

## **EuroFIR quality framework to improve national food composition databanks.**

Isabel Castanheira<sup>(1)</sup>, Mark Roe<sup>(2)</sup>, Gaida Lapitajs<sup>(3)</sup>,  
Maria Antónia Calhau<sup>(1)</sup>, Paul Finglas<sup>(2)</sup>

<sup>(1)</sup>INSA, <sup>(2)</sup>IRMM, IFR  
8th IFCD 1-3 October, 2009 , Bangkok, Thailand



## **Outline**

- **Five years of work on Quality Management Systems**
- **EuroFIR Collaborations**
- **CEN Standard**
- **Recomendations from evaluators**
- **Audits Models**

**EuroFIR** Why Harmonization

**Fiber, Same method ??**  
**Protein, Factor reported??**  
**VitaminB6, HPLC or Microbiological ??**  
**Zinc AAS or ICP-MS (LoD) ??**  
**Selenium Graphite or HPLC-ICP-MS ??**

natural variations?      Artificial variations??  
Sampling Plan ?  
Description??  
Laboratory?? poor or good performance ??  
Compilation process: hazards identified and prevented ??

	Bread FCDB (1)	Bread FCDB (2)	Bread FCDB (3)
D. Fiber	4.0	8.2	5.6
Protein (g)	8.0	6.2	9.3
Vit B1 (mg)	0.118	0.21	0.192
Vit B6 (mg)	0.058	0.074	0.117
Zinc (mg)	0.626	1.6	0.964
Selenium (µg)	2.56	3.7	3.2

2005      2000      1999      2009  
National values?

