Further Developments in EuroFIR BASIS - an on-line composition and biological effects bioactive compound database

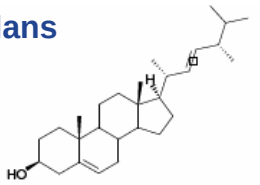
Lucinda Black, *University College Cork, Ireland*

Jenny Plumb, Jorn Gry, Paul Kroon, Folmer Eriksen, Kirsten Pilegaard, Paul Finglas and Mairead Kiely on behalf of the EuroFIR consortium

8IFDC Bangkok 1-3th October 2009

Overview

- What is EuroFIR BASIS?
- Quality assurance
- Usability testing
- Reporting
- Current status and future plans



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EuroFIR BASIS – key features

On-line database

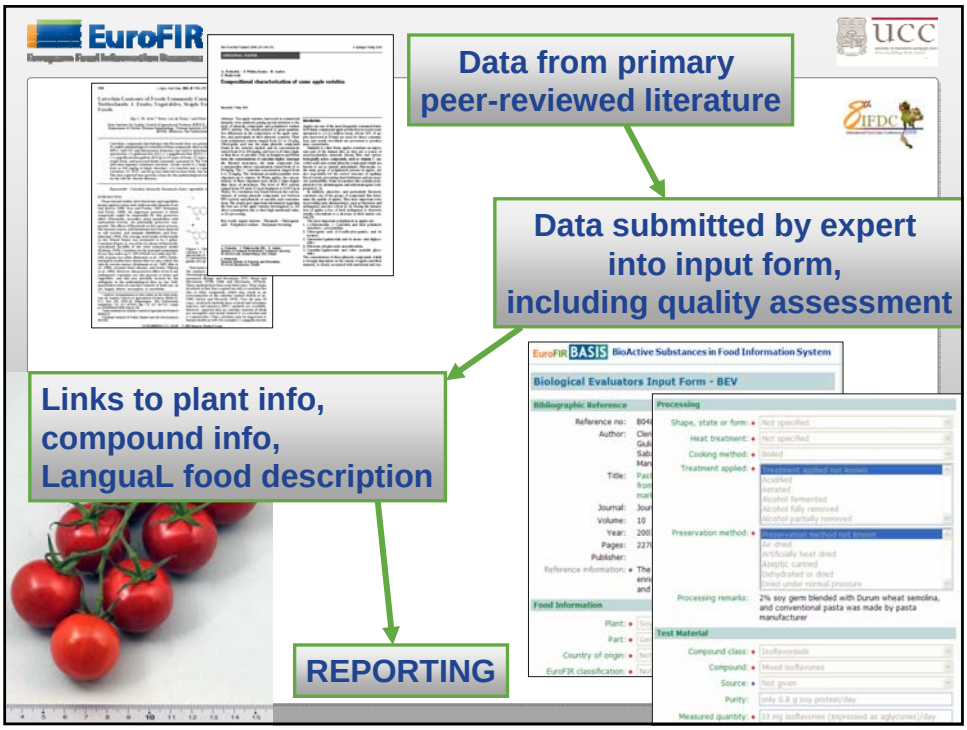
Composition AND biological activity data

16 major bioactive compound classes

Plants and plant-based foods

Peer-reviewed literature

- Anthocyanins
- Capsaicinoids
- Carotenoids
- Coumestans
- Cysteine sulphoxides
- Flavanols
- Flavanones
- Flavones
- Flavonols
- Glucosinolates
- Isoflavones
- Lignans
- Polyacetylenes
- Stilbenes
- Pro(antho)cyanidins
- Phytosterols



Applications

Food authorities	Regulatory issues Assessing health claims
Researchers	Estimating exposure levels Epidemiological studies Supporting submissions to research Evaluation of GM foods
Industry	New product development Functional ingredients

