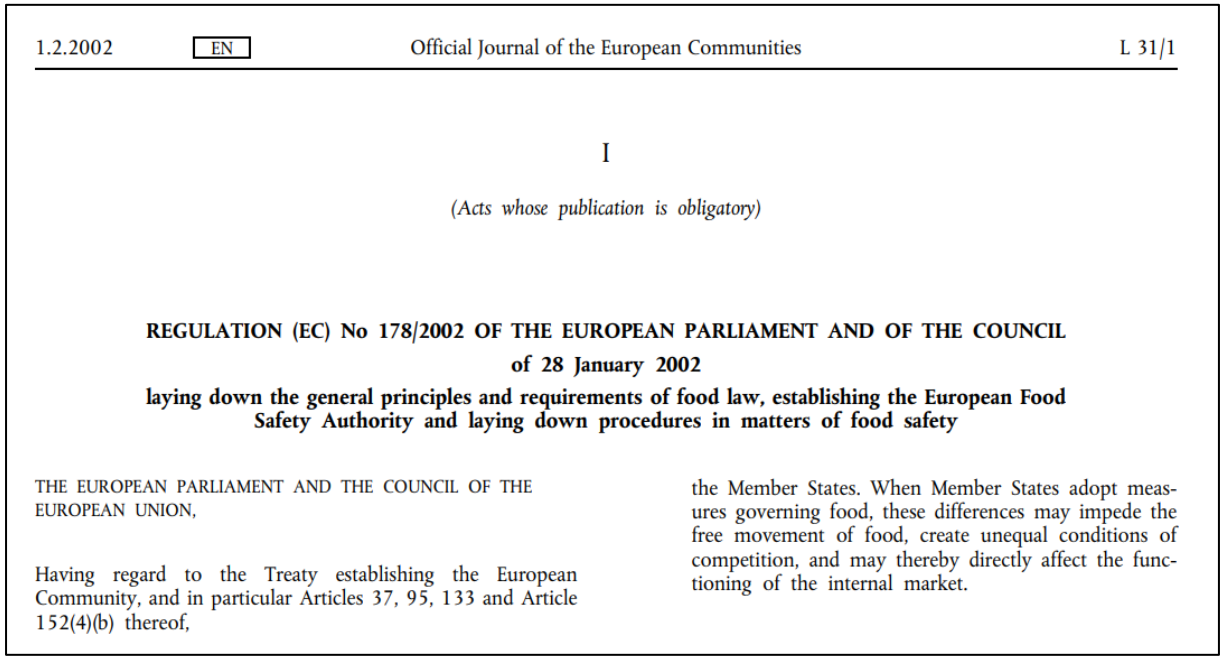
the Member States. When Member States adopt measures governing food, these differences may impede the free movement of food, create unequal conditions of competition, and may thereby directly affect the functioning of the internal market.

Networking of laboratories of excellence, at regional and/or interregional level, with the aim of ensuring continuous monitoring of food safety, could play an important role in the prevention of potential health risks for citizens.

Article 6

Risk analysis

1. In order to achieve the general objective of a high level of protection of human health and life, food law shall be based on risk analysis except where this is not appropriate to the circumstances or the nature of the measure.



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Networking of laboratories of excellence, at regional and/or interregional level, with the aim of ensuring continuous monitoring of food safety, could play an important role in the prevention of potential health risks for citizens.

A large number of monitoring & control plans are set up in EU to assess the food safety, especially in a raw form (these plans are rarely applied to food as consumed).

Accredited laboratories, a key for ensuring accurate monitoring of the food safety

WORLDWIDE: ≅ 40 000 laboratories accredited ISO 17025

FRANCE: ≅ 2000 laboratories accredited ISO 17025 (5% of the worldwide number), from which ≅ 500 in the field «Biology-Agrifood » (≅ 25% of the French accredited labs)

≅ *65 accredited (routine) laboratories dealing with official microbiological analyses*

≅ *15 accredited (routine) laboratories dealing with official chemical contaminants analyses*

≅ *15 accredited (routine) laboratories dealing with official veterinary drugs analyses*

https://www.cofrac.fr/qui-sommes-nous/notre-organisation/la-section-laboratoires

All routine laboratories carrying out "official analyses " are coordinated by National Reference Laboratories ! (not discussed here)

Monitoring & control plans (MCPs) in France in 2021

21 MCs were implemented according to a program based on a regulatory and risk analysis at the national level.

Number of samples for the MCs analysed in 2021

	Nombre de prélèvements réalisés
Prélèvements sur le territoire national	56751
Produits prélevés à l'importation, en PCF	952
Total général	**57703**