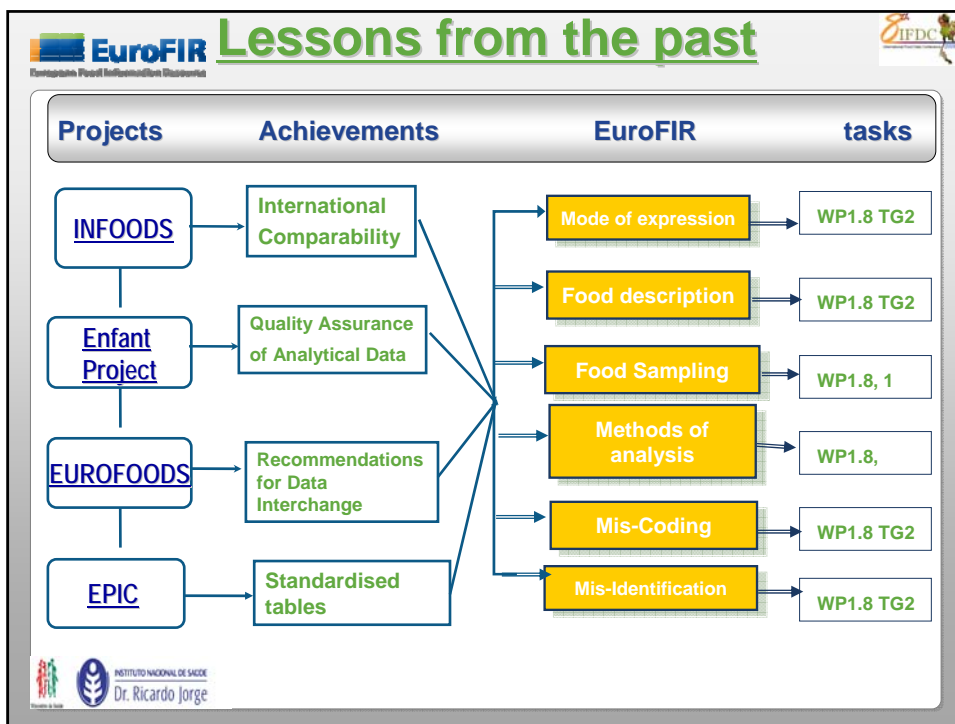
Dr. Ricardo Jorge

**EuroFIR** World Health Organization

## Evidence for risk factors and protective factors concerning CVD

Risk	Convincing	Dietary Composition															
↑	<ul style="list-style-type: none"> <li>Saturated fatty acids</li> <li>Trans-fatty acids</li> <li>Myristic &amp; palmitic acid</li> <li>High sodium intake</li> <li>High alcohol intake</li> <li>Overweight &amp; obesity</li> </ul>	<table border="1"> <thead> <tr> <th>Dietary Factor</th> <th>Recommended in TRS 916 (2003)</th> <th>Recommended in TRS 797 (1990)</th> </tr> </thead> <tbody> <tr> <td>Cholesterol</td> <td>&lt; 300 mg/day</td> <td>same</td> </tr> <tr> <td>Sodium chloride (sodium)</td> <td>&lt;5 g/day (&lt;2 g/day)</td> <td>&lt;6 g/day</td> </tr> <tr> <td>Fruits and vegetables</td> <td>≥ 400 g per day</td> <td></td> </tr> <tr> <td>Total dietary fiber/Non-starch polysaccharides (NSP)</td> <td>(&gt;25 g, or 20g/d of NSP) from whole grain cereals, fruits, and vegetables</td> <td>27 to 40 total 16 to 24 NSP</td> </tr> </tbody> </table>	Dietary Factor	Recommended in TRS 916 (2003)	Recommended in TRS 797 (1990)	Cholesterol	< 300 mg/day	same	Sodium chloride (sodium)	<5 g/day (<2 g/day)	<6 g/day	Fruits and vegetables	≥ 400 g per day		Total dietary fiber/Non-starch polysaccharides (NSP)	(>25 g, or 20g/d of NSP) from whole grain cereals, fruits, and vegetables	27 to 40 total 16 to 24 NSP
Dietary Factor	Recommended in TRS 916 (2003)		Recommended in TRS 797 (1990)														
Cholesterol	< 300 mg/day	same															
Sodium chloride (sodium)	<5 g/day (<2 g/day)	<6 g/day															
Fruits and vegetables	≥ 400 g per day																
Total dietary fiber/Non-starch polysaccharides (NSP)	(>25 g, or 20g/d of NSP) from whole grain cereals, fruits, and vegetables	27 to 40 total 16 to 24 NSP															
↓	<ul style="list-style-type: none"> <li>Linoleic acid</li> <li>Fish and fish oils (EPA &amp; DHA)</li> <li>Potassium</li> <li>Fruits (including berries) &amp; vegetables</li> <li>Low to moderate alcohol intake</li> <li>Physical activity, regular</li> </ul>																

