

POTS
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Changing Marketing Landscape - Challenges for Business Sustainability

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**A MARRIAGE BETWEEN PALM AND SOFT OILS -
THE PATH IN REDUCING TRANS FATS IN THE US
FAST FOOD AND CATERING INDUSTRIES**

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SESSION 3

MARKET FUNDAMENTALS & PRICE OUTLOOK

A Marriage Between Palm and Soft Oils - The Path in Reducing Trans Fats in the US Fast Food and Catering Industries

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Abstract

The adverse health effects of dietary trans monounsaturated fatty acids (tFA), resulting from the partial hydrogenation of liquid vegetable oils, has been the subject of intense scrutiny. In the United States, starting in 2006, Nutrition Facts Panels started to display the tFA content. Subsequent to this, intense lobbying at the state and local levels resulted in New York city and Boston imposing bans on tFA in restaurants. In July 2008, California became the first state – to legislate a complete ban on tFA (from 2010 in restaurant products and all retail baked goods by 2011). Other states can be anticipated to follow this trend in the coming months. Hence replacement of tFA in the food supply is now of primary importance to manufacturers and retailers, due to the unprecedented awareness of the general public in relation to this issue. Thus replacements for tFA have to be readily available, affordable, possess the desired functionality and be healthier. An ideal opportunity exists for palm oil to fill the niche created by the gradual removal of tFA. As has been shown repeatedly for almost two decades, blends of palm oil with soya, canola and corn allow for complete elimination of tFA without compromising cost, functionality or health. Theoretical calculations reveal that all tFA in the US food supply can be replaced with an equimix of palm and soya oils. As far as the palm oil industry is concerned, the mere fact that palm oil is trans free – can no longer be used as its sole “selling” point. Palm oil now has to compete with new oils (produced by interesterification or genetic modification) that are becoming available in the market place – and all of these are trans free. This paper will highlight the current and future trends on the usage of palm oil in the US fast food and catering sector arising from the new trans fat regulations.

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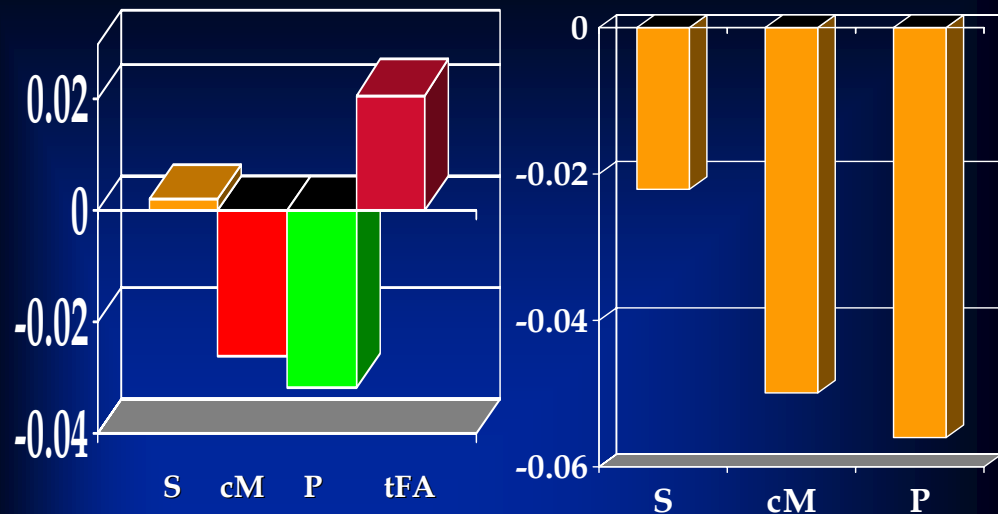
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E-Mail Address:

aa0987@wayne.edu
↓
(Zero)

