



FEEDING FATS SAFETY One-Year Meeting 9-10 February 2006 – Barcelona

WP-1: Characterization and classification of feeding fats
(preliminary results)

CHEMICAL COMPOSITION


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Fat Materials Studied

1. Acid oils from chemical refining (AOCHÉ)
2. Acid oils from physical refining (AOPHY)
3. Lecithins (LECI)
4. Recycled cooking oils (RECY)
5. Animal fats (ANFA)
6. Oils from exhausted bleaching earths (EBE)
7. Fish oils (FISH)
8. Hydrogenated fats from by/co-products (HYBY)
9. Fatty acids calcium soaps (FACS)
10. Miscellaneous (MIX)

Analytical parameters



Acid Value
Mono- and diacylglycerols
Fatty acid composition
Sterol composition
Tocopherols/Tocotrienols



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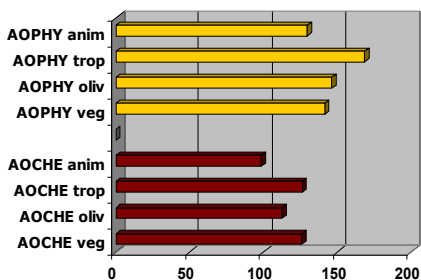


Acids oils from chemical refining (AOCHE)

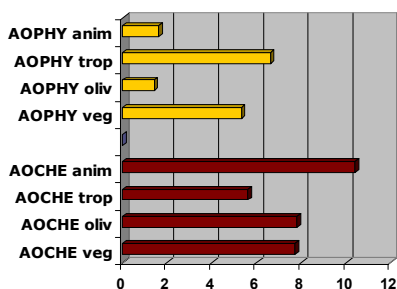
Acids oils from physical refining (AOPHY)

Acid Value & MG+DG

ACID VALUE (mg KOH/g)



MG+DG (%)



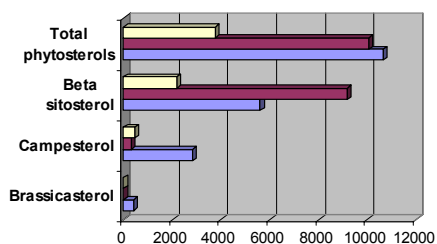
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Acids oils from chemical refining

Acids oils from physical refining

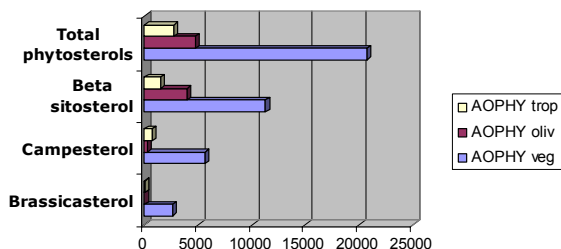
Phytosterols



Legend: AOCHE trop (yellow), AOCHE oliv (red), AOCHE veg (blue)

AOCHE

AOPHY



Legend: AOPHY trop (yellow), AOPHY oliv (red), AOPHY veg (blue)



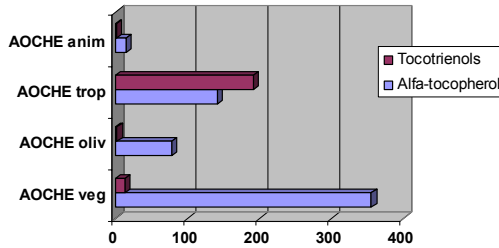
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Acids oils from chemical refining

