TRANS FAT REPLACEMENT ROUNDTABLE

Key Statements

May 13, 2005

TRANS FAT | REPLACEMENT ROUNDTABLE

This roundtable was held to provide guidance to the food industry on possible replacement options for hydrogenated fats and trans fatty acids

TRANS FAT REPLACEMENT ROUNDTABLE

Moderator
Dennis Bier, M.D.
Professor of Pediatrics, Baylor College of Medicine

Participants
Margo A. Denke, M.D.
Clinical Professor of Medicine, University of Texas Health Science Center, San Antonio

Joseph Judd, Ph. D.
Former Research Leader, Diet and Human Performance Laboratory, Beltsville Human Nutrition Research Center, USDA Agricultural Research Service

Richard O'Brien
Industry Consultant, Author, "Fats and Oils Formulating and Processing for Applications"

Fran Seligson, Ph. D.
Independent consultant and Associate Professor in the Nutrition Department at Penn State

Howard Weintraub, M.D.
Co-Clinical Director, Lipid Treatment and Research Center, New York University Medical Center, Clinical Associate Professor of Medicine

TRANS FAT REPLACEMENT ROUNDTABLE

- Hydrogenation is a controlled chemical process where a vegetable oil is purposefully altered to create an oil with pre-specified functional properties
- Hydrogenation modifies the polyunsaturated fatty acids in the oils creating trans fatty acids
- Trans fatty acids change the functional properties of the fat
- Functional properties of a hydrogenated fat or oil are affected by the degree of hydrogenation
  - Minimal hydrogenation reduces the easily oxidized unsaturated fatty acids for improved flavor stability
  - More extensive hydrogenation creates solid fats which enhance baking properties

TRANS FAT REPLACEMENT ROUNDTABLE

- Trans fatty acids are present in partially hydrogenated vegetable oils and fats from ruminant animals
- Trans fatty acids increase LDL cholesterol levels in humans and, at high levels of consumption, also lower HDL cholesterol levels
- High LDL cholesterol levels & low HDL cholesterol levels have been associated with cardiovascular disease in man
- The trans fatty acid content of foods should be reduced or eliminated whenever possible
- It is recommended that where ever possible hydrogenated fats should be replaced with non-hydrogenated vegetable oils
- For any replacement fat, a goal should be set for the new product to contain no more saturated fatty acids plus trans fatty acids than the original product

TRANS FAT REPLACEMENT ROUNDTABLE

- Possible natural fat replacements for hydrogenated fats:
  - Oils rich in polyunsaturated fatty acids are poor replacements for hydrogenated fatty acids as these oils are liquid at use temperatures and readily susceptible to oxidation
  - When food functionality requires a solid fat for food taste or texture, oils rich in polyunsaturated fatty acids may not have the proper functionality for long shelf life as these oils are readily susceptible to oxidation when used, making them a poor replacement for hydrogenated fatty acids
  - When food functionality requires a solid fat, palm oil and coconut oil may be reasonable natural replacement fats:
    - Palmitic acid, the fatty acid which predominates in palm oil, has been shown to increase LDL cholesterol and also increases HDL cholesterol but to a lesser degree
    - Lauric acid, the fatty acid which predominates in coconut oil, has been shown to increase LDL cholesterol and also increases HDL cholesterol but to a lesser degree

TRANS FAT REPLACEMENT ROUNDTABLE

- Alternatives to natural fats may include fats and oils modified by an interesterification process
  - During interesterification, fatty acids are rearranged on their original backbone altering the functionality of the fat making it suitable for replacing hydrogenated fats that contain trans fatty acids
  - Interesterification affects the fatty acid position on the triglyceride but does not necessarily alter the cholesterol raising properties of the fat
  - In the process of interesterification a variety of fats can act as a fatty acid source including but not limited to:
    - Almost fully hydrogenated soybean oil with a predominance of stearic fatty acid, which has been shown not to affect LDL or HDL cholesterol
    - However, the overall effect of widespread increases in dietary interesterified stearic acid on cardiovascular risk is not known. In one study, interesterified fat high in stearic acid fed at high amounts increased fibrinogen levels, a biomarker for increased risk of blood clotting with less cardiac risk than other markers such as LDL
  - Whether the process of interesterification changes other cardiovascular risk factors is unknown

TRANS FAT REPLACEMENT ROUNDTABLE

- The long-term risks/benefits of using natural occurring saturated fats versus interesterified fats in the food supply is not known
- Based on the sole criteria of changes in cholesterol from removing trans fatty acids an overall benefit is expected