



# ***ISO/CEN's perspective with challenges in compositional and contaminants testing***

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## Summary

- ISO committees of interest
- CEN committees of interest
- Some examples



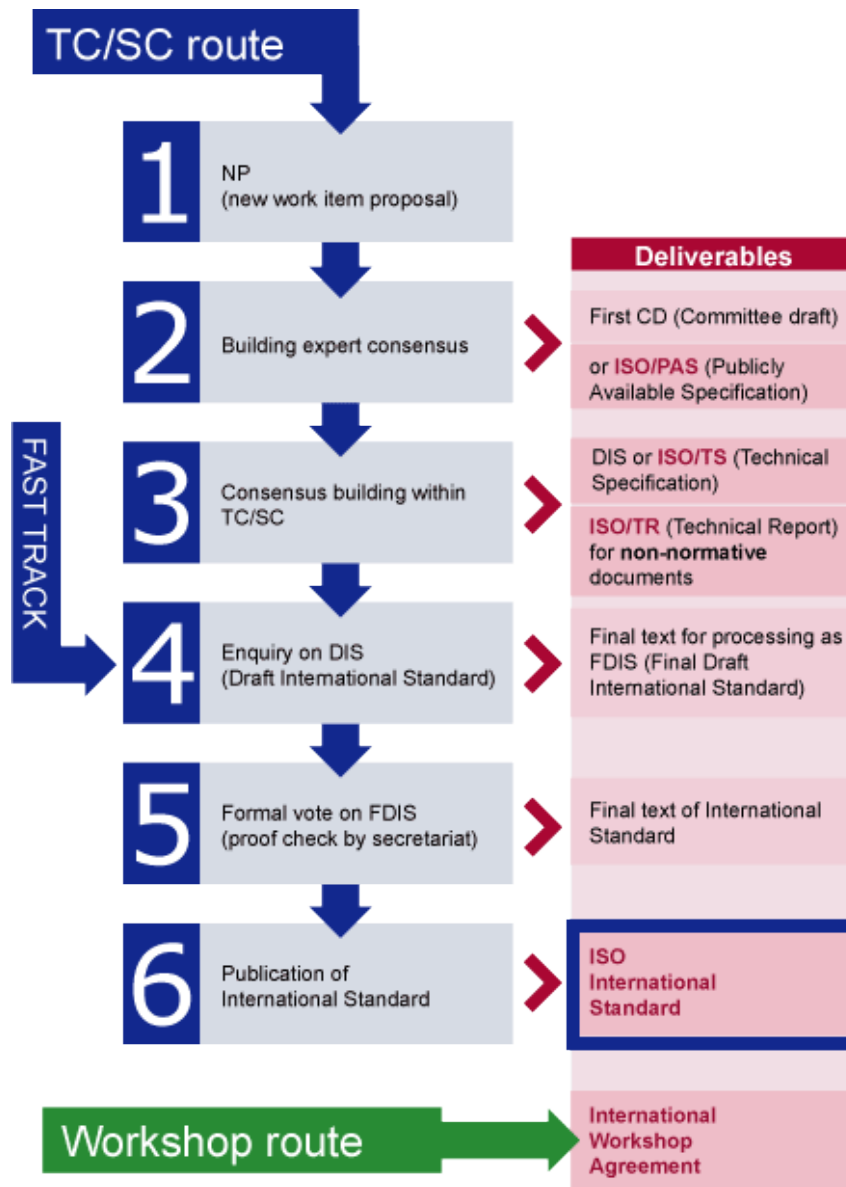
## ISO/TC 34 – Food products

- SC 2 - Oleaginous seeds and fruits and oilseed meals
- SC 3 - Fruits and vegetables and their derived products
- SC 4 - Cereals and pulses
- **SC 5 – Milk and milk products**
- SC 6 – Meat, poultry, fish, eggs and their products
- SC 7 - Spices, culinary herbs and condiments
- SC8 – Tea
- **SC 9 – Microbiology**
- SC 10 – Animal feeding stuffs
- **SC 11 – Animal and vegetable fats and oils**



## ISO/TC 34 – Food products

- SC 12 – Sensory analysis
- SC 15 - Coffee
- SC 16 – Horizontal methods for biomarker analysis
- SC 17 – Management systems for food safety
- SC 18 – Cocoa
  
- WG 14 – Vitamins, carotenoids and other nutrients
- WG 16 – Animal welfare
- WG 18 – Natural food ingredients