Type de contamination	Nombre de prélèvements avec objectif de SURVEILLANCE (PS) ou d'exploration (PE) (nombre de plan)	Nombre de prélèvements avec objectif de CONTRÔLE (nombre de plan)	Total général
Résistance antimicrobienne	1 441 (2 PS)		1 441
Biologique	240 (2 PE) + 2 893 (8 PS)		3123
Chimique	26 (1PE) + 4 460 (5 PS)	47 388 (4 PC)	51 874
Physique	313 (1 PS)		313
Total	**9363**	**47 388**	**56751**

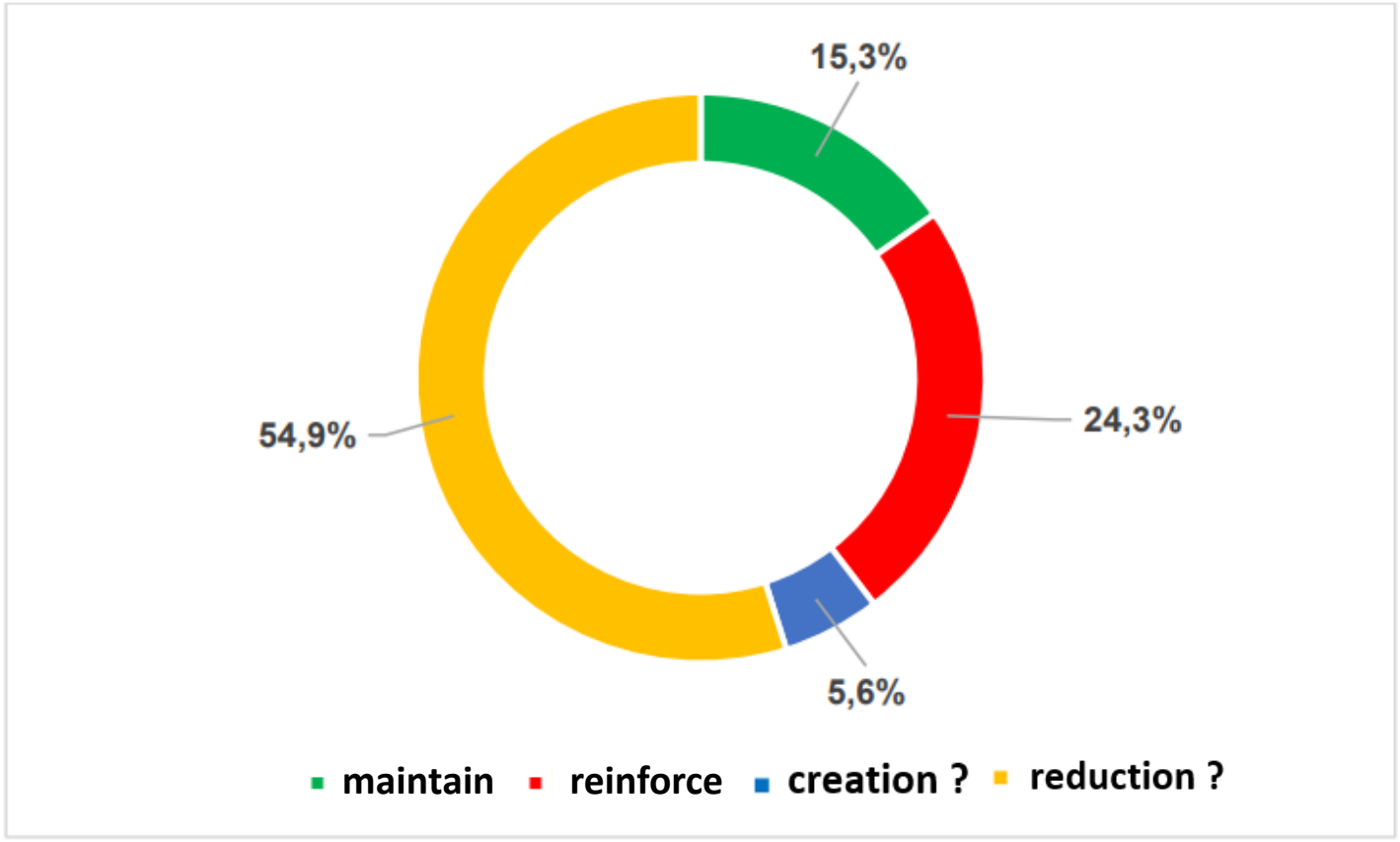
Most of analyses (91%) concerned chemical contaminants !

Of all the 21 plans deployed in 2021, less than 0.7% of samples were found to be non-compliant.

Are the “traditional” monitoring/control plans really efficient ?

Too large number of analyses carried out each year ⇒ considerable budget !

