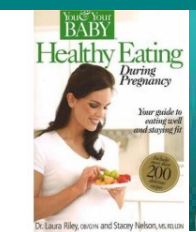
In Search of the Holy Grail
The Perfect Oil – Perfect Health?

September 14, 2007
Las Vegas, Nevada

William R Archer MD
Managing Director
Burson-Marsteller

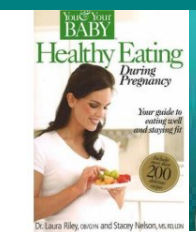







Food Oil Challenges: Beyond the Trans Fat Debate

- Growing science on the complexity of fatty acids
- How do we manage health related to dietary intake of fatty acids?
- What is the media to do with it all?








TRANS FAT REPLACEMENT ROUNDTABLE

May, 2005

Moderator

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

Participants

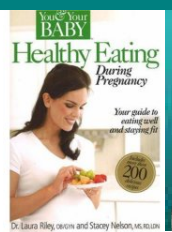
Margo A. Denke, M.D.
Clinical Professor of Medicine, University of Texas Health Science Center, San Antonio

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

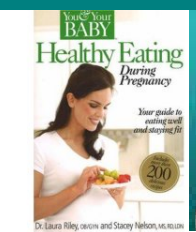







TRANS FAT | REPLACEMENT ROUNDTABLE

- 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 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

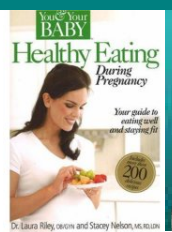







TRANS FAT | REPLACEMENT ROUNDTABLE

- 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

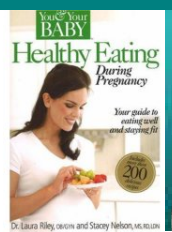







TRANS FAT | REPLACEMENT ROUNDTABLE

- 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

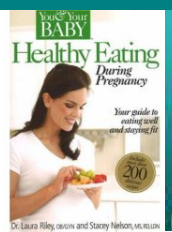







AHA Trans Fat Conference Oct, 2006

- Funded by McDonalds because of trans fat issues
- Objectives
  - Interactive and collaborative forum to discuss current status and future implications of reducing trans fats without increasing saturated fats as part of a balanced diet
  - Assist the AHA to further the understanding of ways to improve the fatty acid profile in foods and reduce trans fats in the food supply, while maintaining functionality and consumer acceptance
  - Proceedings to be publish in March 2007, *Circulation*

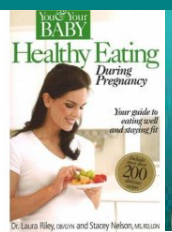







Results of Conference

- Health advocates wary of sats – epidemic of obesity and heart disease in the US
- Only small percent of conference attendees felt that food could be reformulated without use of sats
- Belief that frying situation can be changed easily with use of polyunsaturated oils
- Baking and snack foods will be harder to reformulate – MPOC partner responsible for speaker at AHA Conference