1

Effects on the TC/HDL-C ratio



CHO → FA

tFA → FA

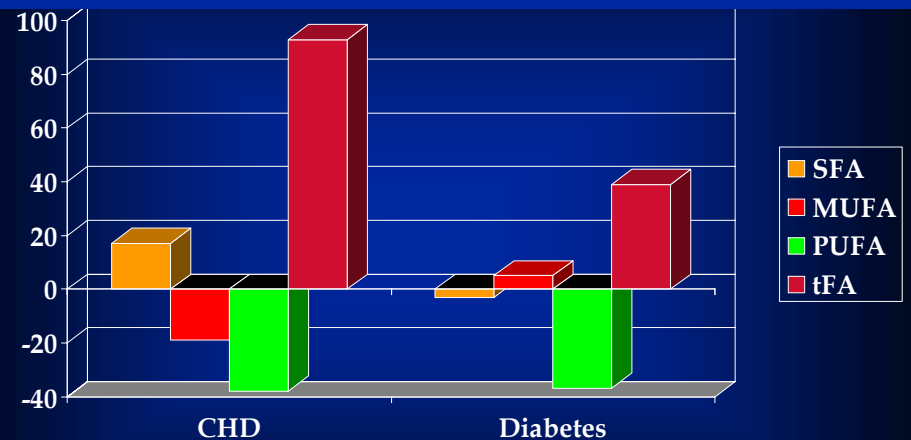
Am J Clin Nutr (2003) 77: 1146-1155

N Engl J Med (2006) 344: 1601-1613

2

Dietary Fat intake and Risk of CHD and Type II Diabetes (TIID) in Women

Effects of replacing 2%en from carbohydrates with trans fatty acids



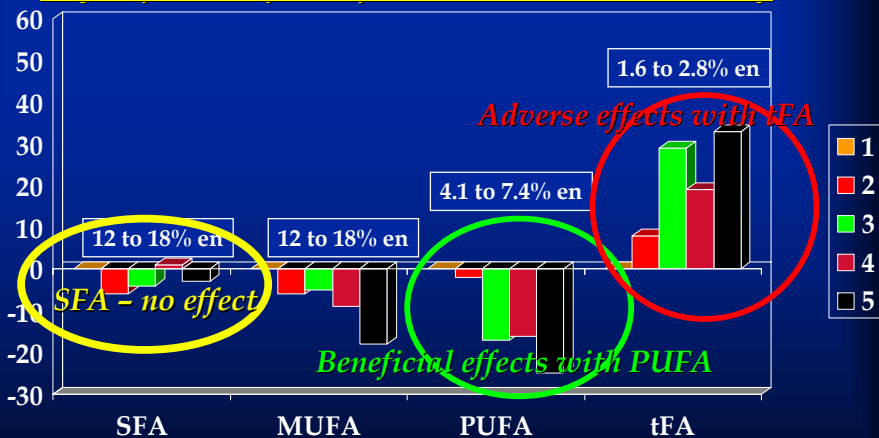
Effects of replacing 5%en from carbohydrates with specific fatty acids

CHD data - Hu et al, (1997) N Engl J Med, 337: 1491-1499

Type II Diabetes data - Salmeron et al, (2001) Am J Clin Nutr 73: 1019-1026

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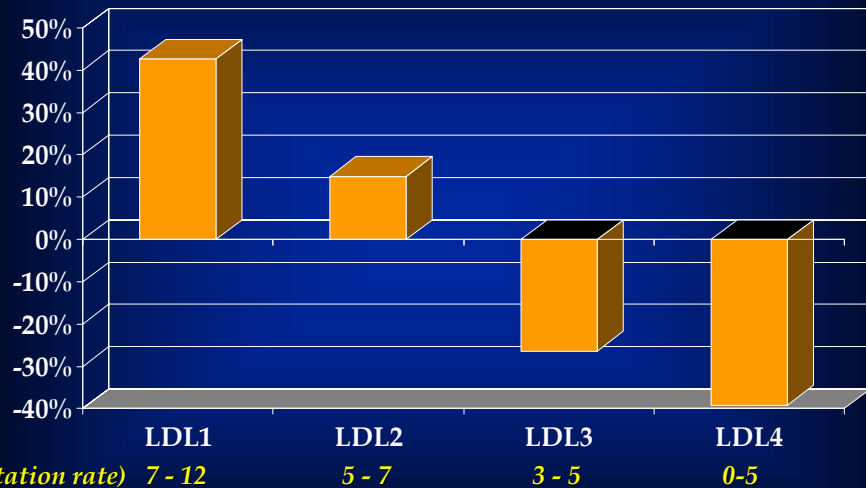
Relative risk of CHD based on quintiles of dietary fatty acid intake (Multivariate analyses)
20 year follow-up data from the Nurses Health Study



from Oh et al (2005) Am J Epidemiol, 161: 672-679

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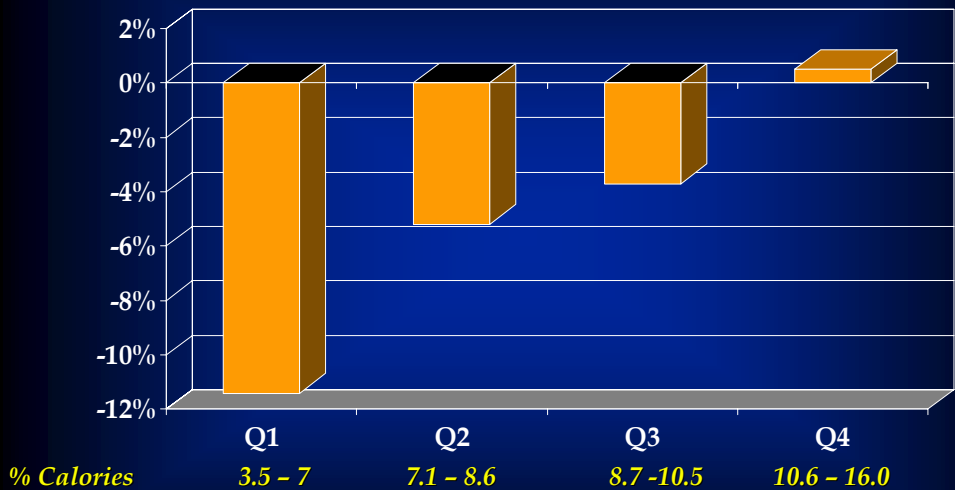
Changes in LDL subfraction mass. Low → high fat diets (24% cal → 45% cal: SFA 6% cal → 18% cal)