Dr. Ricardo Jorge

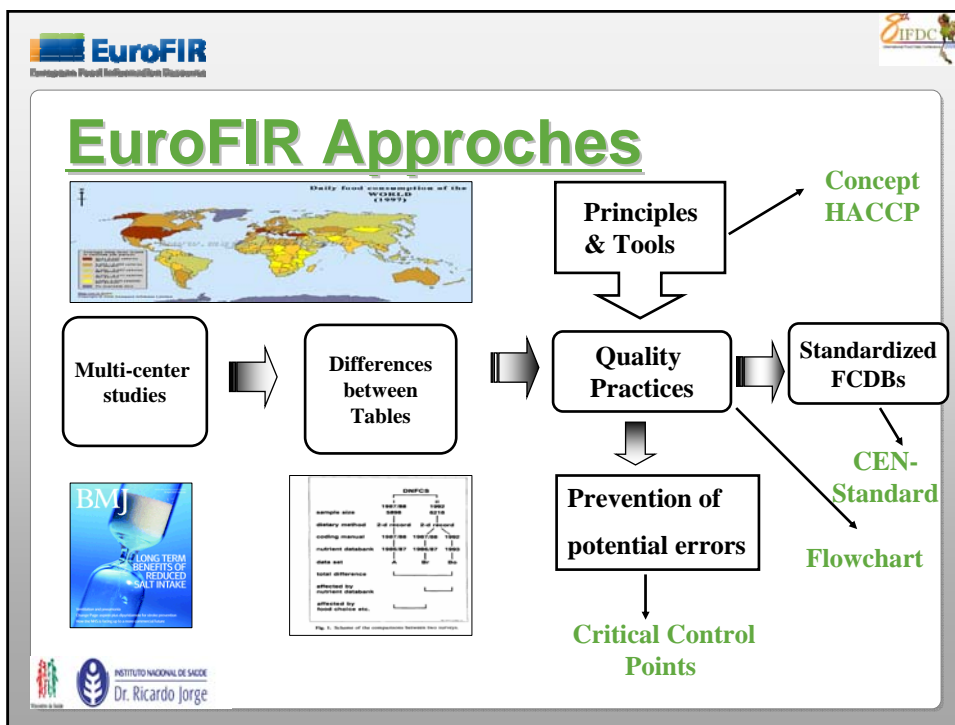


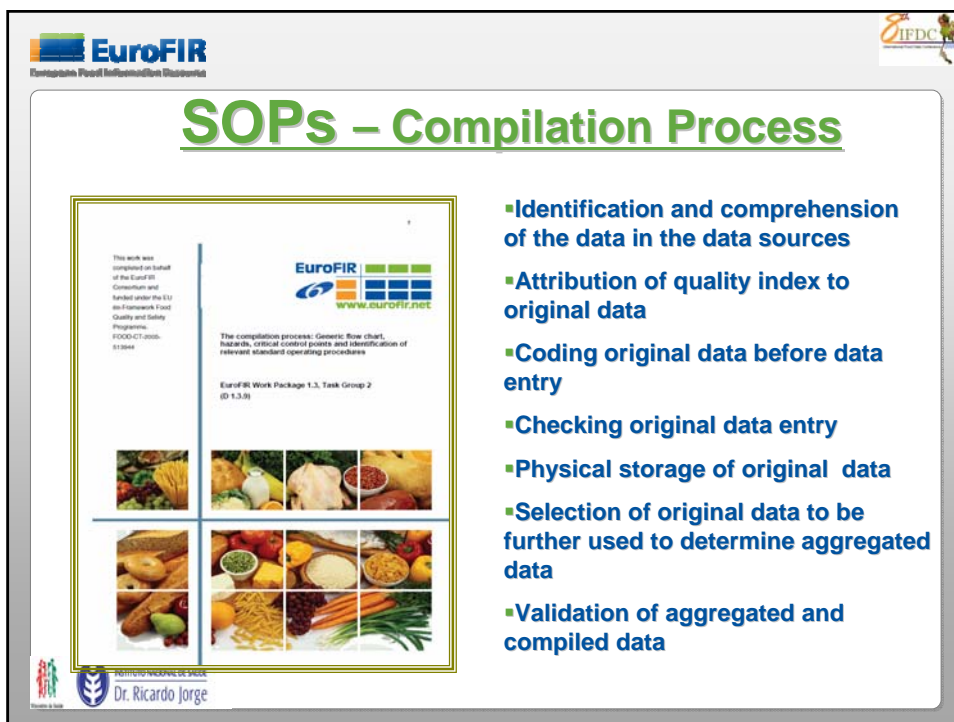
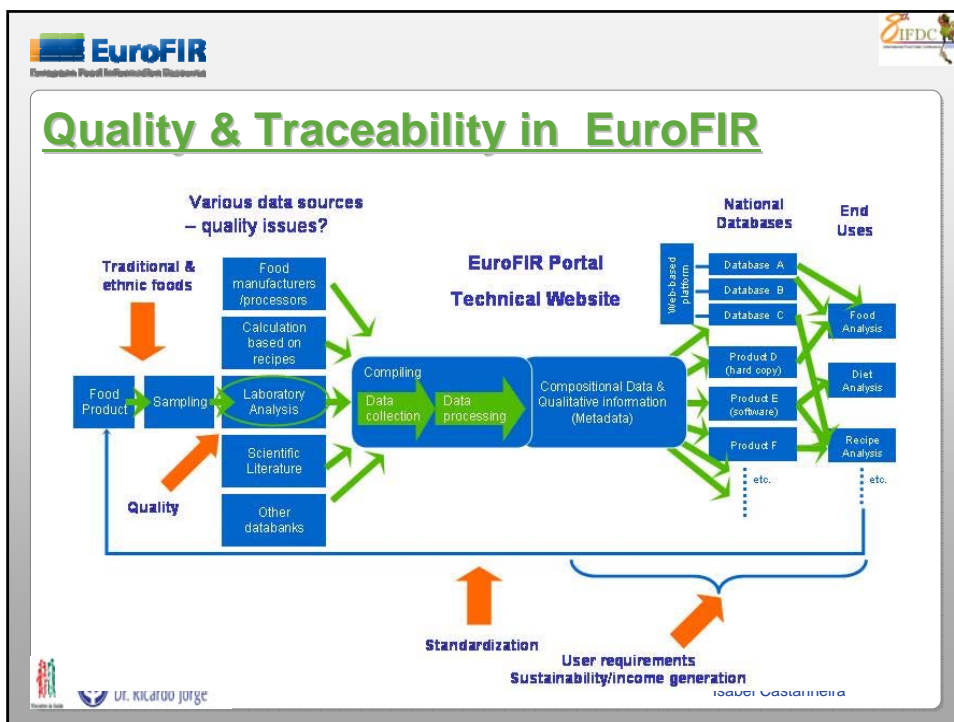
\_\_\_\_\_

