

# Omega-6 to Omega-3 ratios in margarine 'significant'

Dr Carl Albrecht, Head of Research

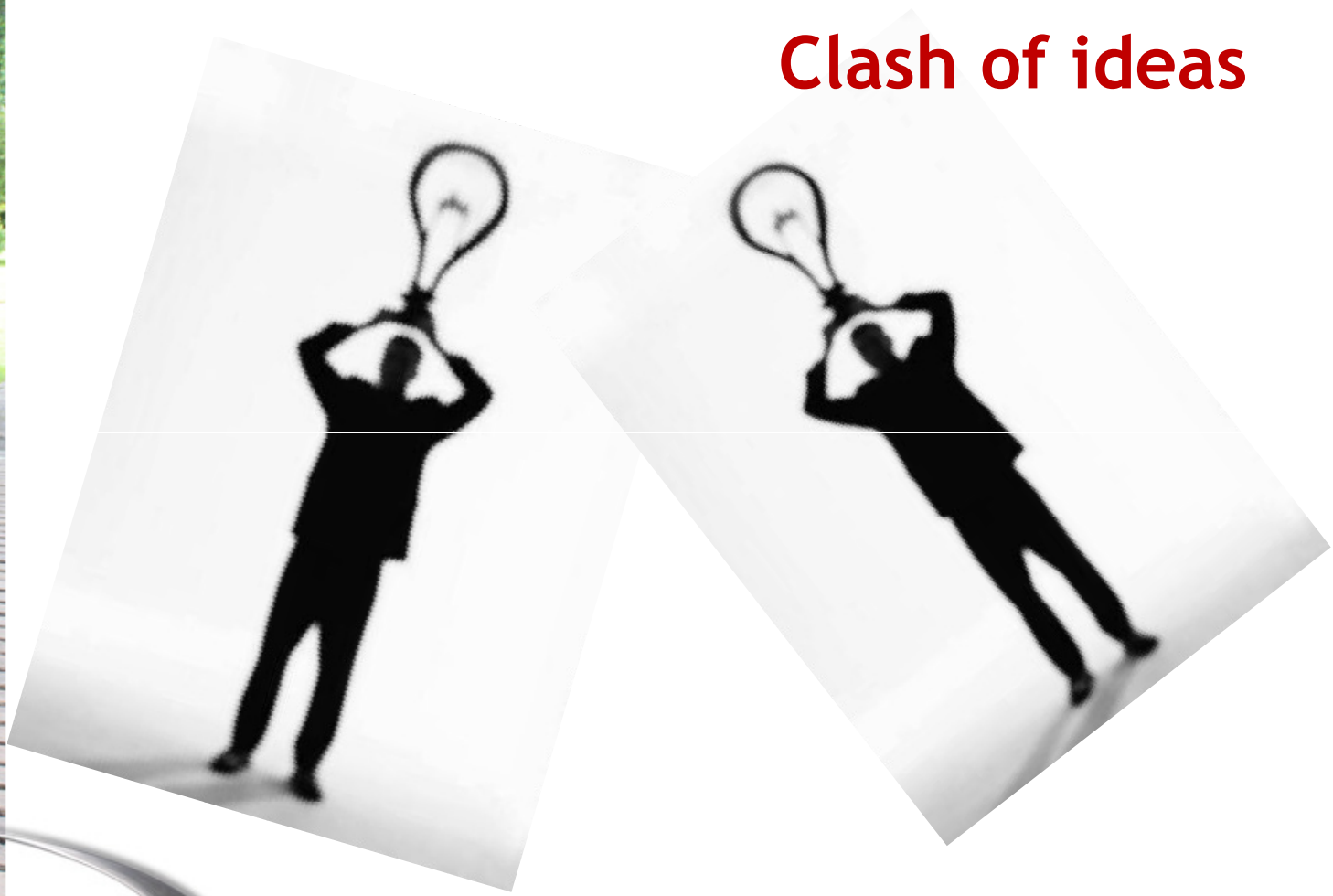


Research • Educate • Support

*Cancer affects us all...*

What is this all about?