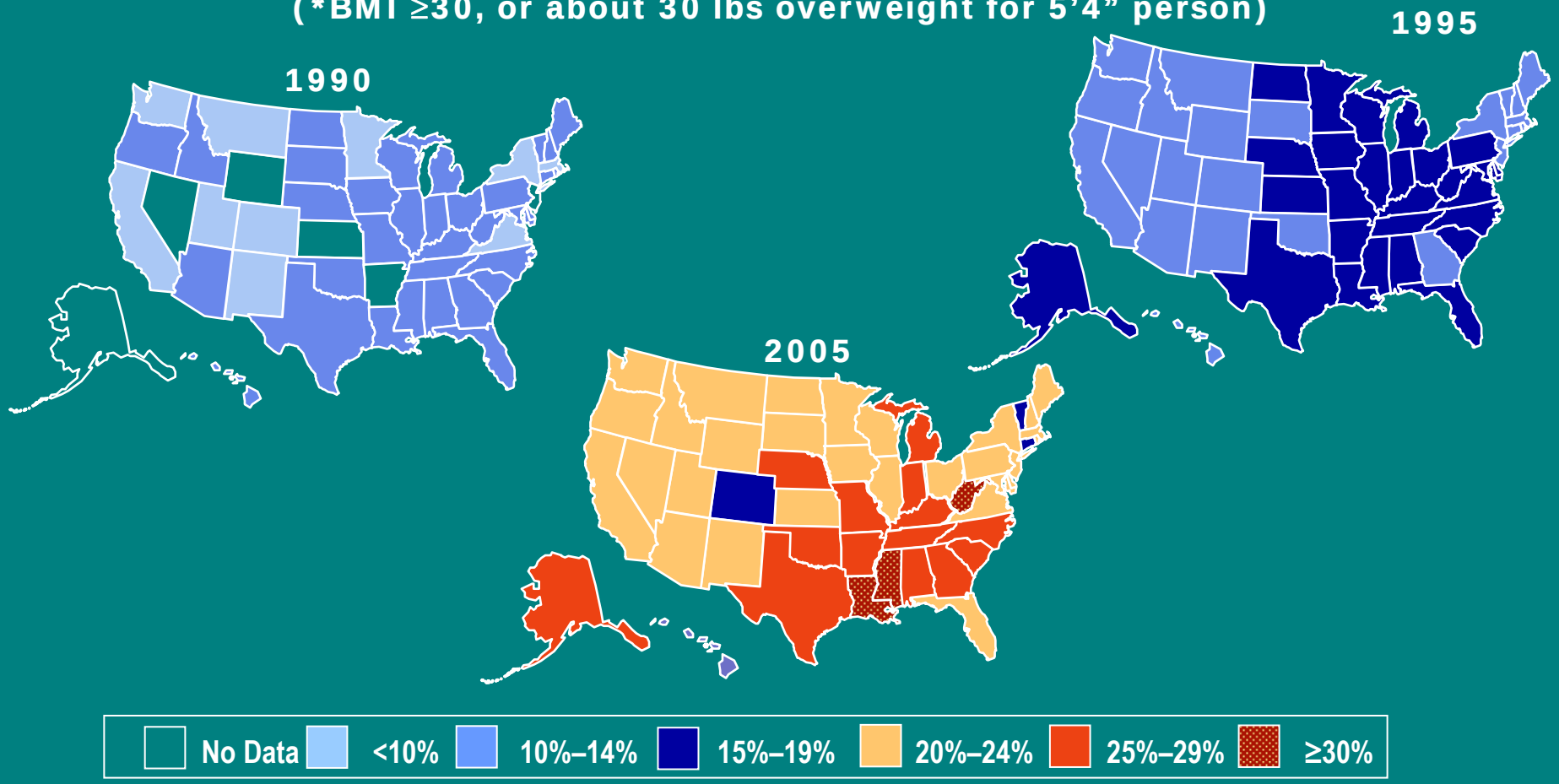


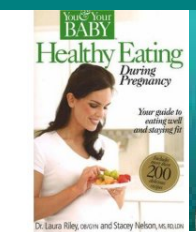



Obesity Trends* Among U.S. Adults

BRFSS, 1990, 1995, 2005

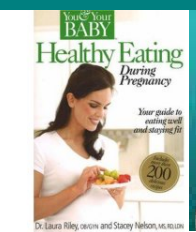
(*BMI ≥30, or about 30 lbs overweight for 5'4" person)





Health

- Obesity on the rise globally but worse in US… leads to high health costs
- Public health officials want passive ways for people to improve health
- And assumptions about proper nutrition vary based on the organ system that we are most concerned about – AHA, ADA and ACS

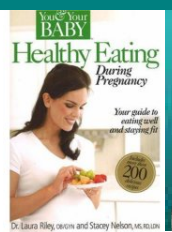







Health

- Optimal oils should not:
  - Raise LDL or lower HDL
  - Increase inflammatory markers
  - Increase the caloric content of a particular food
  - Increase metabolic syndrome – lipogenesis leading to diabetes