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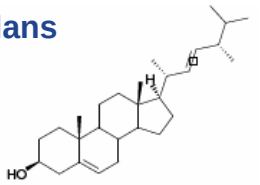

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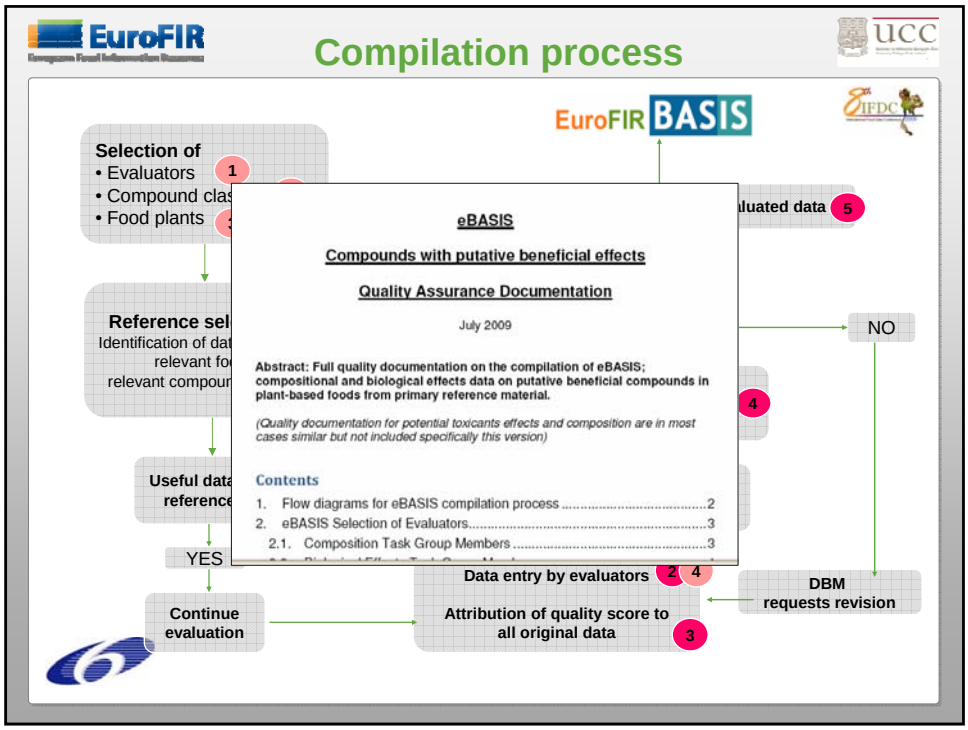

