

HEALTHY OILS

Balancing Form & Function



Global Oils & Fats Business Forum
San Diego, CA 2005

What do we mean by healthy fats anyways ?

- *Trans* free ?
- Low sats ?
- Cholesterol free ?
- CLA / mono / ω -3 PUFA ?



Is a healthy fat available for every application ?

- Confectionery ?
- Bakery ?
- Frying ?

An Early View of Healthy Fats

Fat Provides

- Energy
- Cell structural components
- Essential fatty acids (18:2, 18:3)
- Carrier for fat soluble vitamins

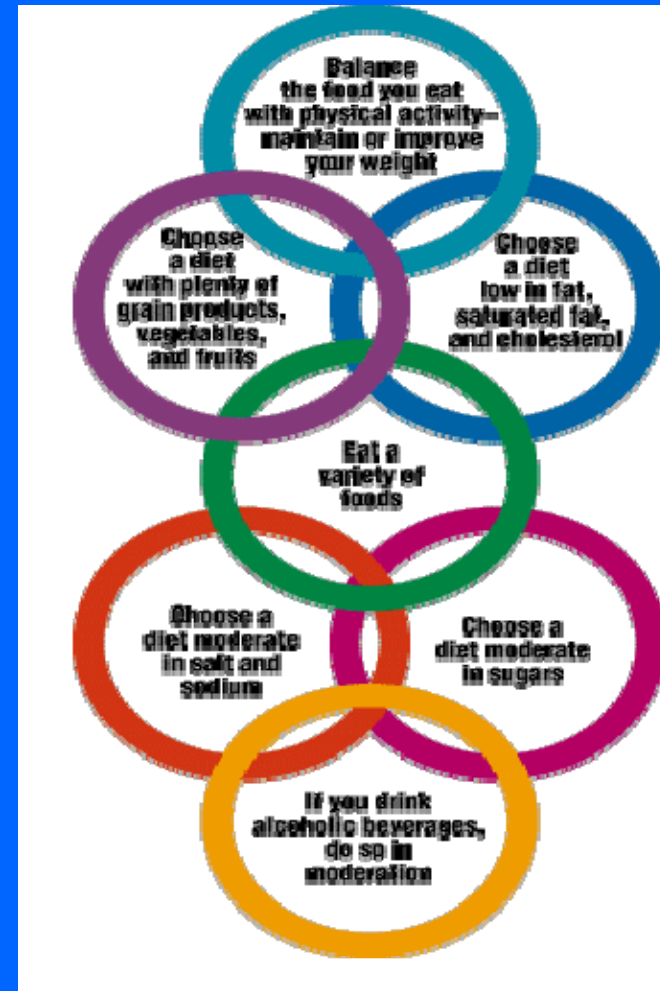


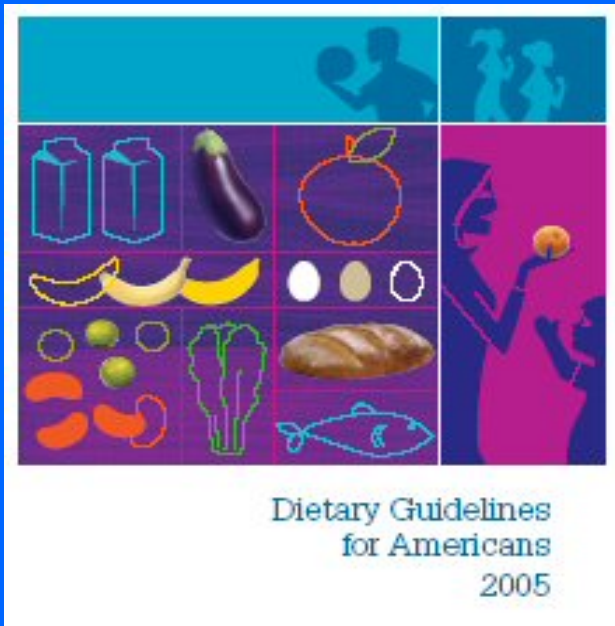
Dietary Guidelines for Americans

1985



1995





2005

Consume < 10% of calories from **saturated** fat.