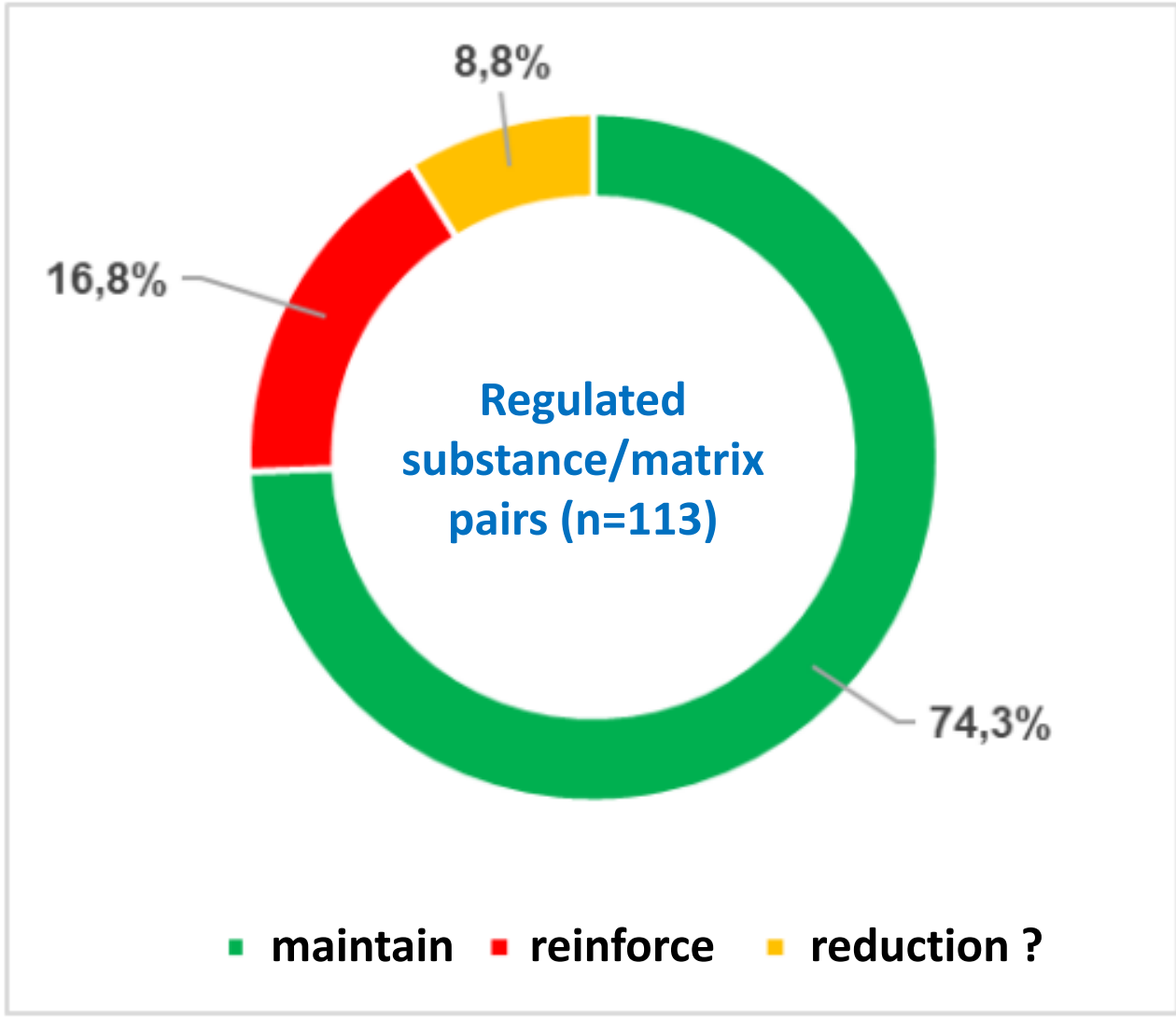
- ANSES released (2019) a report (CIMAP 2) regarding the optimization of the monitoring/control plans related to food chemical contamination
- examination of 576 substance/matrix pairs