**Clash of ideas**



*Cancer affects us all...*

# What are the opposing ideas?

## Pro ratio

- The ratio of n-6/n-3 is significant for health and disease and is based on solid science

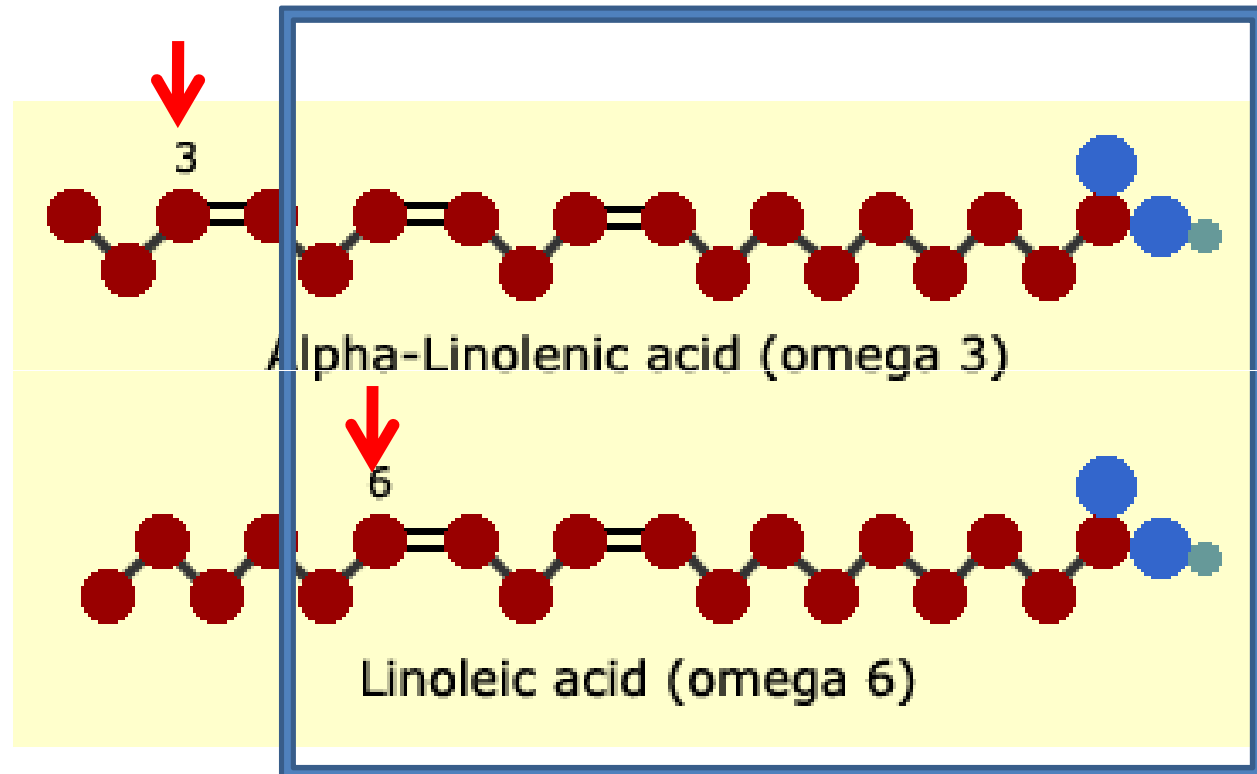
## Anti-ratio

- The ratio of n-6/n-3 is not based on good science, has conceptual limitations and no compelling rationale for recommendation of a specific ratio.