Dreon et al (1984) Am J Clin Nutr, 67: 828-836

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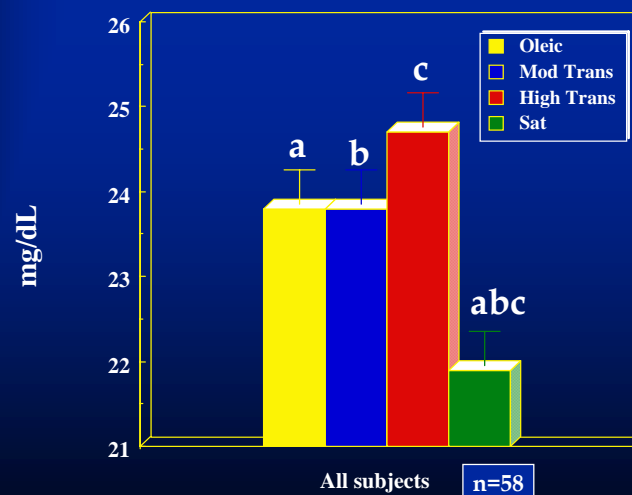
Saturated fat intake and Changes in mean minimal Coronary Arterial Diameter in post-menopausal women



Mozaffarian et al, (2004) Am J Clin Nutr, 80: 1175-1184-1499

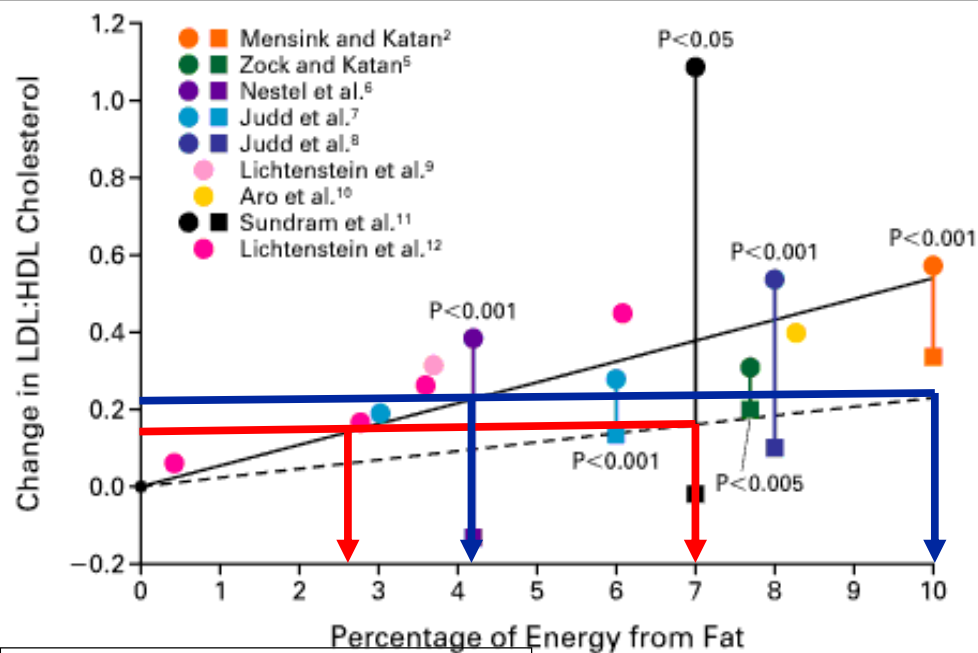
6

SFA lower Lp(a) concentrations?