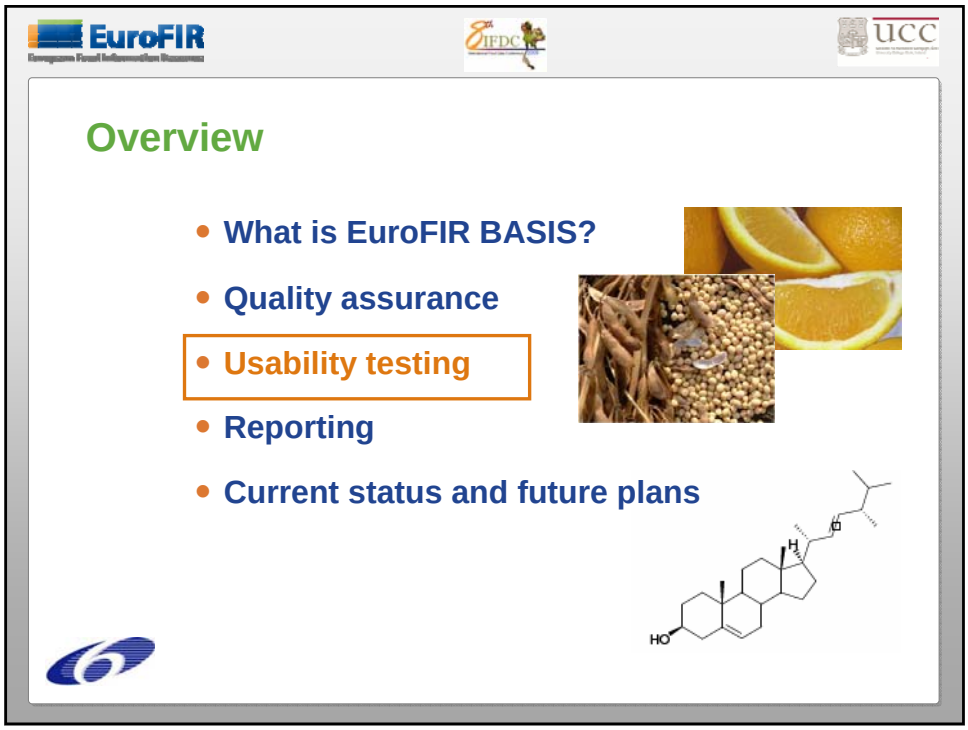

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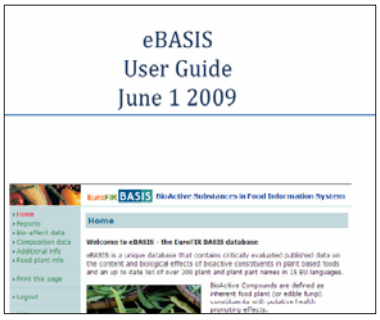
Usability testing

To establish an understanding of potential user groups and their requirements

- **7 users from target groups** (food regulatory bodies, researchers, food industry)
- **Commented on key qualities of the database:**
  - **LEARNABILITY**– can users easily grasp how to use the software the first time?
  - **EFFICIENCY**– can they complete tasks effectively?
  - **MEMORABILITY**– do they remember how the next time?
  - **ERRORS**– the system should have a low error rate
  - **SATISFACTION**– do they feel positive about the experience?

Outcomes

- **Positive scores for all attributes**
- **Suggestions included:**
  - Improvements to layout of reporting
  - Access to supporting data
  - Inclusion of 'help' tools
  - Worked examples



- **These have since been addressed:**
  - Reporting tool finalised and user-friendly
  - Supporting data on plants and compound classes
  - Full user manual including worked examples

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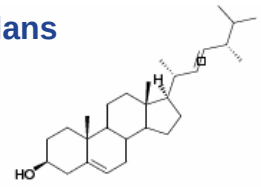

Composition data

Search for Bio-effect data
Search for bio-effect data, via one or any
biomarker and study type.

Search for Composition data
Search for compositional data, via individua
combination of both compound and food.

Search for Technical data
Search for individual reference details and
Retrieve supplementary information on com

Bio Composition data

Click the 🗑 icon to delete a search criterion or an output field.

[New search]

New search | Save search | Use saved search

1. Search for Bio Composition data

Select a Search type and click a Parameter to add search crite
are limited by the current search criteria. Currently **2,983** data

Search type ○ Basic ◉ Full

Parameter	Selected Search Criteria
Food plant name	
Plant part	
Country of origin	
Growing condition	
GMO	
Cooking method	
Compound class	🗑 Phytosterols
Compound name	
Analytical method name	
Unit	
Quality code	

2. Create your Bio Composition report

Please add output fields as required: Add output fields | View

Selected Output Fields

- 🗑 Reference no
- 🗑 Plant
- 🗑 Part
- 🗑 Compound
- 🗑 Average level
- 🗑 Unit
- 🗑 Sample year
- 🗑 Sample plan
- 🗑 Quality code

