Trans Fats Mastering the Maze

Global Oils and Fats Forum

Las Vegas, NV

September 2007

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Trans Fat Climate Today

- Thousands of foods have been reformulated to eliminate *trans* fatty acids
- Company benchmarks for new product formulations – even absent a health message – usually demand label of '0 grams *trans* fat'
- Despite media coverage, *trans* fat is **NOT** a prominent trend in health and wellness*
  - Seeking Balance
  - Functional Food
  - Paradox of Obesity
  - Stress and Tiredness
  - Organic, Sustainable, Pure

*HealthFocus 2007

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Trans fats are the new pariah

- New York City bans TF in restaurant oils and spreads as of July 2007; all restaurant foods by July 2008
- Other cities are following suit: Philadelphia, Seattle, Montgomery County (MD)
- KFC, McDonald's, Wendy's have all changed frying oils nationwide
- The Indiana State Fair – Fried Oreos and Twinkies, OK – if not fried in oil with trans fat

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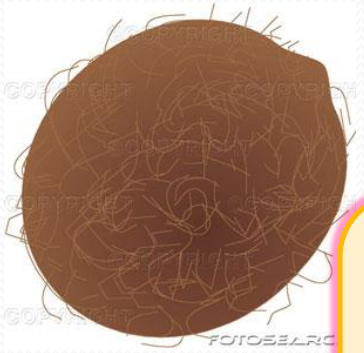
How Did We Get To This Juncture?

- Trans fats were studied from the mid-1980's, but conclusive evidence that they raise cholesterol levels was not widely accepted until the mid-1990's

- 1985: Phil Sokolof began media campaign for companies to stop using coconut and palm oils. His ads proclaimed "The Poisoning of America"



By 1990, most American companies had reformulated food products to eliminate coconut oil and palm oil

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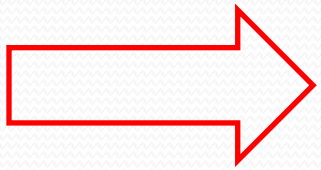
Pathway to Remove Tropical Oils

- Early trans fat research focused on its presence in margarines, which were hardened by partial hydrogenation of vegetable oils



Partially-hydrogenated Oils Used for Cooking, Baking

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Partially Hydrogenated Oil Balance Sheet

- Pros
  - Cost
  - Availability
  - GRAS
  - Stability
  - Labeling (not saturated)
  - Consumer Acceptance

- Cons
  - Not a ‘natural’ oil
  - Flavor different than saturated vegetable oils
  - Health concerns begin to be documented

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Nutrition Label for Trans Fat

- FDA announced proposed label change Nov. 1999
  - Petition for labeling was submitted to FDA in 1994
- 2002 Institute of Medicine report urging reduction in and trans fatty acids when reducing total fat intake spurred adoption of the rule
- 2002 –FDA proposed a footnote to nutrition label, indicating that trans fat intake should be 'as low as possible'
  - Subsequent research showed that the footnote could mislead consumers into selecting foods with more saturated fat
- Trans fat is not included with saturated fat when calculating percent Daily Value
- Final rule in 2003 with labeling effective Jan. 1, 2006

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Final Rule – Trans Fat Label

- Trans Fat is listed on a separate line below saturated fat
- Trans fat levels less than 0.5 grams per serving can be listed as '0' grams
- **No** nutrient content claims have been approved
  - Prohibited to say 'Trans Fat Free' or 'low in Trans Fat'

Effective January 1, 2006, *trans* fat is listed on the Nutrition Facts Panel below saturated fat.
Trans fat is rounded to nearest 0.5 grams per serving.

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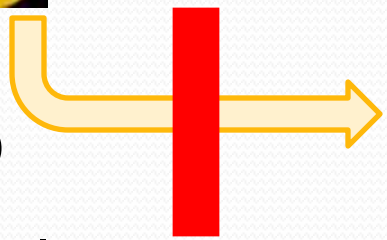
Trans Fat Alternatives

- Liquid Vegetable Oils
  - Corn
  - Soybean
  - Canola
  - Cottonseed
  - Sunflower (to a limited extent)



TRANS FAT

- Solid or Semisolid Vegetable Oils
  - Palm kernel
  - Palm olein (palm oil)
- Commercially available in 2007, but not previously
  - Low linolenic soybean oil
  - High oleic canola oil