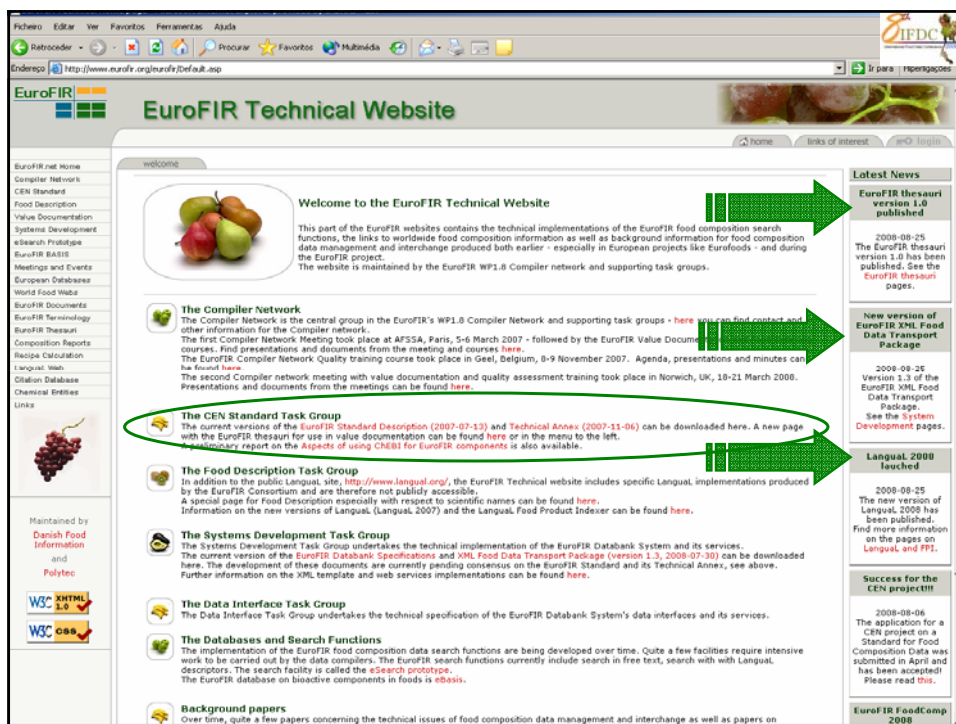
\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