VIEW REPORT

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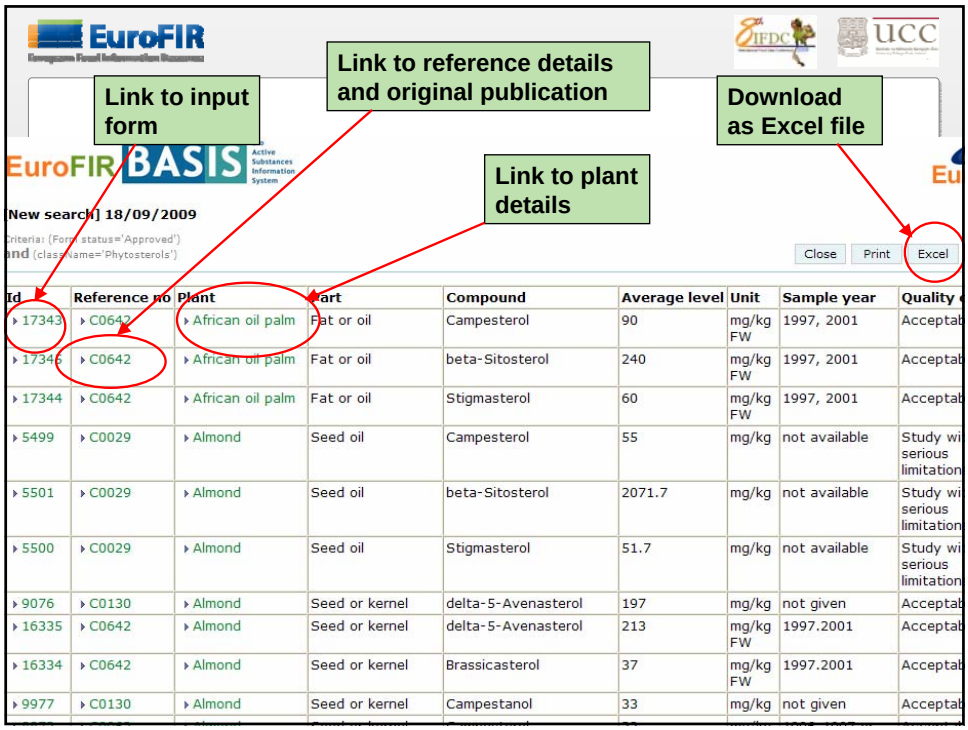
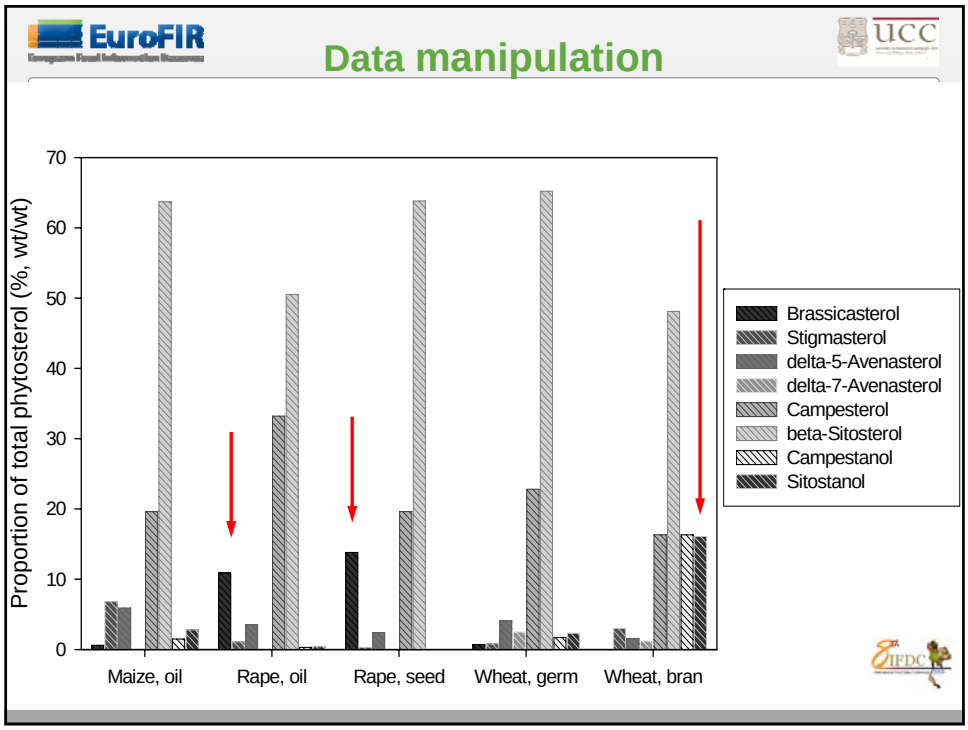