Clevidence et al, 1997

7



Ascherio et al, (1999 N Engl J Med 340: 1994-1998)

8

- Since trans are **twice** as potent as SFA – an **equal** replacement of trans with SFA (e.g. 1 g with 1 g) will **improve** lipids and decrease risk
- .. further **improvement** with unsaturated oils

	7	4 - 6	20 - 30	60 - 70	<1
Sunflower	5	4 - 5	80 - 90	5 - 9	<1
	4-5	4 - 5	55 - 75	15 - 35	<1
	11	4	23	54	8
Soybean	10 - 15	5 - 6	32 - 41	41 - 45	2
	25	4	16	44	10
	9	26	18	39	8
Canola	8	3	84	3	1
	4	3	25	58	8
	4	2	62	22	10
	4	2	89	2	3
	Palmitic	Stearic	Oleic	Linoleic	Linolenic

9

- Since trans are **twice** as potent as SFA – an **equal** replacement of trans with SFA (e.g. 1 g with 1 g) will **improve** lipids and decrease risk
- .. further **improvement** with unsaturated oils
- **Conservative Recommendation:** Eliminate trans but ensure that the total SFA + trans content of original formulation is not exceeded by total SFA in new formulation
- Original 3 g SFA + 2g trans. New <5 g SFA
- Replacing trans with SFA will improve the scenario
- Palm oil can be a suitable choice in such situations
- How much Palm oil?

10

conservative -- based on current recommendations for restricting SFA

--can calculate the amount of palm oil in a prudent diet that satisfies various dietary guidelines

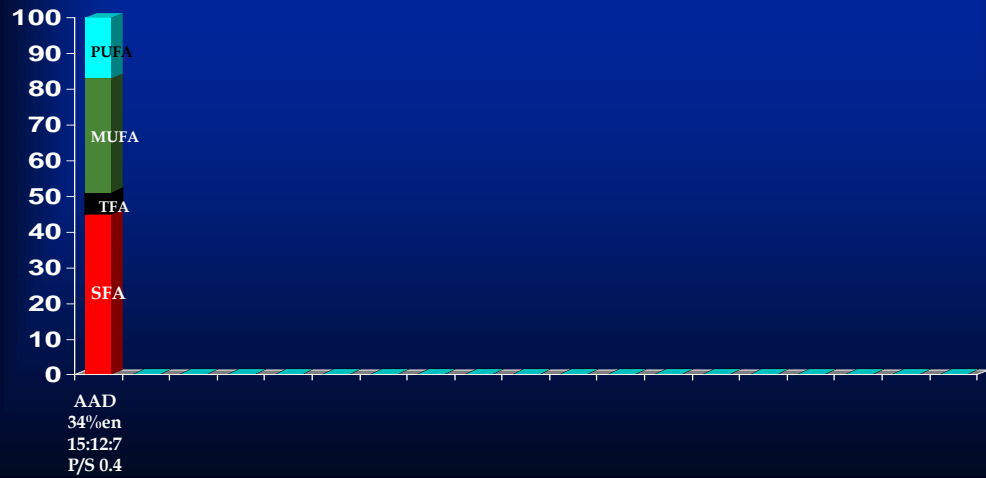
% calories from SFA	% calories from total fat				
	20	25	30	35	40
5	54	43	36	31	27
6	65	52	43	37	32
7	76	61	51	43	38
8	87	69	58	49	43
9	97	78	65	56	49
10	100**	87	72	62	54

Khosla (2006) J Agro Food Ind. 17: 21-23

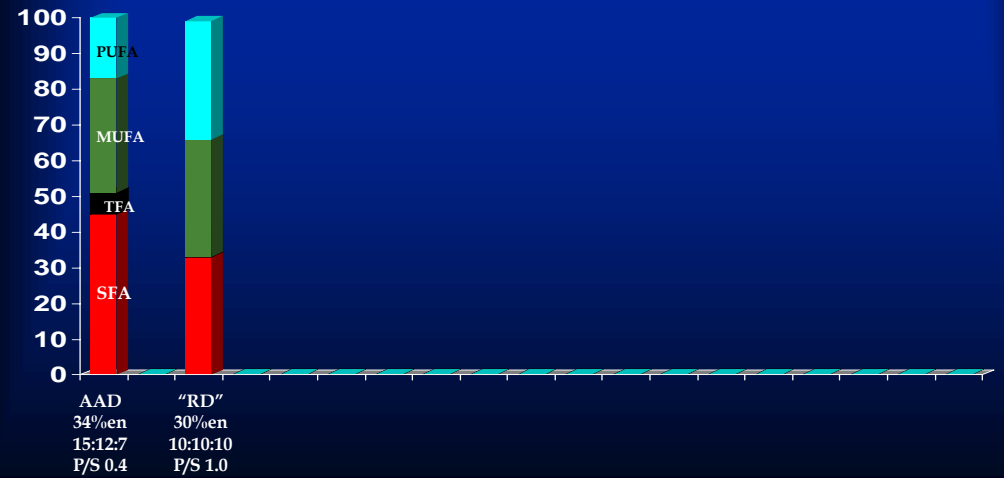
Hayes and Khosla, Eur J Lipid Sci Tech (2007) 109: 453-464