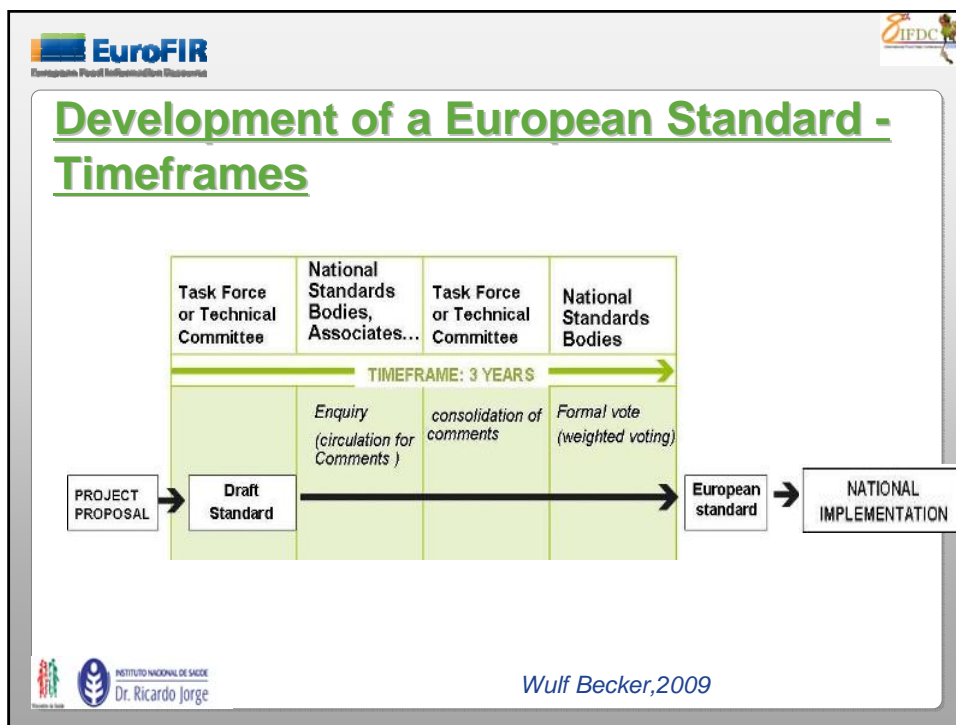




The screenshot shows the EuroFIR Technical Website interface. The main content area is titled "Welcome to the EuroFIR Technical Website" and contains several sections:

- The Compiler Network:** The Compiler Network is the central group in the EuroFIR's WP1.0 Compiler Network and supporting task groups. The first Compiler Network Meeting took place at AFSSA, Paris, 5-6 March 2007. The EuroFIR Compiler Network Quality training course took place in Geel, Belgium, 8-9 November 2007.
- The CEN Standard Task Group:** The current versions of the EuroFIR Standard Description (2007-07-13) and Technical Annex (2007-11-06) can be downloaded here. A new page with the EuroFIR thesauri for use in value documentation can be found here or in the menu to the left.
- The Food Description Task Group:** In addition to the public Languag site, the EuroFIR Technical website includes specific Languag implementations produced by the EuroFIR Consortium and are therefore not publicly accessible.
- The Systems Development Task Group:** The Systems Development Task Group undertakes the technical implementation of the EuroFIR Databank System and its services.
- The Data Interface Task Group:** The Data Interface Task Group undertakes the technical specification of the EuroFIR Databank System's data interfaces and its services.
- The Databases and Search Functions:** The implementation of the EuroFIR food composition data search functions are being developed over time. Quite a few facilities require intensive work to be carried out by the data compilers.
- Background papers:** Over time, quite a few papers concerning the technical issues of food composition data management and interchange as well as papers on other information for the Compiler network.

On the right side, there is a "Latest News" section with several entries, including "EuroFIR thesauri version 1.0 published" and "New version of EuroFIR XML Food Data Transport Package".



**Development of a European Standard - Timeframes**

	National Standards Bodies, Associates...	National Standards Bodies	
	Task Force or Technical Committee	Task Force or Technical Committee	National Standards Bodies
	<b>TIMEFRAME: 3 YEARS</b>		
	Enquiry (circulation for Comments)	consolidation of comments	Formal vote (weighted voting)
PROJECT PROPOSAL	Draft Standard	European standard	NATIONAL IMPLEMENTATION

Wulf Becker, 2009

## CEN –Standard

- CEN-TC-387
  - SIS- Chair Swedish Organization for Standardization
- Organizations
  - EuroFIR partners representatives of National Standardization Organizations
  - GS1
  - Other members
- Aim
  - Establish a common European CEN-standard on food composition data enabling the unambiguous identification and description of food composition data and its quality in e.g. databases, for dissemination and interchange.

## Standardisation work – progress

- SIS TK505 committee "Food data" established 2007
  - Members representing SIS Swedish Standards Institute, NFA, Swedish food manufacturers, retailers, consumers, dieticians
- CEN/TC387 "Food composition data" Project Committee established April 2008
  - Led by SIS Swedish Standards Institute
  - Members from 9 national standardisation bodies
    - SE, F, DK, FIN, I, NL, P, B, UK (+ A, CY, D, NO observers)
  - Programme of work adopted
  - 2 plenary meetings + conference calls
  - Draft standard outline June 2009
  - First working draft August 2009

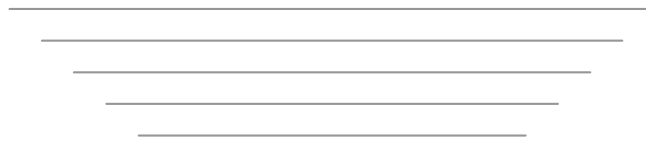
**EuroFIR**  
European Food Information Research Institute