## **ISO standard ('ISO XXXX'):**

2 x consensus

1. Level of experts
2. Level of participating countries

Used by regulatory bodies as referee method

## **ISO Workshop Agreement ('IWA XXXX')**

- Fast, smaller group of experts
- Intermediate step to full standard



## **CEN - European standardization organization**

**CEN/TC 275** - Food analysis – Horizontal methods

**CEN/TC 302** - Milk and milk products – Methods of analysis and sampling

**CEN/TC 307** - Oilseeds, vegetable, animal fats, oils and their by-products

**CEN/TC 338** - Cereal and cereal products



## **CEN/TC 275 – Food analysis – Horizontal methods**

WG 1– Sulfites

WG 2 – Sweeteners

WG 3 – Pesticides and PCB's in foods of animal origin

WG 4 – Pesticides in foods of plant origin

WG 5 – Biotoxins (mycotoxins and plant toxins)

WG 6 – Microbiology

WG 7 – Nitrate and nitrite





## **CEN/TC 275 – Food analysis – Horizontal methods**

WG 8 – Irradiated foodstuffs

WG 9 – Vitamins and carotenoids

WG 10 – Elements and their chemical species

WG 11 – Genetically modified foodstuffs

WG 12 – Food allergens

WG 13 – Process contaminants

WG 14 – Marine biotoxins



## ISO/CEN standards – some characteristics

- Cooperation: Vienna Agreement
- Collaboratively validated (ISO 5725 or IUPAC protocol)
- CEN standards: EC Mandate (e.g. funding for collab studies e.g. microbiology, mycotoxins, process contaminants)
- **‘Vertical’** standards <-> **‘Horizontal’** standards

*‘...Horizontal where possible, vertical where needed...’.*



## Some examples

**EN 12821** - Foodstuffs - Determination of vitamin D by high performance liquid chromatography - Measurement of cholecalciferol (D3) or ergocalciferol (D2)

The values are:

Margarine:  $\bar{x} = 12,3 \mu\text{g}/100 \text{ g}$   $R = 2,66 \mu\text{g}/100 \text{ g}$

Milk powder:  $\bar{x} = 14,3 \mu\text{g}/100 \text{ g}$   $R = 2,21 \mu\text{g}/100 \text{ g}$

Milk:  $\bar{x} = 0,418 \mu\text{g}/100 \text{ g}$   $R = 0,106 \mu\text{g}/100 \text{ g}$

Liquid infant formula:  $\bar{x} = 1,38 \mu\text{g}/100 \text{ g}$   $R = 0,47 \mu\text{g}/100 \text{ g}$

Cooking oil:  $\bar{x} = 4,61 \mu\text{g}/100 \text{ g}$   $R = 3,11 \mu\text{g}/100 \text{ g}$

Margarine:  $\bar{x} = 8,39 \mu\text{g}/100 \text{ g}$   $R = 1,60 \mu\text{g}/100 \text{ g}$

Infant formula:  $\bar{x} = 10,1 \mu\text{g}/100 \text{ g}$   $R = 2,0 \mu\text{g}/100 \text{ g}$

Fish oil:  $\bar{x} = 11,6 \mu\text{g}/100 \text{ g}$   $R = 5,8 \mu\text{g}/100 \text{ g}$



## EN 12822 -Foodstuffs - Determination of vitamin E by high performance liquid chromatography - Measurement of $\alpha$ -, $\beta$ -, $\gamma$ - and $\delta$ - tocopherol

### 8.3 Reproducibility

The absolute difference between two single test results obtained on identical material reported by two laboratories will exceed the reproducibility limit  $R$  in not more than 5 % of the cases.

The values are:

Margarine	$\alpha$ -tocopherol	$\bar{x} = 24,09 \text{ mg/100 g}$	$R = 4,18 \text{ mg/100 g}$
Milk powder	$\alpha$ -tocopherol	$\bar{x} = 9,89 \text{ mg/100 g}$	$R = 1,96 \text{ mg/100 g}$
Milk powder	$\alpha$ -tocopherol	$\bar{x} = 10,2 \text{ mg/100 g}$	$R = 3,705 \text{ mg/100 g}$
	$\beta$ -tocopherol	$\bar{x} = 0,081 \text{ mg/100 g}$	$R = 0,046 \text{ mg/100 g}$
	$\gamma$ -tocopherol	$\bar{x} = 1,989 \text{ mg/100 g}$	$R = 0,978 \text{ mg/100 g}$
	$\delta$ -tocopherol	$\bar{x} = 0,280 \text{ mg/100 g}$	$R = 0,134 \text{ mg/100 g}$
Oat powder	$\alpha$ -tocopherol	$\bar{x} = 0,279 \text{ mg/100 g}$	$R = 0,133 \text{ mg/100 g}$
	$\beta$ -tocopherol	$\bar{x} = 0,057 \text{ mg/100 g}$	$R = 0,030 \text{ mg/100 g}$



## prEN 16858 - Food analysis — Determination of melamine and cyanuric acid in foodstuffs by liquid chromatography and tandem mass spectrometry (LC-MS/MS)

### 9.3 Reproducibility

The absolute difference between two single test results found on identical test material reported by two laboratories will exceed the reproducibility limit  $R$  in not more than 5 % of the cases.