Id	Reference no	Plant	Part	Compound	Average level	Unit	Sample year	Quality
17343	C0642	African oil palm	Fat or oil	Campesterol	90	mg/kg FW	1997, 2001	Acceptab
17346	C0642	African oil palm	Fat or oil	beta-Sitosterol	240	mg/kg FW	1997, 2001	Acceptab
17344	C0642	African oil palm	Fat or oil	Stigmasterol	60	mg/kg FW	1997, 2001	Acceptab
5499	C0029	Almond	Seed oil	Campesterol	55	mg/kg	not available	Study wi serious limitation
5501	C0029	Almond	Seed oil	beta-Sitosterol	2071.7	mg/kg	not available	Study wi serious limitation
5500	C0029	Almond	Seed oil	Stigmasterol	51.7	mg/kg	not available	Study wi serious limitation
9076	C0130	Almond	Seed or kernel	delta-5-Avenasterol	197	mg/kg	not given	Acceptab
16335	C0642	Almond	Seed or kernel	delta-5-Avenasterol	213	mg/kg FW	1997.2001	Acceptab
16334	C0642	Almond	Seed or kernel	Brassicasterol	37	mg/kg FW	1997.2001	Acceptab
9977	C0130	Almond	Seed or kernel	Campestanol	33	mg/kg	not given	Acceptab