**IFDC**

## CEN Standard Achievements

- Establishment of CEN project committee an important milestone
  - standard is a technical specification
- Liaison with GS1 initiative will enhance coverage and uptake of future standard
- Controlled vocabularies (thesauri) as informative annex
  - provide more flexibility (at international level)
  - require agreement among parties on which to use in data interchange
  - can be changed to normative in future
- More involvement in standardisation work appreciated

 INSTITUTO NACIONAL DE SAUDE  
Dr. Ricardo Jorge



**EuroFIR**  
European Food Information Research Institute

**IFDC**

## Training





Training Course on  
Quality Issues for  
Compilers

Geel, 8th, 9th November  
2007

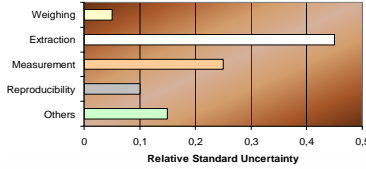
- Initial Training to ensure that members can competently perform designated tasks with high level of confidence.
- Ongoing training sessions and periodic short courses to share experiences and to learn from each others
- Professional Development encouragement to participate in professional societies, conferences related with food science and human nutrition.

 INSTITUTO NACIONAL DE SAUDE  
Dr. Ricardo Jorge

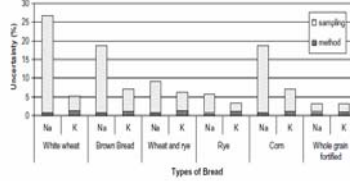
**EuroFIR**  
European Food Information Resources

**Measurement Uncertainty**

- **Metrological approach** to express the dispersion of the results
- **Uncertainty sources**
  - Method of analysis
  - Sampling
- **Types of Uncertainty**
  - Standard uncertainty
  - Overall uncertainty
- **Reporting uncertainty**
  - $U = K \cdot \text{combined uncertainty}$



Stage	Relative Standard Uncertainty
Weighing	~0.05
Extraction	~0.45
Measurement	~0.25
Reproducibility	~0.15
Others	~0.15



Bread Type	Sampling (%)	Method (%)
White wheat	~25	~5
Brown Bread	~15	~5
Wheat and rye	~10	~5
Rye	~5	~5
Corn	~15	~5
Whole grain fortified	~5	~5

Fig. 1. The impact of sampling and analytical procedure in overall uncertainty.

**Recommendation for Laboratories**

**INSTITUTO NACIONAL DE SAUDE**  
Dr. Ricardo Jorge

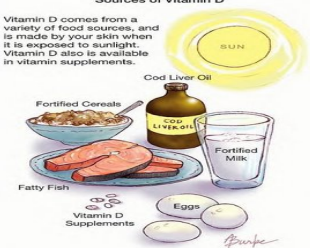
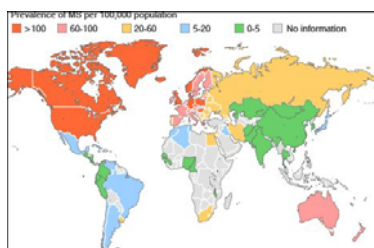
**EuroFIR**  
European Food Information Resources

**IMEKO TC 23– EuroFIR Collaboration**

**IMEKO -TC 23 Food and Nutrition Metrology**

**Sources of Vitamin D**

Vitamin D comes from a variety of food sources, and is made by your skin when it is exposed to sunlight. Vitamin D also is available in vitamin supplements.

**Promote Metrology in Food Composition Databanks**

**Traceability to SI units**

**Use of Reference Materials**

**Sources of Uncertainty (variations in analytical process)**

**INSTITUTO NACIONAL DE SAUDE**  
Dr. Ricardo Jorge

## Metrology in Clinical Nutrition

Relationship between Glaucoma and Selenium Levels in Plasma and Aqueous Humor

- Selenium intake estimated from FCDBs
- Selenium in plasma and Aqueous humor determined by HPLC-ICP-MS
- Conclusion
  - limited nutritional data was collected, it was impossible to determine the subjects' long-term dietary intake of selenium
  - Metrology is necessary to evaluate qualitative issues
  - suggest selenium-related pathology



## Compiler Certification

- Formal certification, e.g. ISO 9001 ideal but not realistic within timescale
- Certification Plan based on consensus
- Informal standard based on generic compilation process best option
  - SOPs supporting individual organisation's compilation procedure
  - Records of management systems related to process e.g. training records, sub-contractor details, analytical quality control records

**EuroFIR**  
European Food Information Resource

**Quality System Implementation**

- Principle**  
QMS should fit both EuroFIR and compiler organization quality management requirements.