11

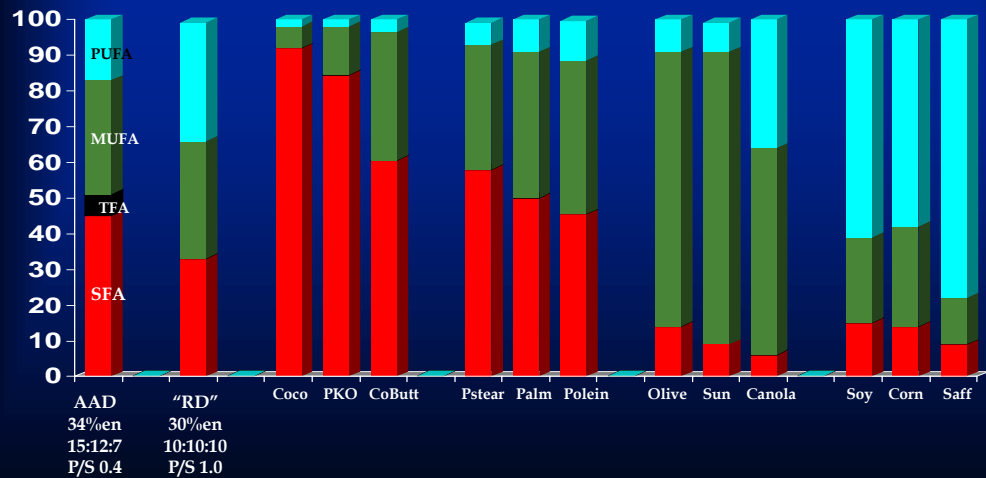
Dietary fat composition: by fatty acid classes



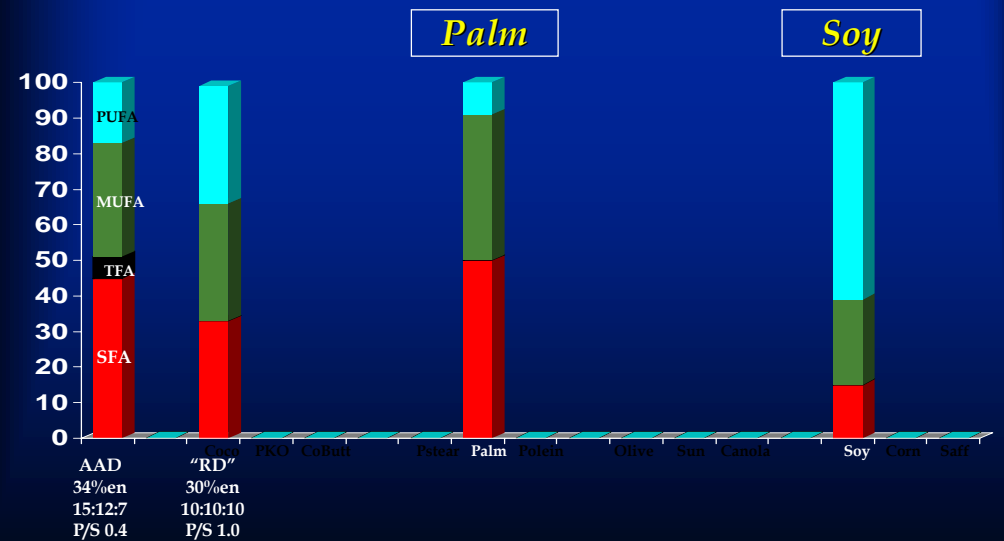
Dietary fat composition: by fatty acid classes