#### The values for melamine are:

$\bar{x} = 1,26$  mg/kg  $R = 0,680$  mg/kg (infant formula milk based)

$\bar{x} = 0,73$  mg/kg  $R = 0,626$  mg/kg (infant formula soy based)

$\bar{x} = 1,04$  mg/kg  $R = 0,647$  mg/kg (milk powder)

$\bar{x} = 1,43$  mg/kg  $R = 0,453$  mg/kg (whole milk)

$\bar{x} = 1,06$  mg/kg  $R = 0,657$  mg/kg (soy milk)

$\bar{x} = 0,71$  mg/kg  $R = 0,609$  mg/kg (milk chocolate)

#### The values for cyanuric acid are:

$\bar{x} = 0,83$  mg/kg  $R = 0,402$  mg/kg (infant formula milk based)

$\bar{x} = 0,87$  mg/kg  $R = 0,450$  mg/kg (infant formula soy based)

$\bar{x} = 1,45$  mg/kg  $R = 0,375$  mg/kg (milk powder)

$\bar{x} = 0,57$  mg/kg  $R = 0,214$  mg/kg (whole milk)

## EN 16618 - Food analysis - Determination of acrylamide in food by liquid chromatography tandem mass spectrometry (LC-ESI-MS-MS)

Table B.2 — Precision data for acrylamide in potato crisps, mashed potato powder and crisp bread

Sample	Potato crisps	Spiked mashed potato powder	Commercial potato crisps	Crisp bread
Source	SP <sup>a</sup>	RS <sup>a</sup>	RS <sup>a</sup>	ERM®-BD272
Year of interlaboratory test	2007	2007	2007	2007
Number of laboratories	16	16	16	16
Number of non-compliant laboratories	1	0	0	0
Number of laboratories retained after eliminating outliers	14	16	14	13
Number of outliers (laboratories)	1	0	2	3
Number of accepted results	14	16	14	13
Mean value, $\bar{x}$ , µg/kg	324	500	628	980
Repeatability standard deviation $s_r$ , µg/kg	19,5	27,1	55,9	30,7
Repeatability relative standard deviation, $RSD_r$ , %	6,0	5,4	8,9	3,1
Repeatability limit $r$ [ $r = 2,8 \times s_r$ ], µg/kg	54,6	76,0	157	86,0
Reproducibility standard deviation $s_R$ , µg/kg	41,0	43,9	82,7	52,9
Reproducibility relative standard deviation, $RSD_R$ , %	12,7	8,8	13,2	5,4
Reproducibility limit $R$ [ $R = 2,8 \times s_R$ ], µg/kg	115	123	232	148
Recovery, %	- <sup>b</sup>	- <sup>b</sup>	- <sup>b</sup>	- <sup>b</sup>
HorRat value, according to [6]	0,7	0,5	0,8	0,3
HorRat value, according to [7]	0,7	0,5	0,8	0,3
<p>a SP = specially prepared for the study, RS = from retail store</p> <p>b not determined as recovery is corrected by isotopic labelled acrylamide</p>				





## EN 14573 - Foodstuffs - Determination of 3-monochloropropane-1,2-diol by GC/MS

### 7.3 Reproducibility

The absolute difference between two single test results on identical test material reported by two laboratories will exceed the reproducibility limit  $R$  in not more than 5 % of the cases.

The values are:

Hydrolyzed vegetable protein	$\bar{x} = 0,029$ mg/kg	$R = 0,010$ mg/kg
Malt extract	$\bar{x} = 0,055$ mg/kg	$R = 0,021$ mg/kg
Soup powder	$\bar{x} = 0,045$ mg/kg	$R = 0,022$ mg/kg
Dried bread crumbs	$\bar{x} = 0,030$ mg/kg	$R = 0,018$ mg/kg
Salami	$\bar{x} = 0,016$ mg/kg	$R = 0,017$ mg/kg
Cheese alternative	$\bar{x} = 0,043$ mg/kg	$R = 0,027$ mg/kg



## Summary

- CEN ISO methods available and tested for dairy / IF
- Methods available but not tested for dairy / IF (but may be suitable!)
- [www.cen.eu](http://www.cen.eu) or [www.iso.org](http://www.iso.org)
- See what's already out there and make use of it!



**Thank you!**