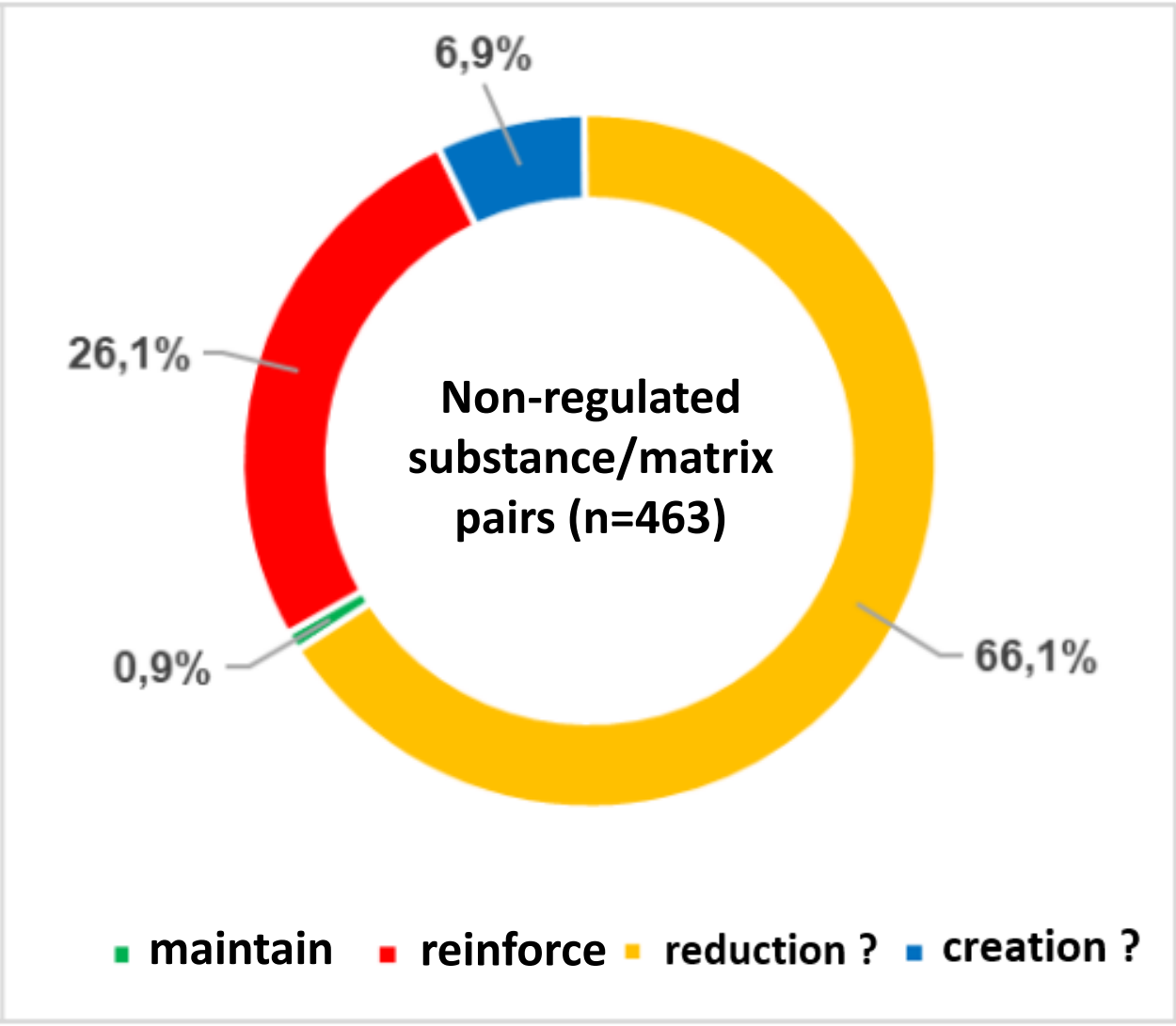


https://www.anses.fr/fr/system/files/ERCA2015SA0187Ra.pdf

Global recommendations for the 576 substance/matrix pairs examined in the framework of the CIMAP 2 study

Recommendations for regulated and not regulated substance/matrix pairs in the framework of the CIMAP 2 study





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What is the difference between hazard and risk ?

HAZARD

=

potential source of harm

The presence of a shark in the sea is a hazard.

RISK

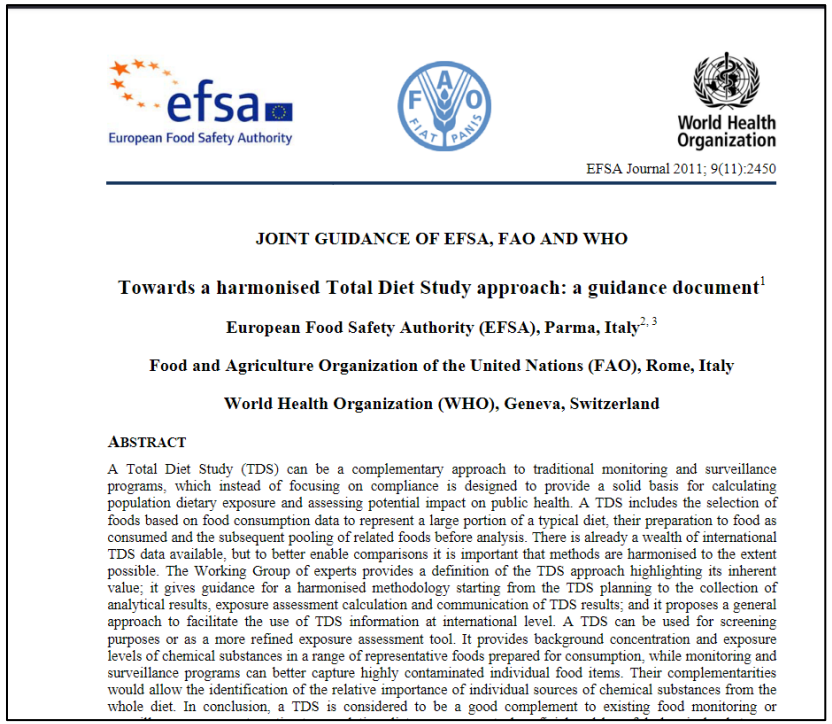
=

likelihood that a hazard will occur that results in harm

Swimming in the proximity of a shark in the sea is a risk.