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Brief Review of Oilseed Fatty Acid Composition

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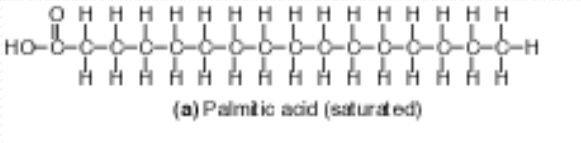
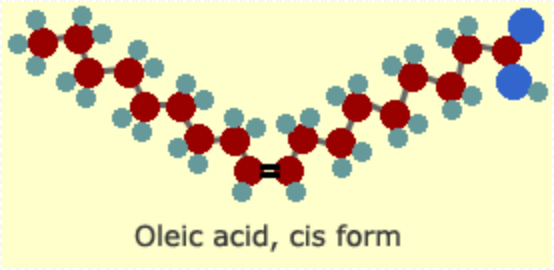
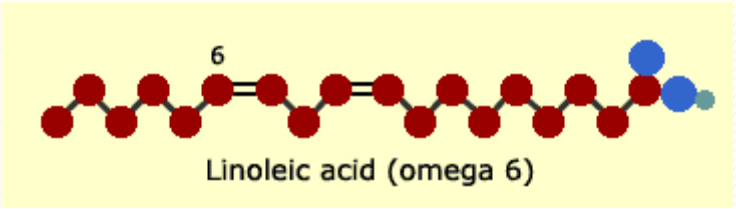
Saturated Fat
(Palmitic Acid C16:0)



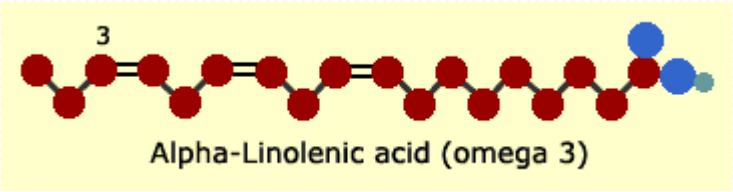
Unsaturated Fats



Oleic Acid (C18:1)



Linoleic Acid (C18:2)



Linolenic Acid (C18:3)

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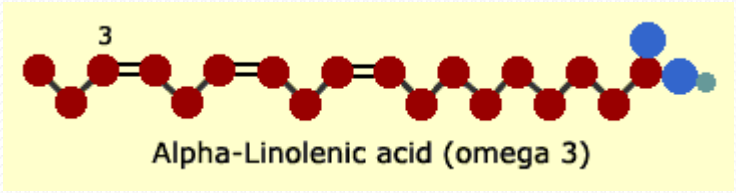
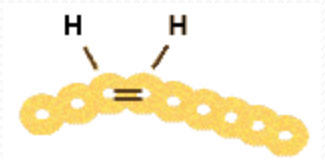
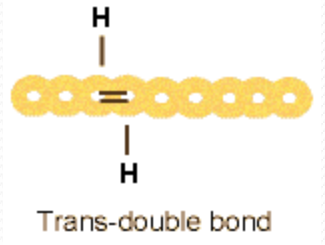
Significance of Fatty Acid Structure







- Double bonds create instability with potential for oxidation

  Partial hydrogenation reduces the number of double bonds
- Problem – It creates *trans*-bonds, not the natural *cis*-double bond

C18:3 + H2 ⟹ C18:1 (trans)

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News: Not All Saturated Fats Are Created Equal

Stearic Acid (C18:0)
Found in Beef, Chocolate

Neutral effect on blood cholesterol

Palm Oil –44% palmitic acid (C16:0)
39% oleic acid (C18:1)

Raise blood LDL; does not lower HDL

Food manufacturers ask:
Given no change to the nutrition label, will the public understand if foods contain "healthier" saturated fats?

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Early Reformulations based on Shelf Life

- Shorter Shelf Life
  - Deep-fat frying- Corn or other oils can be used
  - Baking-Texture suffers with most polyunsaturated oils

- Longer Shelf Life
  - Deep-fat frying -oil blends of polyunsaturated oils (soybean, cottonseed, canola, corn) with partially-hydrogenated or palm oil
  - Baking – Same issues of texture

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From 2006, *Trans* Fat Alternatives Grew

- In 2006, new oilseed varieties became available commercially
  - Kellogg's incorporated low-linolenic soybean oil (Vistive™) into cereal to eliminate trans fat (2006)
  - Taco Bell adopted high-oleic canola oil (2007)
- Combinations of oils increased in popularity
  - Wendy's – corn and soy oils
  - McDonald's – canola, corn, and soy
  - Some breakfast cereals – palm, soy, and cottonseed

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How do you determine which oil or combination of oils works best in your product?