Keep **trans** fat consumption as low as possible.

Keep total fat intake between 25-35% of calories with most fats coming from sources of **monounsaturated** and **polyunsaturated** fatty acids.

MyPyramid



Make most of your fat sources from fish, nuts and veg oils.

Limit solid fats like butter, stick margarine, shortening and lard.

Keep saturated fats and *trans* fats low.



Good Fats:

Lower the risk for certain diseases



Bad Fats:

Increase the risk for certain diseases



Health Attributes of Palm Oil

High in mono-unsaturates (40% 18:1)

Palm Olein = 48% 18:1

Contains EFA (10% 18:2)

Excellent source of Vitamin E

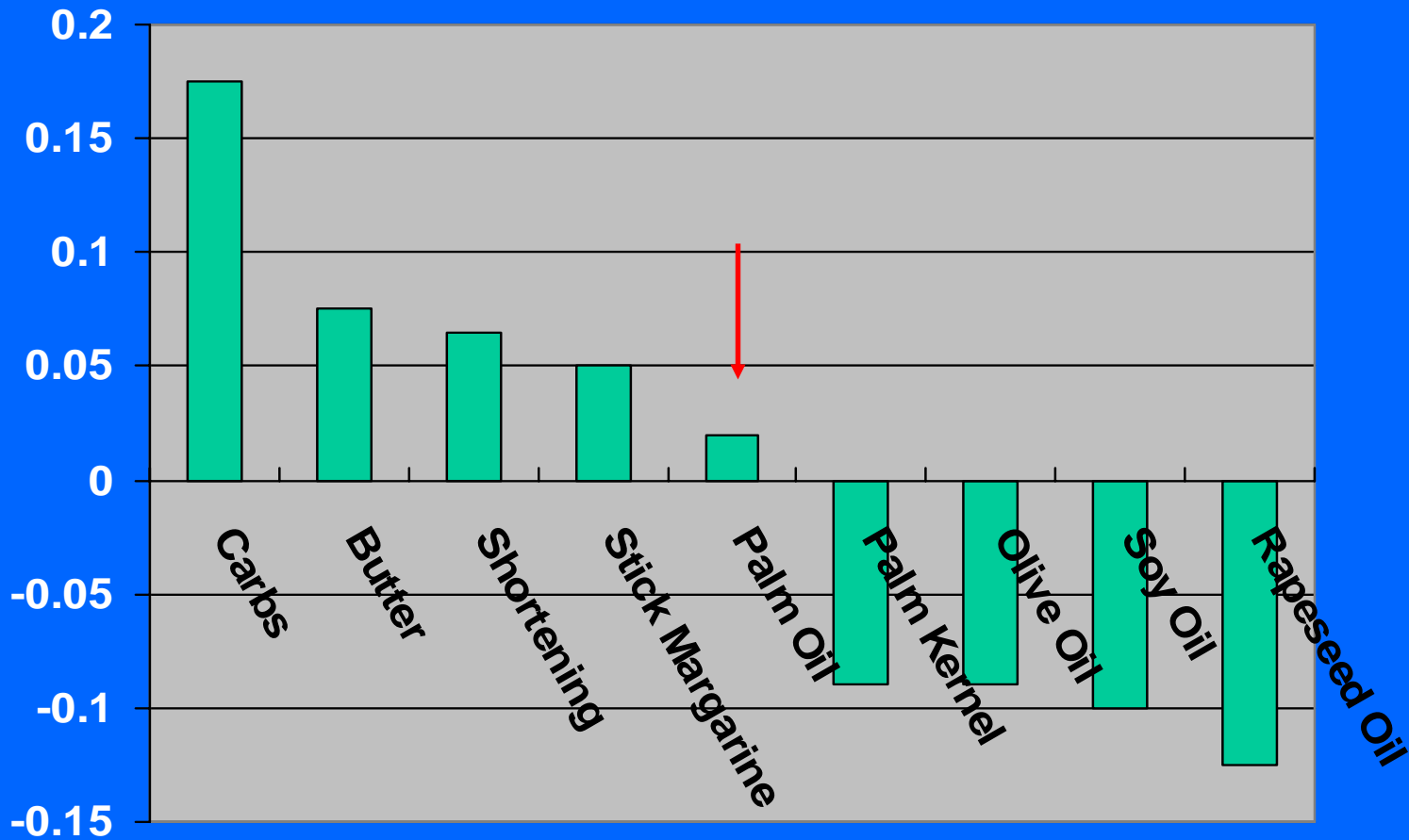
Zero trans

Good source of carotenoids

Reduces lipoprotein related CHD risk factors compared to *trans* fat.