TOTAL DIET STUDIES:
THE ULTIMATE TOOL TO ASSESS THE FOOD SAFETY

- The purpose of TDS is to measure the quantity of chemical substances ingested by the general population and by various specific population groups (by region, age, etc.).
- TDS are complementary to traditional monitoring/surveillance plans
- TDS reflect the chronic dietary exposure or intake



efsa
European Food Safety Authority

World Health Organization

EFSA Journal 2011; 9(11):2450

JOINT GUIDANCE OF EFSA, FAO AND WHO

Towards a harmonised Total Diet Study approach: a guidance document[1]

European Food Safety Authority (EFSA), Parma, Italy[2, 3]

Food and Agriculture Organization of the United Nations (FAO), Rome, Italy

World Health Organization (WHO), Geneva, Switzerland

ABSTRACT

A Total Diet Study (TDS) can be a complementary approach to traditional monitoring and surveillance programs, which instead of focusing on compliance is designed to provide a solid basis for calculating population dietary exposure and assessing potential impact on public health. A TDS includes the selection of foods based on food consumption data to represent a large portion of a typical diet, their preparation to food as consumed and the subsequent pooling of related foods before analysis. There is already a wealth of international TDS data available, but to better enable comparisons it is important that methods are harmonised to the extent possible. The Working Group of experts provides a definition of the TDS approach highlighting its inherent value; it gives guidance for a harmonised methodology starting from the TDS planning to the collection of analytical results, exposure assessment calculation and communication of TDS results; and it proposes a general approach to facilitate the use of TDS information at international level. A TDS can be used for screening purposes or as a more refined exposure assessment tool. It provides background concentration and exposure levels of chemical substances in a range of representative foods prepared for consumption, while monitoring and surveillance programs can better capture highly contaminated individual food items. Their complementarities would allow the identification of the relative importance of individual sources of chemical substances from the whole diet. In conclusion, a TDS is considered to be a good complement to existing food monitoring or

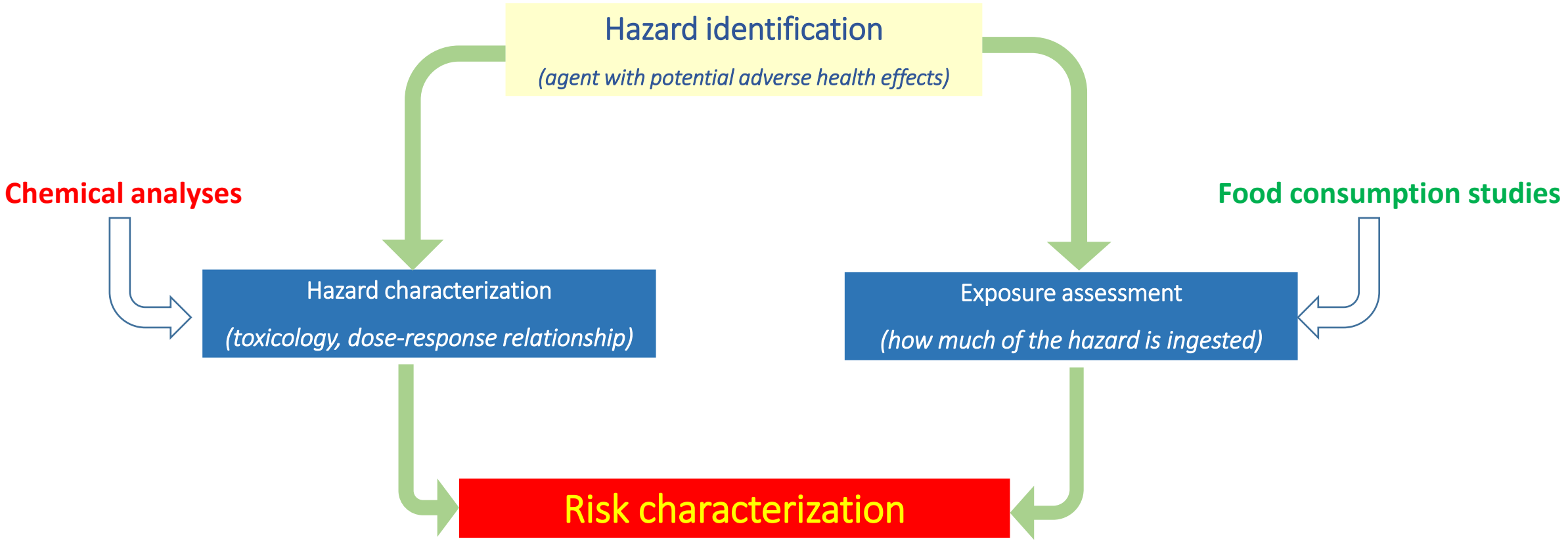
https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2011.2450