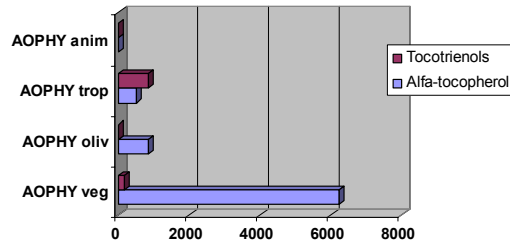
Acids oils from physical refining

Tocopherols & Tocotrienols



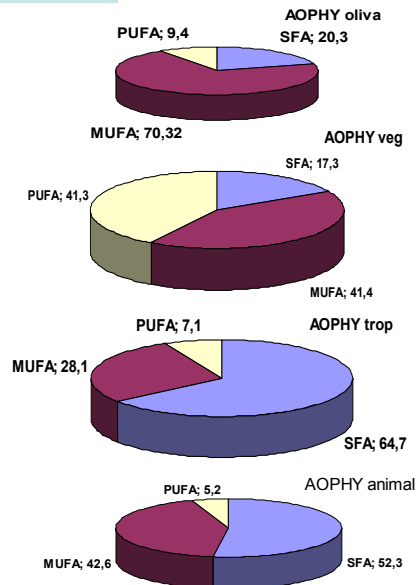
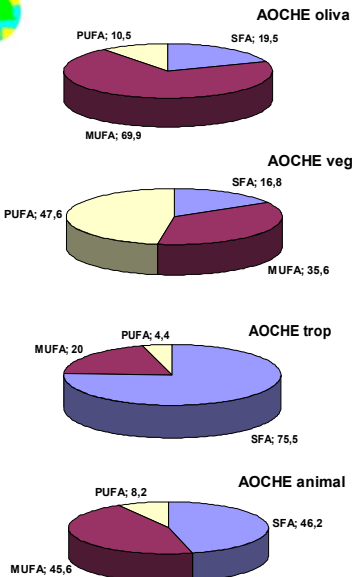
AOCHE

AOPHY



Fatty acid composition

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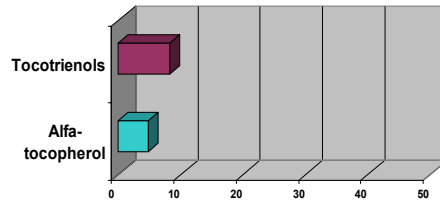
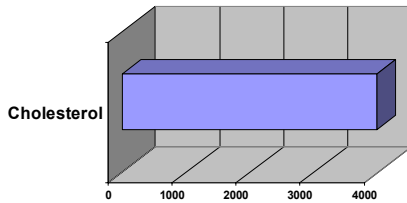
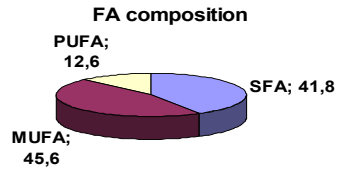
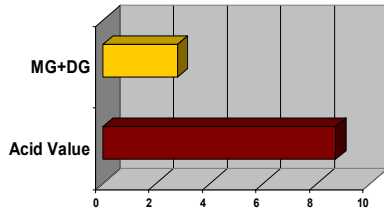
✓ A high variability was observed in vegetable fats, according to their varied origins



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Animal fats



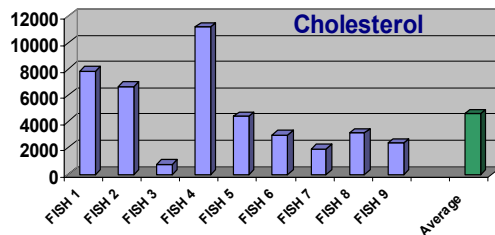
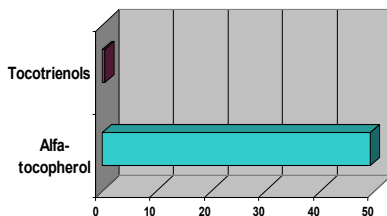
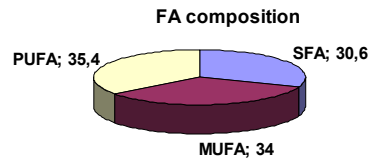
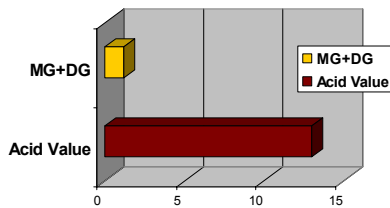
✓ A high variability was observed for cholesterol content and fatty acid composition



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Fish oils



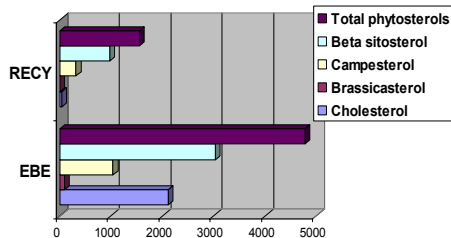
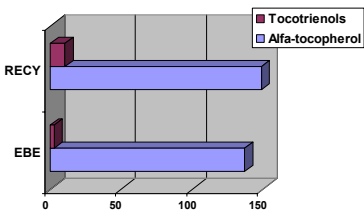
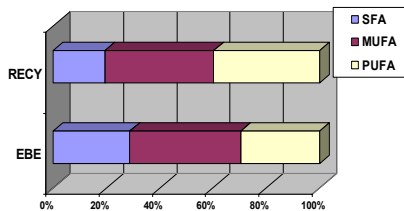
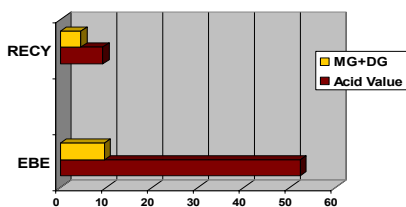