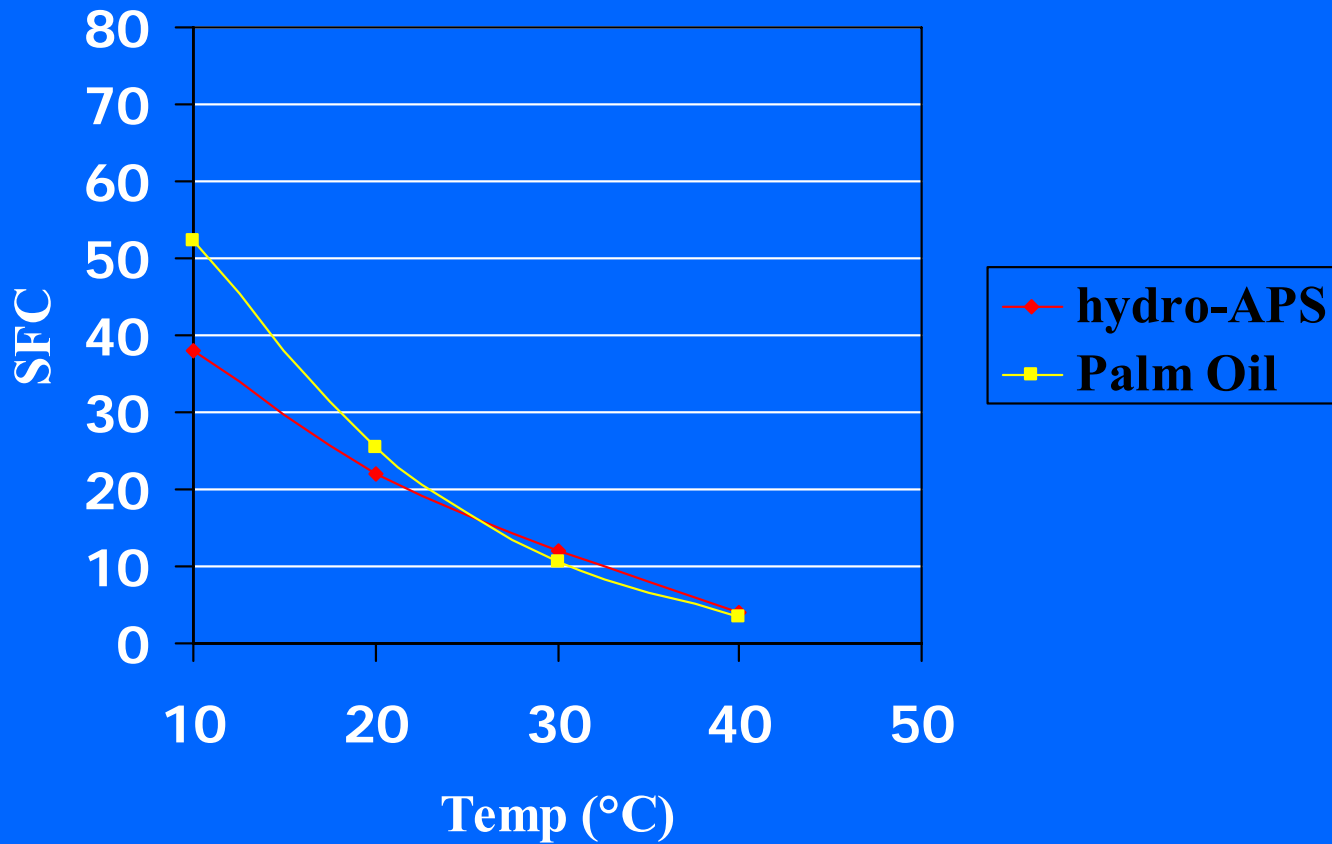
Δ Total:HDL Cholesterol



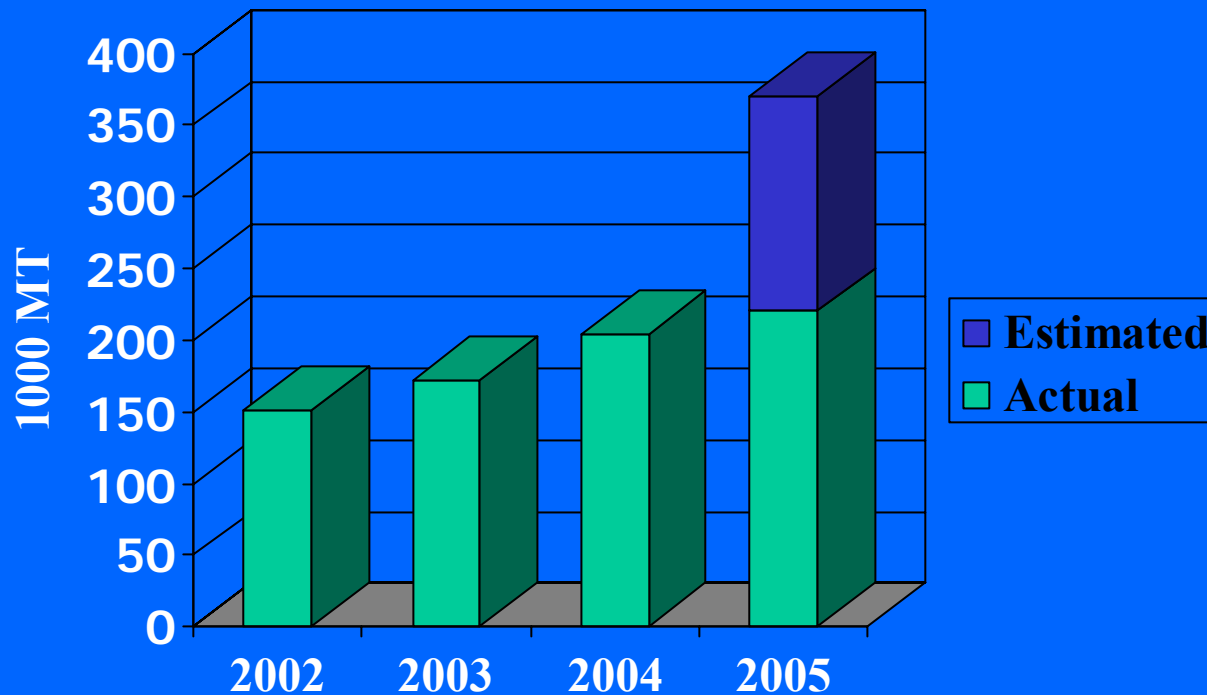
10% Isocaloric replacement of fat in average U.S. Diet

Redrawn from Mensink et al. Am J. Clin Nutr 77:1146 (2003)

Palm Oil is a Logical Alternative to Hydro Fats



Mandatory *Trans* Labeling has Stimulated Palm Oil Imports into U.S.