TOTAL DIET STUDY METHODOLOGY

TDS rely on:

- A large & representative proportion of the diet of the global (or specific) population (> 90%)
- Foods are prepared “as consumed”
- Samples are pooled before analysis (to reflect the global population)

Exposure Assessment: How much of a chemical is an organism exposed to?



$$E_i = \sum_{k=1}^{n} \frac{C_{i,k} \times L_k}{W_i}$$

E_i = daily exposure of an individual (µg / kg body weight / day)

$C_{i,k}$ = daily consumption of food (g/day)

L_k = level of the food chemical (µg/g)

W_i = body weight of the individual (kg)

Risk assessment: exposure assessment to a contaminant X

	Consumption (*g/day*)	Consumption (*g/kg bw/day*)	Concentration (*µg X/g*)	Exposure (*µg/kg bw/day*)
	1200	20	0,015	0,300
	300	5	ND < 0,003	< 0,015
	150	2,5	ND < 0,003	< 0,008
	50	0,8	ND < 0,003	< 0,003
	40	0,7	0,020	0,013
	60	1	0,500	0,500
	35	0,6	ND < 0,003	< 0,002

>90% Total diet

bw = 60 kg

The exposure level is compared with the toxicological reference values for the investigated chemical to assess the chronic risk !

Total diet studies (TDS) carried out in France

2001-2005

- 1st French TDS: adults and children over 3 years (INCA1, 1999)
- ≅ 2,300 food products bought
- 30 chemicals measured
- > 40,000 analytical results
- ≅ 1 million €

2006-2011

- 2nd French TDS: adults and children over 3 years (INCA2, 2009)
- ≅ 20,000 food products analyzed
- 445 chemicals measured
- > 250,000 analytical results
- ≅ 3.7 million €

2010-2016

- Infant French TDS: children < 3 years (Nutri-Bébé, 2005)
- ≅ 5,500 products bought
- 670 chemicals measured
- > 200,000 analytical results
- ≅ 3.1 million €