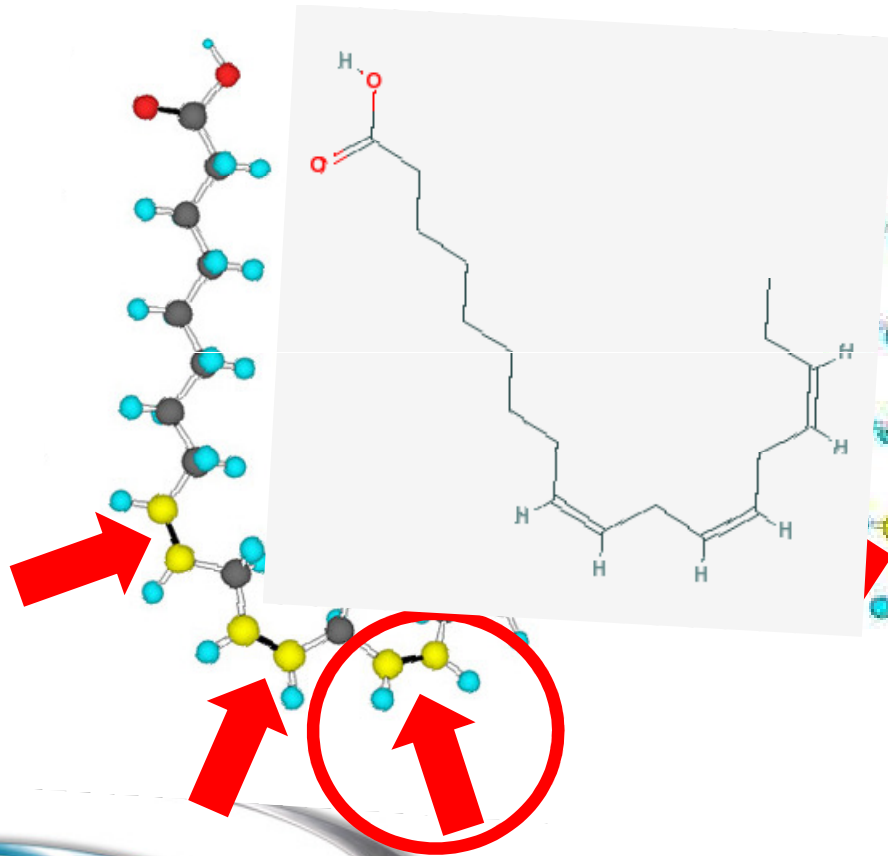
*Cancer affects us all...*

# What are omega-3 and omega-6?

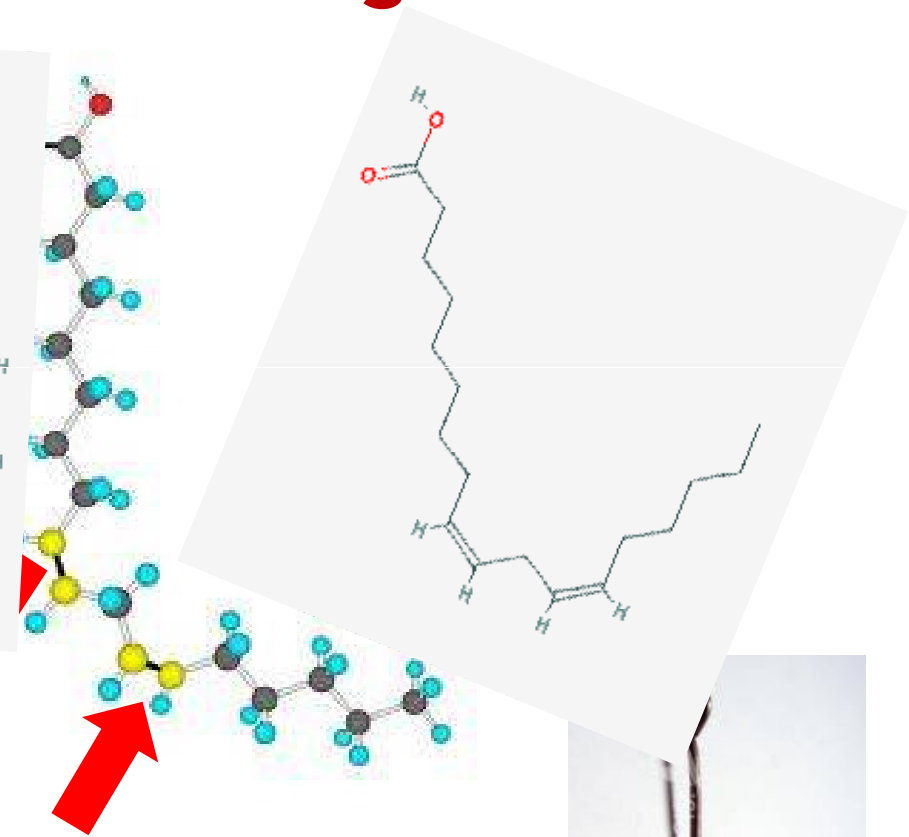


# Extremely subtle differences

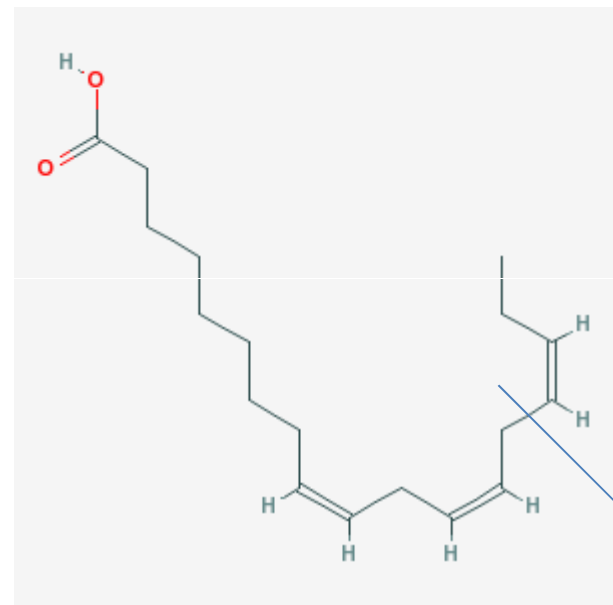
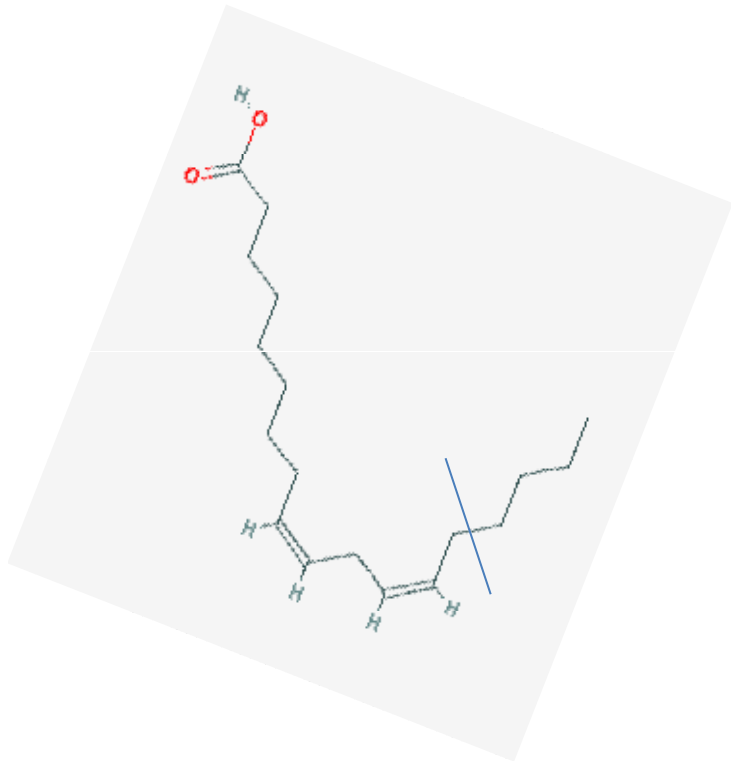
## Omega-3



## Omega-6



*Cancer affects us all...*



*Cancer affects us all...*



## Why have a ratio?

- **Example:**
- $n-6/n-3 = 5:1$
- Because this ratio is telling us something very fundamental about the PUFA composition of a food or other biological matrix.
- It is telling us about the quantitative aspects of two very different families of PUFA.