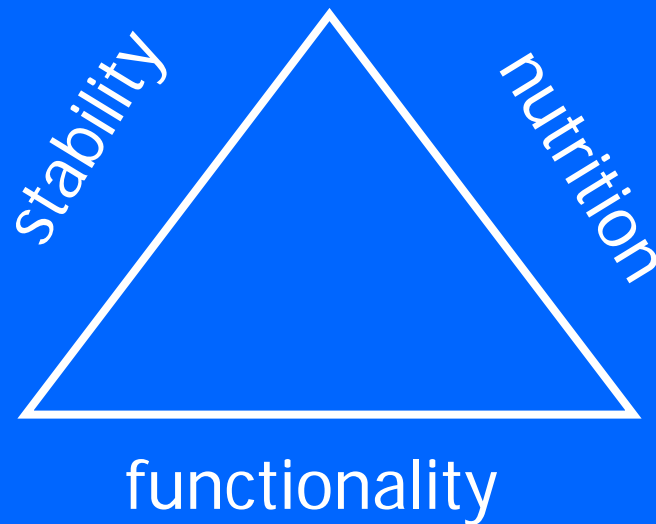
Healthy Oil Blends

Applications

Hierarchy of Reformulation Options

- Liquid oils (may be trait enhanced)
- Blending: liquid oil + hardstock
- Utilizing semi solid fats: palm and Palm kernel
- Interesterification
- Modified hydrogenation

A healthy oil (blend) must also provide the required stability & functionality.



When switching to healthy alternatives
keep in mind.....

- Flavor release
- Stability
- Machine-ability
- Crystallization rate
- Mouth-feel
- SFC requirement
- Oil Migration

Healthy Oil Blends



Fractions of Palm and Palm Kernel Oils can be blended with liquid oils to yield functional shortenings with **less Saturated Fat**.

Healthy Oil Blends

	Industrial APS	Palm Oil	Blend #1 EsSence 86-23	Blend #2 EsSence 86-33
	PH Soy/Cott		Select Frac PO+PK Canola	Select Frac PO+PK Canola
% Sats	19	50	20	24
% <i>trans</i>	31	0	0	0
S + T	50	50	20.5	24.5



Chocolate Chip Cookies

Hydrogenated fat

Nutrition Facts

Serving Size 2 Cookies (39g)

Amount Per Serving

Calories 190 Calories From Fat 80

Total Fat 9g

Saturated Fat 3g

Trans Fat 2g

S + T = 5g

No-*trans* Blended Fat
(EsSence 86-33)

Nutrition Facts

Serving Size 2 Cookies (39g)

Amount Per Serving

Calories 190 Calories From Fat 80

Total Fat 9g

Saturated Fat 3g

Trans Fat 0g

S + T = 3g



Score Sheet

Control

No-trans Blend

Symmetry	normal	normal
Crust Character	good	good
Texture	crisp	crisp
Aroma/Flavor	typical	typical
Weight of 4 Cookies (g)	78.1	77.6
Spread ratio	4.5	4.4

Puff Pastry

Reducing Sats and *Trans* is a Challenge!!

	Serv Size (g)	Fat (g)	Sats (g)	<i>Trans</i> (g)	S + T
Hydro shorten.	30	17.5	5.4	5.6	11.0
Butter	30	17.5	10.9	0.53	11.4
EPP Palm/Canola Blend	30	17.5	8.4	-	8.4



Sandwich Cookies

PH-
Shorten.

No-trans
Blended Fat
(EsSence 83-23)

Serv Size	Fat (g)	Sats (g)	Trans (g)	S+T
3 cookies (32g)	6.7	1.28	1.87	3.15
3 cookies (32g)	6.7	1.34	-	1.34

SUMMARY

The view of “Healthy Oil” has evolved and will continue to evolve.

Palm oil has many healthy attributes and is a logical contender as a *trans* fat replacement.

A fat with a “healthy profile” is not sufficient. Fat must also provide the functionality demanded by the specific application.

Blending liquid oils with functional solid components is one way to bring together health and functionality.