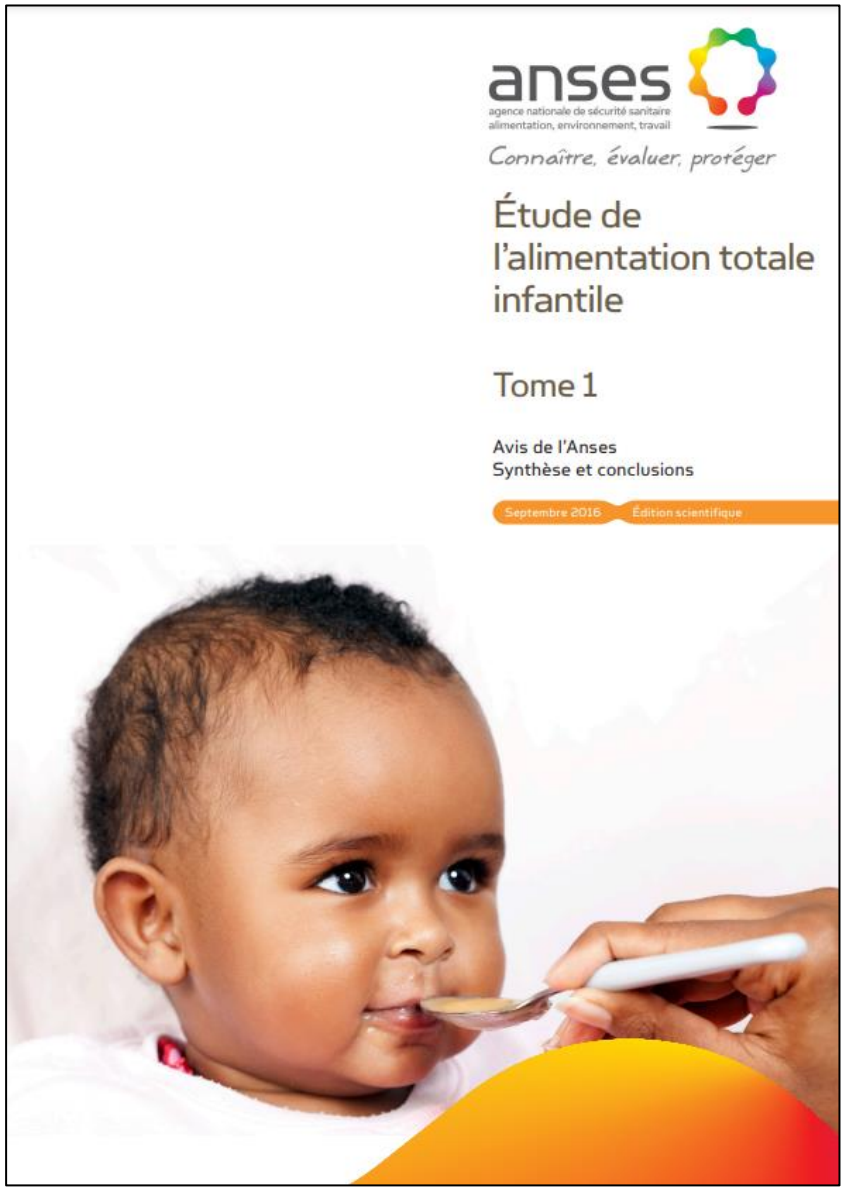
2019-2024

- 3rd French TDS: adults and children over 3 years (INCA3, 2017)
- ≅ 8,600 food products bought
- ≅ 250 chemicals measured
- ≅ 4.5 million €

National individual study of food consumption (INCA 3)

https://www.anses.fr/fr/system/files/NUT2014SA0234Ra.pdf

Infant Total Diet Study (2010-2016)



https://www.anses.fr/fr/system/files/ERCA2010SA0317Ra.pdf

Main conclusions regarding the exposure of the French infants to chemical contaminants

	Situation jugée préoccupante	Risque ne pouvant être exclu	Risque jugé tolérable ou admissible	Impossibilité de conclure quant au risque
Eléments traces métalliques et minéraux	plomb**, arsenic inorganique**, nickel	aluminium, méthylmercure**, strontium, chrome VI, selenium (> 1 an), cobalt, baryum, cadmium**, cuivre (> 1 an)	chrome III, mercure inorganique, antimoine	Germanium, cuivre (< 1 an), sélénium (< 1 an), argent, arsenic organique, étain**, gallium, tellure, vanadium
Polluants organiques persistants	Dioxines et furanes**, polychlorobiphényles**		Polybromodiphényl éthers (7 congénères), PBDE-209, polybromobiphényls, hexabromocyclododécane, Acide perfluorooctanesulfonique, Acide perfluorooctanoïque, tétrabromobisphénol A	Acides perfluoroalkylés (autres que PFOS et PFOA)
Composés néoformés	Acrylamide, furane		Hydrocarbure aromatiques polycycliques**	
Mycotoxines	Toxines T2/HT2**, déoxynivalénol** et ses dérivés	Ochratoxine A**, aflatoxines**	Nivalénol, patuline**, fumonisines**, zéaralénone**	Toxines d'*Alternaria*
Substances issues de la migration de matériaux au contact des denrées alimentaires		Bisphénol A	Benzophénone, 4-méthylbenzophénone (4-MBP), nonylphénols, BADGE et produits d'hydrolyse, DEHP, DnBP, DiDP & DiNP, BBP	*4-tert*-octylphénol, 4-hydroxybenzophénone (4-HBP), 4-benzoylbiphényle (PBZ), 2-isopropylthioxanthone (ITX), Dérivés chlorhydrines du BADGE, DiBP, DEP, DCHP, DnOP
Phytoestrogènes et stéroïdes sexuels d'origine animale		Génistéine (chez les consommateurs de produits à base de soja)	Génistéine (chez les non consommateurs de produits à base de soja)	17β-testostérone & 5α-dihydro-testostérone, 17α et 17β-estradiol et estrone, progestérone, et autres stéroïdes

2nd French Total Diet Study (TDS2)

https://www.anses.fr/fr/system/files/PASER2006sa0361Ra1.pdf

Main conclusions regarding the exposure of the French population exposure to inorganic contaminants (trace metals)

Substances	Résultats principaux	Actions correctives et/ou besoins de recherche
Antimoine, Baryum, Nickel	Risque pouvant être écarté pour la population générale	-
Cobalt	Risque pouvant être écarté pour la population générale	Nécessité de mener des études sur la cancérogénicité et la génotoxicité (car incertitude)
Mercure inorganique	Impossible de conclure quant au risque lié à l'exposition alimentaire	Nécessité de poursuivre les efforts pour réduire les expositions alimentaires Nécessité d'abaisser les limites analytiques pour le mercure et le plomb Nécessité de mettre en œuvre des méthodes analytiques de routine pour la spéciation dans les aliments pour l'arsenic et le mercure Nécessité d'identifier l'origine de l'augmentation des contaminations pour le cadmium
Cadmium, Aluminium, Méthylmercure, Arsenic inorganique, Plomb	Risque ne pouvant être écarté pour certains groupes de consommateurs (Cadmium : adultes, Aluminium, Plomb et Arsenic inorganique : adultes et enfants les plus exposés, Méthylmercure : forts consommateurs de thon)	
Etain, Gallium, Germanium, Strontium, Argent, Tellure, Vanadium	Impossible de conclure quant au risque lié à l'exposition alimentaire	Nécessité de mener des études toxicologiques à long terme, par voie orale Nécessité de mettre en œuvre des méthodes analytiques de routine pour la spéciation dans les aliments pour l'étain