The diagram consists of two overlapping rounded rectangular boxes. The left box is blue and contains the text 'Management Requirements' and 'National Organization-QS'. The right box is white with a blue border and contains the text 'Technical Requirements', 'Compilation Process', and 'EuroFIR Specifications'. The boxes overlap in the center.

**Management Requirements**  
**National Organization-QS**

**Technical Requirements**  
**Compilation Process**  
**EuroFIR Specifications**

INSTITUTO NACIONAL DE SAUDE  
Dr. Ricardo Jorge

Luisa Oliveira – INSA P24

2009/09/09

**EuroFIR**  
European Food Information Resource

**EuroFIR Quality System Structure**

The flowchart is organized into five horizontal levels. At the top is 'Quality Policy'. Below it is 'CEN Standard; Flowchart Compilation Process; Languag; Data Quality System value documentation'. This leads to three boxes: 'Responsibilities', 'SOPs', and 'Training'. 'Responsibilities' leads to 'Datasets Bioactives'. 'SOPs' leads to 'Ethnic' and 'Traditional'. 'Training' leads to 'Initial' and 'Ongoing'. 'Basic tasks' and 'Supervision' are listed under 'Responsibilities'. 'Writting' and 'Revising' are listed under 'SOPs'. 'International Programmes' is connected to the top level.

**Top of Quality System**  
**Quality Requirements**  
**Quality Practices**  
**Specific Aims**  
**Specific activities**

Quality Policy

CEN Standard; Flowchart Compilation Process; Languag; Data Quality System value documentation

Responsibilities  
SOPs  
Training

International Programmes

▪ Datasets Bioactives  
▪ Ethnic  
▪ Traditional

▪ Basic tasks  
▪ Supervision  
▪ Writting  
▪ Revising  
▪ Initial  
▪ Ongoing

INSTITUTO NACIONAL DE SAUDE  
Dr. Ricardo Jorge

**EuroFIR**  
European Food Information Resource

**Pilot Audits**

- Co-operative audit conducted between EuroFIR partners and overseas for mutual benefits
- A horizontal audit: an detailed assessment of each requirements applied to total activities
- Vertical audits a systematic evaluation of all requirements associated to each activity

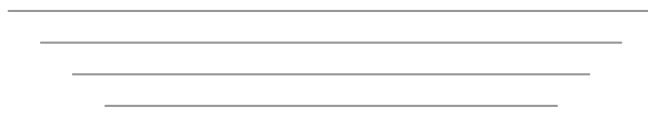
**Sweden**



**Portugal**



**INSTITUTO NACIONAL DE SAUDE**  
Dr. Ricardo Jorge



**EuroFIR**  
European Food Information Resource

**Benefits of Quality**

- Food Composition Databank
  - “Combining quality systems and food composition activities endows FCDB with flexibility, consistency and transparency, and facilitates their monitoring and assessment.”
- Analytical Process
  - “Without a defined quality assurance programme all analytical results must be suspected”
- Compilation
  - “Implementation of good scientific practice provide basis for transparency and confidence that data is comparable across different databases“

**INSTITUTO NACIONAL DE SAUDE**  
Dr. Ricardo Jorge

Isabel Castanheira

**EuroFIR**  
European Food Information Research

**Conclusions**



**QMS are a contribution to reduce FCDBs artificial differences**

**INSTITUTO NACIONAL DE SAUDE**  
Dr. Ricardo Jorge

---

---

---

---

**EuroFIR**  
European Food Information Research

**Acknowledgements**

EuroFIR is funded by European Commission's Research Directorate General under the "Food Quality and Safety Programme FOOD-CT-2005-513944" of Sixth Framework Programme for Research and Technological Development

**INSTITUTO NACIONAL DE SAUDE**  
Dr. Ricardo Jorge