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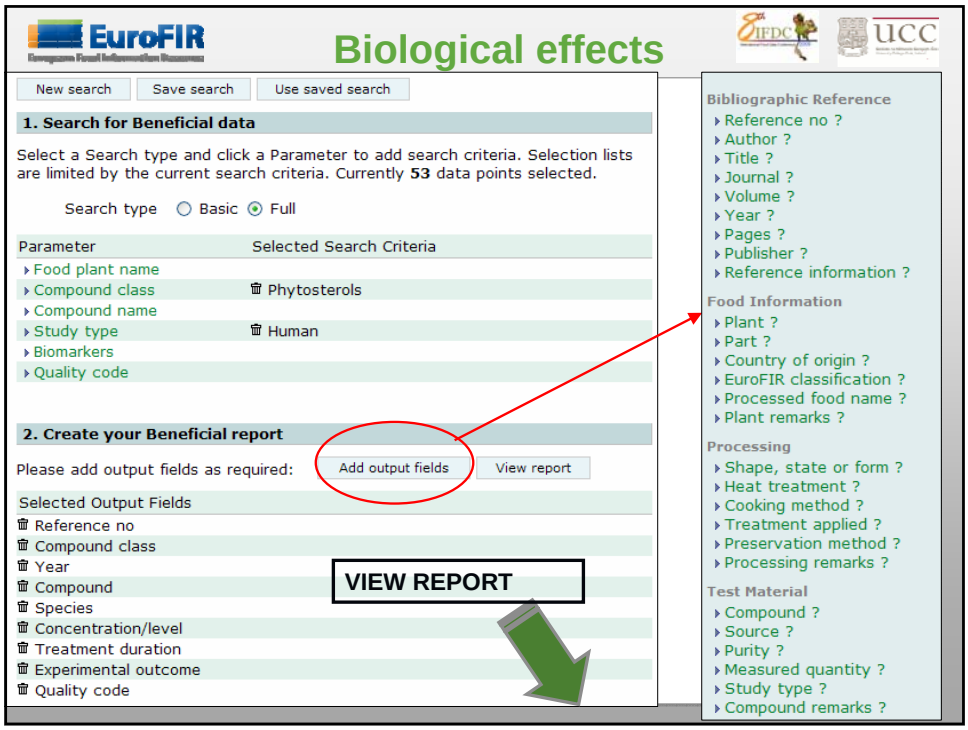
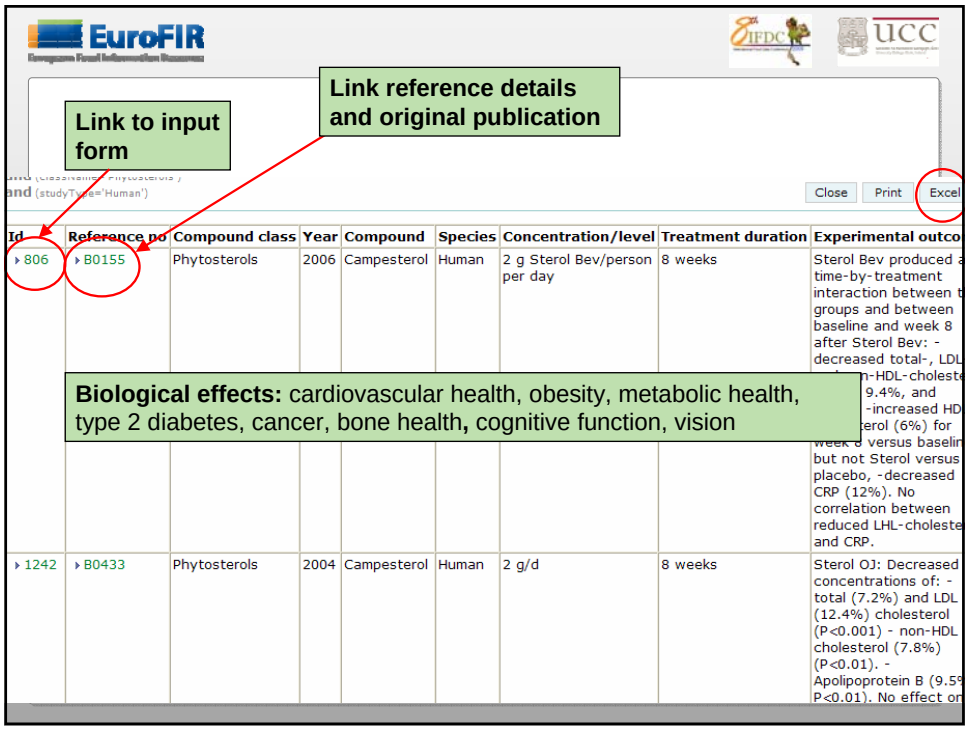

EuroFIR
Biological effects
New search
Save search
Use saved search
1. Search for Beneficial data
Select a Search type and click a Parameter to add search criteria. Selection lists are limited by the current search criteria. Currently 53 data points selected.
Search type Basic Full
Parameter
Selected Search Criteria
Food plant name
Compound class
Phytosterols
Compound name
Study type
Human
Biomarkers
Quality code
2. Create your Beneficial report
Please add output fields as required:
Add output fields
View report
Selected Output Fields
Reference no
Compound class
Year
Compound
Species
Concentration/level
Treatment duration
Experimental outcome
Quality code
VIEW REPORT
Bibliographic Reference
Reference no ?
Author ?
Title ?
Journal ?
Volume ?
Year ?
Pages ?
Publisher ?
Reference information ?
Food Information
Plant ?
Part ?
Country of origin ?
EuroFIR classification ?
Processed food name ?
Plant remarks ?
Processing
Shape, state or form ?
Heat treatment ?
Cooking method ?
Treatment applied ?
Preservation method ?
Processing remarks ?
Test Material
Compound ?
Source ?
Purity ?
Measured quantity ?
Study type ?
Compound remarks ?