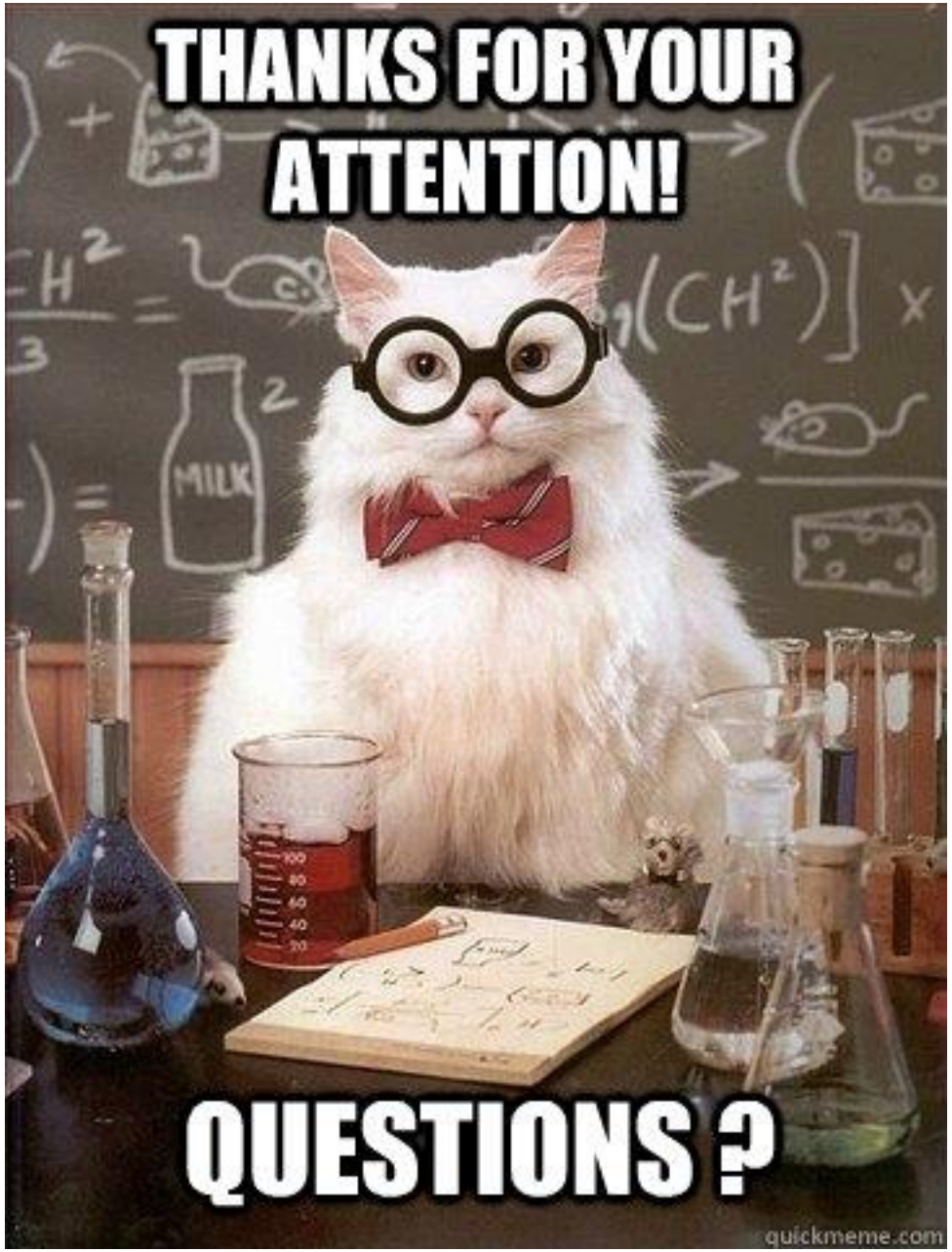
CONCLUSIONS

What we learnt from our monitoring/control plans ?

- The MCPs confirm the high level of risk management in France concerning the potential presence of chemical contaminants in foodstuffs (very low rate of non-compliant results).
- Reinforce the monitoring of non-compliant products.

What we learnt from our TDSs ?

- The TDSs showed that in certain population groups there is a risk of toxicological thresholds being exceeded for some substances, such as lead, cadmium, inorganic arsenic and acrylamide, requiring efforts to reduce exposure.
- Since the risks are often associated with high levels of consumption of a particular foodstuff or group of foodstuffs, ANSES highlights the importance of a diversified, balanced diet in which the types of food and their quantities are varied.
- The TDSs have shown that there is a need to develop scientific knowledge concerning both toxicology and analytical techniques for a number of regulated or non-regulated substances, for which the risk assessment is currently not conclusive.



(http://www.quickmeme.com/meme/3sa3hg)

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