Dietary fat composition: by fatty acid classes

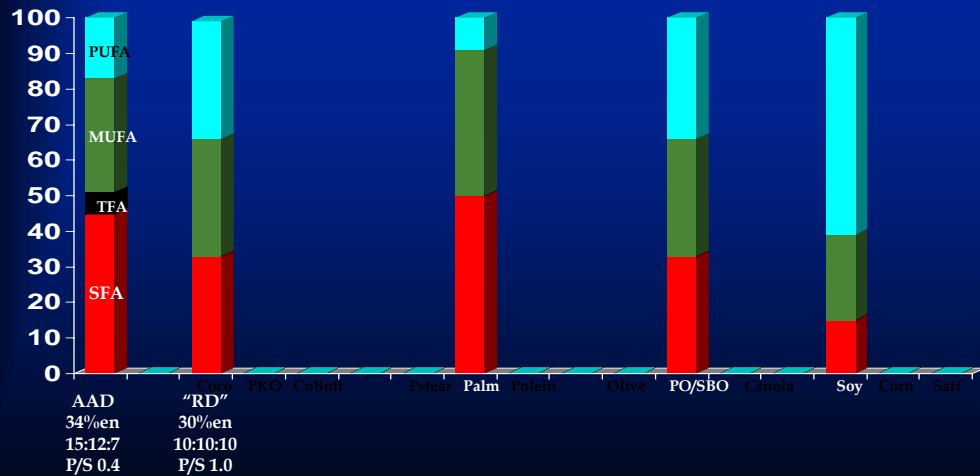


Dietary fat composition: by fatty acid classes

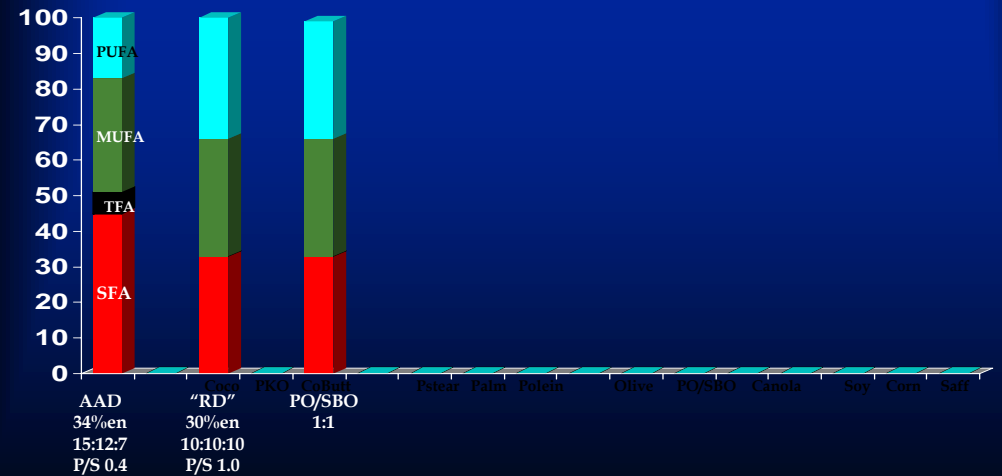


Dietary fat composition: by fatty acid classes

Palm/Soy 1:1 mix



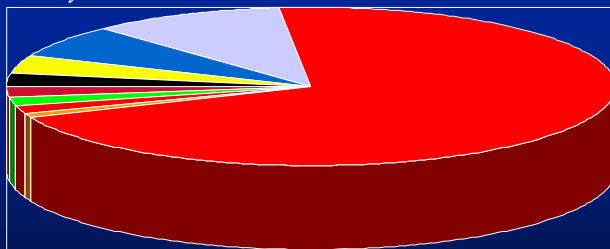
Dietary fat composition: by fatty acid classes



Lets look at a theoretical model

Oil consumption in US
Total: ~25 billion lbs

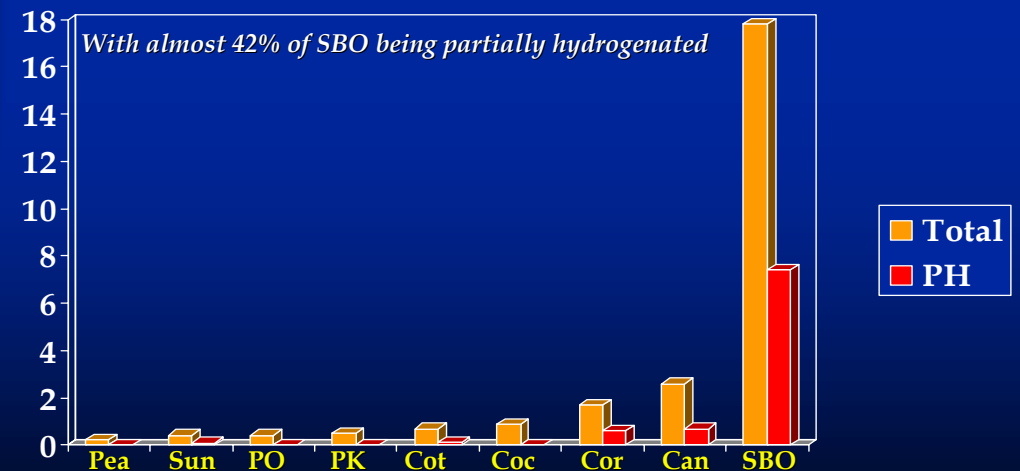
SBO accounted for 70% of edible oil consumption in the US in 2005 while Palm Oil accounted for 1.7% (PO + PKO = 3.8%; PO + PKO + CocO = 7.3%)