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Recycled cooking oils (RECY)

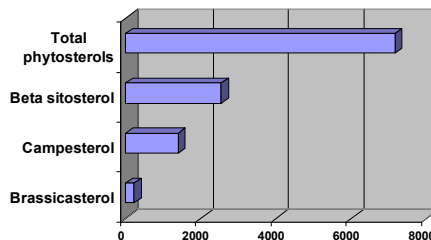
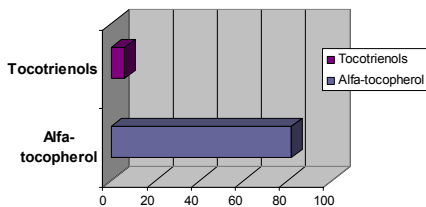
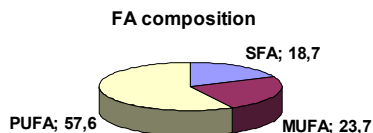
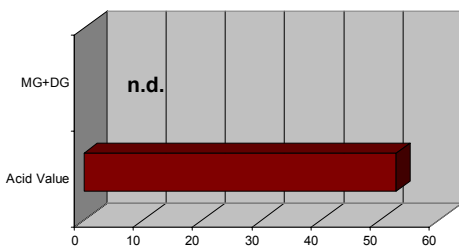
Oils from exhausted bleaching earths (EBE)



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Lecithins



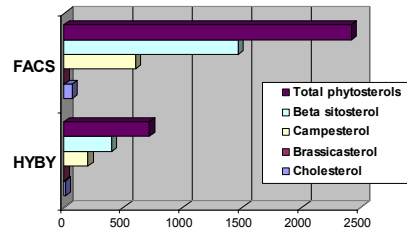
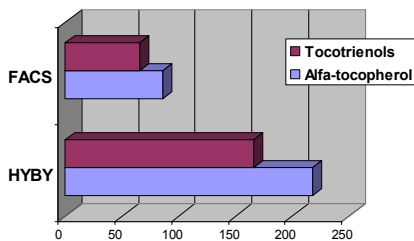
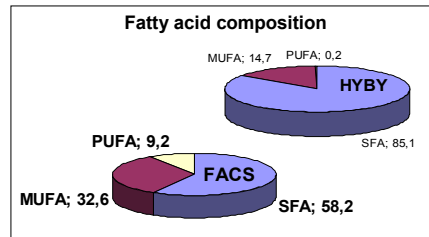
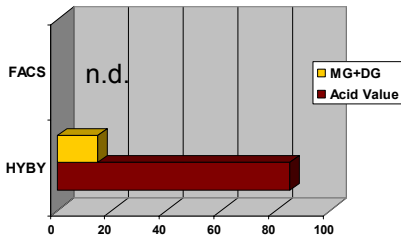


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Hydrogenated by-products (HYBY)

Fatty acid calcium soaps (FACS)



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Conclusions-1

AOCHEs & AOPHYs

- Characterized by a very high acid values, but differences can be established since AOPHYs show \uparrow AV and \downarrow MG+DG
- Sterol content is $\uparrow\uparrow$ for AOCHEs, but that of tocopherols and tocotrienols is $\downarrow\downarrow\downarrow$

LECITHINS

- High Acid values (average 50 mg KOH/g)
- Very high % Polyunsaturated FA
- Very high levels of sterols, but intermediate values of tocopherols and tocotrienols



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Conclusions-2

ANFAs

- Very low values of Acidity and MG+DG
- FA composition depends on the animal species
- High variability in Cholesterol content, maybe dependent more on tissues used than on animal species
- Very low levels of tocopherols and tocotrienols

FISH OILS

- Very low values of Acidity and MG+DG, although higher than ANFAs
- FA composition typical of fish oils, but with high variability, particularly in % n-3 PUFA
- Cholesterol levels similar to those of ANFAs, with high variability
- Low levels of tocopherols and NO tocotrienols



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Conclusions-3

RECYCLED COOKING OILS and EBEs

- EBEs are characterised by a quite high Acidity and % MG+DG values, while RECY show very low values
- In both cases, FA profile is not characteristic
- EBEs show much higher sterol content than RECY, but there are no differences for tocopherol and tocotrienol contents

FA CALCIUM SOAPS and HYDROGENATED PRODUCTS

- Characterised by high % SFA, although HYBY > FACS
- HYBY show quite high Acide Values (Palm Fatty Acid Distillates is usually the prime matter)
- FACS are much more rich in sterols, but much less rich in Tocopherols/tocotrienols