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Choosing Which Oils to Test

- Cost
- Availability
- Fatty Acid Profile

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Test Benchmarks I

- Nutritional Quality
  - Does product retain declarable '0 grams *trans* fat' during shelf life? This is particularly important during prolonged high-temp deep-fat frying
  - Does product meet <u>your</u> benchmarks for fat distribution?

Nutrition Facts

Serving Size 1 cup (228g)
Servings Per Container 2

Amount Per Serving

Calories 260 — Calories from Fat 120

	% Daily Value*
Total Fat 13g	**20%**
Saturated Fat 5g	**25%**
Trans Fat 2g	
Cholesterol 30mg	**10%**
Sodium 660mg	**28%**
Total Carbohydrate 31g	**10%**
Dietary Fiber 0g	**0%**
Sugars 5g	
Protein 5g	

Vitamin A 4% • Vitamin C 2%
Calcium 15% • Iron 4%

* Percent Daily Values are based on a 2,000 calorie diet. Your Daily Values may be higher or lower depending on your calorie needs:

	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

Calories per gram:
Fat 9 • Carbohydrate 4 • Protein 4

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Σ(Trans + Saturated) ≥ (Saturated)

Current Formulation Reformulated without Trans

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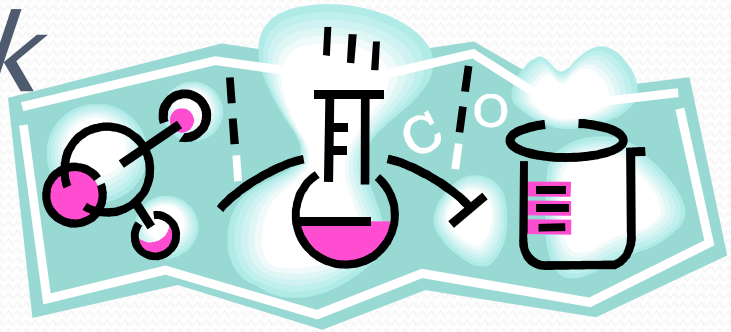
Nutrition Benchmark



- Is nutrition analysis based on laboratory analysis or database (DB) calculation?
  - If DB, you should verify with lab testing
  - Challenges to your numbers can come from consumer groups, local government, media
  - Many DB programs have incomplete data for *trans* fat

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Test Benchmark 2 –Oil Quality

- How well does the oil hold up over time? Does it break down? Form polar compounds?
- Does it create off-flavors or off-odors?
- Does it require special handling to use and/or discard?
- Does staff need special training to handle the oils? (Restaurant-specific)
- Do cooking time or temperature set points need to be adjusted?

"Got it boss. We're not putting the trans fat in today."

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Test Benchmark 3 – Consumer Acceptance

- Sensory acceptance often most difficult to attain
- Requires multiple test cycles while tweaking formulations
- Test new product with most loyal consumers who can detect minor changes
- What is the standard?
  - No different from original product? OR
  - Different, but as good as or better than original product?

- Standard consumer preference tests may require additional parameters – check for waxy or greasy mouthfeel or handling

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COMMUNICATE THE BENEFITS…

DO YOUR CONSUMERS WANT THIS BENEFIT?

Remember New Coke?

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Transition to 0 Gram Trans Fat Product

- Announcing the claim invites scrutiny, verification challenges
- Some consumers perceive the product has inferior flavor, once aware of the change
- Some consumers buy/try reformulated product as they perceive it to be healthier

No clear-cut path to proclaiming the oil change. As more companies reformulate, news interest wanes.

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Watch-outs

New oils and oil combinations require continued testing

Potential backlash against saturated fat or total fat

Key health organizations continue to stress reducing both saturated and trans fat

American Heart Association

American Diabetes Association

American Dietetic Association

Dietary Guidelines for Americans (USDA and HHS)

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In Summary

Success in eliminating trans fat is likely if
- Nutritional Value
- Oil Quality
- Consumer Acceptability

… all exceed your benchmarks

However, ‘trans’ may mean not only Trans Fat
But a transitory health trend

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