Pea Sun PO PK Cot Coc Cor Can SBO

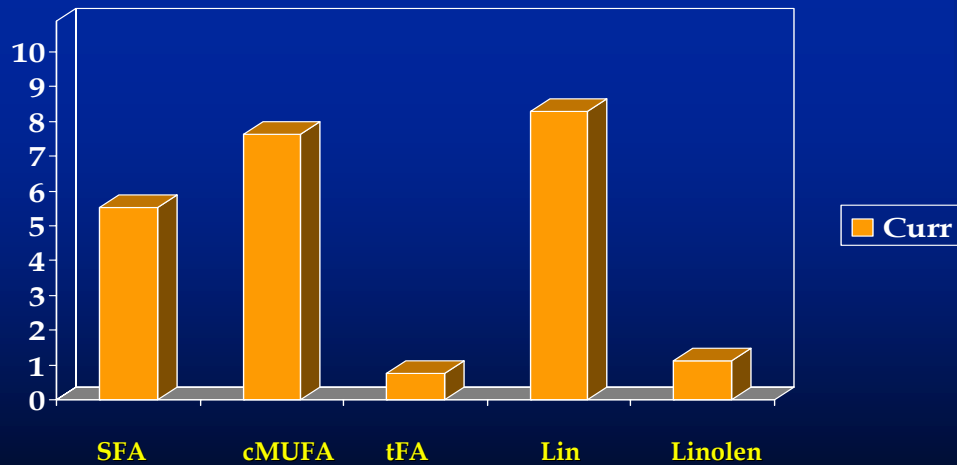
Circulation, (2007), 115, 2220-2235

Out of the ~25 billion lbs consumed, 9 billion lbs was partially hydrogenated (36%)



Circulation, (2007), 115, 2220-2235

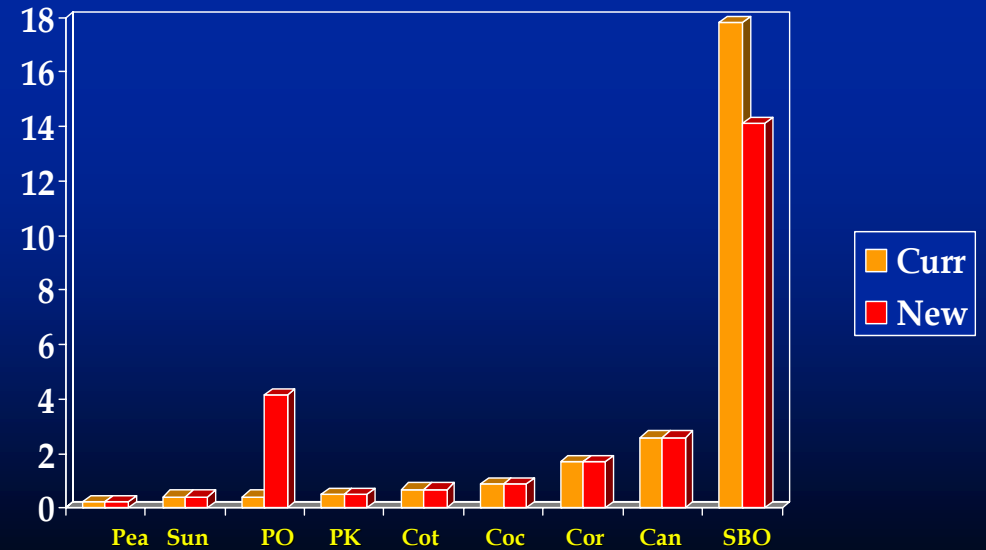
Based on fatty acid composition of individual oils can calculate US fatty Acid consumption..... (Total: ~25 billion lbs)



Circulation, (2007), 115, 2220-2235. Am. J. Clin. Nutr. (2006), 84, 497-504. Nutr. & Metab. (2007) 4, 3.

16

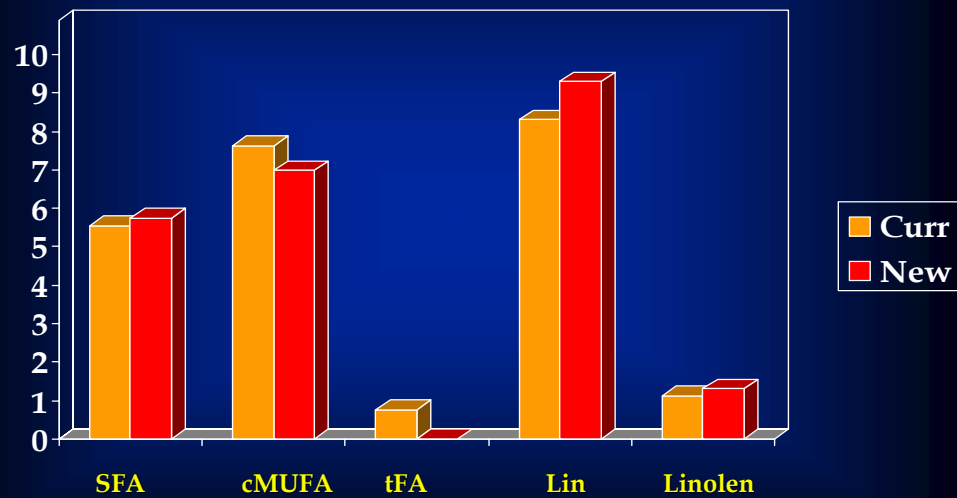
However by replacing PHSBO with an "equimix" of unhydrogenated SBO and Palm oil (billions of lbs)



..which would free up ~3.7 billion lbs of SBO for other uses !