# Examples of n-6/n-3 ratios

<b>Aspect</b>	<b>N-6/n-3 ratio</b>
• Paleolithic diet 40 000 y.a.	• 0.70
• Modern Western diet	• 18.75
• Greece prior to 1960	• 1.00 – 2.00
• US today	• 16.74
• Sunflower oil	• 70
• Canola oil	• 1.9
• Blossom Canola Margarine	• 2.21
• Greek egg	• 1.3
• Supermarket egg	• 19.9
• Fishmeal egg	• 6.6
• Flax egg	• 1.3



*Cancer affects us all...*



# Medical implications of low ratios

## Ratio

- High n-6
- High n-3
- N-6/n-3=5
- N-6/n-3=10
- N-6/n-3=4/1
- 2-3/1
- 4-6/1
- 5/1
- Higher n-3
- <4.5/1
- Ratio

## Implication

- Higher incidence of breast cancer in Israel
- Hyperinsulinemia, atherosclerosis, tumorigenesis
- Lower risk of breast cancer, colon cancer
- Beneficial re asthma
- Adverse for asthma
- 70% decrease in mortality
- Suppressed inflammation rheumatoid arthritis
- Maximal conversion of short to long n-3
- Optimal mixture for countering deficiency
- Decrease proinflammatory cytokines
- 95% lower risk heart disease
- Predictor of low-grade inflammation

**How can all of this lack scientific rationale?**



*Cancer affects us all...*



## Significant quote

- **“Currently , the Western diet contains a disproportionately high amount of n-6 PUFAs and low amount of n-3 PUFAS, and the resulting high n-6/n-3 ratio is thought to contribute to cardiovascular disease, inflammation, and cancer”.**
- IM Berquin et al., Department of Cancer Biology, Wake Forest University School of Medicine, Winston-Salem, NC, US. *Cancer Lett.* 2008, 269, 363-377.

## Quote from “Margarine Myths debunked”

- “The WHO also concluded that : Based on both the scientific evidence and conceptual limitations, there is no compelling scientific rationale for the recommendation of a specific ratio of omega-6 to omega-3 fatty acids”
- Reasonable conclusion:
- **The n-6/n-3 ratio is not scientific**



*Cancer affects us all...*

## The full WHO statement

- ““The WHO also concluded that “Based on both the scientific evidence and conceptual limitations, there is no compelling scientific rationale for the recommendation of a specific ratio of omega-6 to omega-3 fatty acids, especially if intakes of n-6 and n-3 fats lie within the recommendations in this report”



*Cancer affects us all...*

## What are the recommendations?

- “The minimum intake levels for essential fatty acids to prevent deficiency symptoms are estimated at a convincing level to be 2.5%E LA plus 0.5%E ALA”.
- Another way of putting this is that the n-6/n-3 ratio of E% =  $2.5/0.5 = 5/1$
- Conclusion:
- The n-6/n-3 ratio is fundamentally significant and cannot be avoided even by fiat. It is dictated by biochemical imperative.
- (Fiat – an arbitrary order or decree)



*Cancer affects us all...*

## N-6/n-3 ratio is significant

- **Rationale:**
- Increased ratio in biological tissue indicates imbalance.
- Imbalanced ratio linked to serious degenerative diseases.
- Ratio can act as a predictor of early disease, e.g. inflammation
- Decreased ratio indicates health (prevention and healing).
- Ratio can indicate need for improvement
- Ratio can indicate biochemistry of deficiency, e.g. 5:1
- Ratio is an efficient communication concept.



*Cancer affects us all...*

## Conclusion

- We have corresponded with various lipid chemists at home and abroad and all are astounded by the FAO/WHO recommendation and think that it is incorrect.
- We have appealed to the WHO Committee to reconsider the recommendation and we are willing to make a formal submission.
- Our own studies of peer-reviewed literature convince us that the n-6/n-3 ratio is significant and that the recognition of the low ratio in canola oil and canola-based margarine can help to reduce the risk of cancer and therefore these products are worthy of recognition with the CANSA “Smart Choice” emblem.





*Research • Educate • Support*

*Cancer affects us all...*

**Thank You**