EuroFIR
Link to input form
Link reference details and original publication
Close
Print
Excel
Id
Reference no
Compound class
Year
Compound
Species
Concentration/level
Treatment duration
Experimental outco
806
B0155
Phytosterols
2006
Campesterol
Human
2 g Sterol Bev/person per day
8 weeks
Sterol Bev produced a time-by-treatment interaction between t groups and between baseline and week 8 after Sterol Bev: -decreased total-, LDL
9.4%, and
-increased HD
terol (6%) for
week 8 versus baselin
but not Sterol versus placebo, -decreased CRP (12%). No correlation between reduced LHL-choleste and CRP.
Biological effects: cardiovascular health, obesity, metabolic health, type 2 diabetes, cancer, bone health, cognitive function, vision
1242
B0433
Phytosterols
2004
Campesterol
Human
2 g/d
8 weeks
Sterol OJ: Decreased concentrations of: -total (7.2%) and LDL (12.4%) cholesterol (P<0.001) - non-HDL cholesterol (7.8%) (P<0.01). -Apolipoprotein B (9.5%
P<0.01). No effect on

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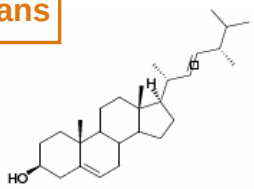
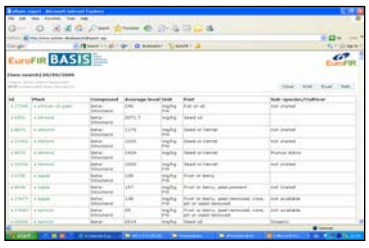


Current status

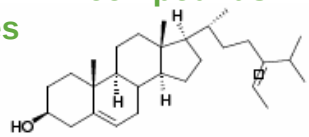
Composition: 436 papers
Bio-effects: 435 papers

Composition: 16684 data points
Bio-effects: 766 data points



Composition: 188 plants
Bio-effects: 70 plants

Composition: 254 compounds
Bio-effects: 144 compounds
- 16 classes



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Future Plans

- **Possible inclusion of:**
  - **Tocopherols**
  - **Chalcones**
  - **Dihydrochalcones**
  - **Curcuminoids**
  - **Phenolic acids (simple)**
  - **Xanthine alkaloids**

- **Non-plant bioactive peptides**
  - **e.g. from dairy, meat, fish**

Conclusions

- **EuroFIR BASIS is…**
  - A unique **online** database
  - Containing **compositional and biological data** for major food bioactive compounds
  - Containing **additional information** e.g. plant, compound class, links
  - Data is **easily extractable** and manipulated by users
  - Useful to a **range of users** (e.g. industry, policy makers, researchers)

Acknowledgements

EuroFIR BASIS Management team

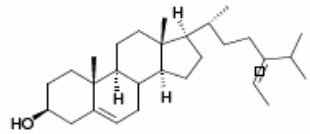
Composition: Paul Kroon & Jenny Plumb (IFR, UK)
Bio-effects : Mairead Kiely, Darina Sheehan & Lucinda Black (UCC, Ireland)
Plant list: Jorn Gry, Kirsten Pilegaard & Folmer Eriksen (DTU, Denmark)

Composition evaluators
Anna-Maija Lampi, Sonja Thanner-Lechner, Maria Ranic, Lourdes Samaniego, Mauricio Rostagno

Bio-effects evaluators
Maria Kapsokefalou, Peter Hollman, John Christian Larsen, Gerrit Speijers

Quality teamImplementing I.T.
Isabel Castanheira, Mark Roe Eric Norby

This work was prepared on behalf of the EuroFIR consortium and funded under the EU 6th Framework Food Quality and Safety Programme (Project Contract No: FOOD-CT-2005-513944).



Thank you

Further information: www.eurofir.net

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