17

...trans Fatty acids can be eliminated... without impacting the P/S ratio ... (data in billions of lbs)



P/S ratio: Current 1.70 New 1.85

18

• Palm Oil/Soybean Oil mix

- Elimination of trans
- SFA decreased by 25%
- MUFA unchanged
- 18:2 increased by 2.1 fold
- P/S increased 2.7 fold
- 18:3 has increased 2.6 fold
- 18:2/18:3 ratio has gone from 10:1 to ~8:1

19

How would this affect CHD risk?

Has been calculated that based on

- 1) Changes in plasma lipoproteins, replacing 2% calories from trans FA with saturated fatty acids... would decrease risk by 4%
- 2) Changes in additional parameters for CHD, besides lipoproteins, replacing 2% calories from trans FA with saturated fatty acids... would decrease risk by 17%

[Mozaffarian and Willett, \(2007\) Curr. Ather. Rep., 9: 486-493.](#)

20

So what sort of products could take advantage of this palm/soy (soft oils) "marriage"?

Trans Fat Help Center

www.notransfatnyc.org

Margarines Spreads - 0 grams trans fat

- Promise
- Gold-N-Sweet Zero Trans Whipped Spread
- Smart Balance 67% Buttery Spread
- Smart Balance Omega Plus Butter Spread
- Gold-N-Sweet Zero Trans Whipped Margarine
- Sunglow Zero Trans European Style Whipped Butter Blend
- Gold'n Flavor Table Grade Margarine
- Old World Table Grade Zero Trans Margarine
- Aurora Trans Free Butter Blend
- Aurora Table Grade Margarine
- Admiration 0 Grams Trans Fat Margarine
- Ventura Table Grade Margarine - Natural
- Ventura Table Grade Margarine - Natural Non-Dairy
- Plus 7 others

Baking Shortening, Baking Margarines and Doughnut Fry Oils - 0 grams trans fat

All purpose baking shortening

- Majestic NH 20 Plus
- Transadvantage P-100 NH Palm Shortening
- Sanstrans RS 39 T20
- BBS Z
- Elite Vream NH
- Primex Z
- Sanstrans 39
- Sanstrans 39 T15
- Richtex P-ZT
- Ventura All Purpose Palm Oil Shortening

Butter, Butterblend and Bakers Margarine

- Buckeye Z
- Gold'n Flavor Palm/Soy Table Grade Margarine W
- Old World Zero Trans Table Grade Margarine
- Coral NH White Margarine
- Gold'n Flavor Baker's Margarine (Palm/Soy)
- Smart Balance Butter Blend
- Ventura Cookie Dough Margarine (GMO free)
- Old World Zero Trans Bakers Margarine
- Victor NH Margarine
- BBS Z
- Bunge Donut Fry NT

Doughnut Fry Shortening

- Primex Z
- BBS Z
- Bunge Donut Fry NT
- Sans Trans Donut Fry P

Cake and Icing Shortening

- Cremol NH Icing Shortening
- Sweetex Z
- Alpine Z
- Hymo Z Emulsified Cake and Icing Shortening

Roll-in/Flake Shortening (Puff Pastry/Danish/Biscuit)

- Bunge NH Hi Ratio Roll In
- Bunge Biscuit Flake NH
- Golden Brands LP415NT Zero Trans Shortening Flake
- Golden Brands LP480NT Zero Trans Shortening Flakes

Roll-in/Flake Margarine (Puff Pastry/Danish/Croissant)

- Ventura NTF Puff Pastry Margarine
- Bunge Croissant NH Roll-in Margarine
- Ventura Pastry Margarine
- ZT Puff Pastry Margarine (Con Agra)

Fry Oils and Shortenings - 0 grams trans fat

- Fry Chef
- SansTrans Fry HD-50
- Old World Trans Free Liquid Margarine
- Palm Oil

Summary

- Can eliminate trans FA
- Several options – e.g. GM oil seeds
- Replacement possible using Palm Oil
- Essentially maintain SFA levels
- P/S ratio not affected
- Even if trans FA replaced exclusively with SFA, CHD risk improved
- Vast array of products using palm oil blended with other oils already in the US
- In 2007, palm oil imports into US ~ 500, 000 tonnes
- From Jan – Jun 2008, already ~ 750, 000 tonnes