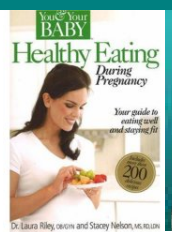







Health and food oils for manufacture …

- Must be:
  - A value
  - Durable
  - Functional across a variety of food needs in baking, frying, prepared foods
  - Readily Available

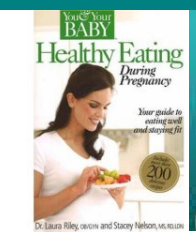







Health

These ideal oils do not exist and there are currently no replacements that are not oil based for food preparation





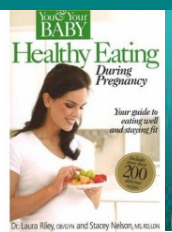



“You Americans are afraid of your food!!”

Frenchman on NPR, 2002

The Washington Post 2007
CAHORS, France -- For her 100th birthday party last October, Helene Vialard indulged in her favorite meal -- coq au vin. She adores the local Cahors red wines, occasionally eats a sliver of foie gras, another regional specialty, and says she has no secret for reaching the century mark: "It just came on its own. I never thought I would live this long."

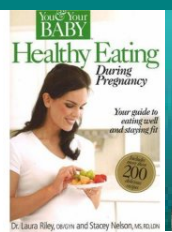
The women of France, a land renowned for a cuisine laden with fats and calories, have the longest life expectancy of any nation on Earth except Japan. A baby girl born in France in 2006 can expect to live until she is at least 84, surpassing a baby boy's potential by seven years, according to new government statistics. Only Japanese women have a longer life expectancy, 85.6 years. American women can expect a life span of 80.1 years, recent statistics show








- Three common oils in foods
  - Long-chain omega-3 fatty acids
  - PUFAs
  - Palm and other saturated oils

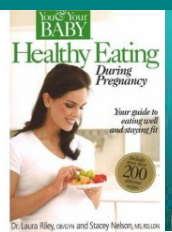







Two challenging question

- When we measure the impact of a single oil in the diet on health is this adequately reflective of the most important drivers of health?
- Can we generalize recommendations when we know that there are numerous variables that impact health outcomes?

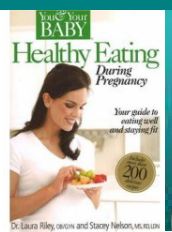







Long-Chain Omega-3 Fatty Acids

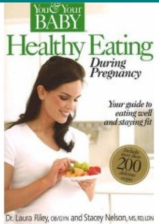
- **June 2007**
  Heart Health Taking a Statin? Adding Fish Oil May Boost Its Power Fish Oil EPA Slows Progress of Atherosclerosis in Diabetic Patients Got Rhythm? High Fish Consumption Linked to Improved Electrocardiograms Taking Fish Oil Omega-3s to Heart United Kingdom Recommends Omega-3s to Prevent Second Heart Attack
  Mothers & Infants Eating for Two: Extra DHA in Pregnancy Benefits Infants' Visual Acuity Increasing Long-Chain Omega-3 Intake in Pregnancy Benefits Mothers and Infants
  Immune Function Beyond Skin Deep: Eating Fish in Late Pregnancy Lowers Chance of Infant Eczema Maternal Fish Intake in Pregnancy May Reduce the Child's Chance of Eczema Does Fish Oil Hasten Immune System Maturation in Infants?
  Mental Health Improved Attention, Activity and Impulsiveness in ADHD Children Given Fish and Primrose Oils Feeling Down? Maybe It's Time for a Fat Checkup Brain Volume in Key Areas Linked to Omega-3 Intake: Is Bigger Better?








	Tissue target	Concurrent dietary intake (en%)			n-3 HUFA required to meet tissue target in each country	
COUNTRY	% n-3 in LCFA	LA	α-LNA	AA	(en%)[2]	(mg/d)[3]
Philippines	60%	0.80	0.08	0.06	0.125	**278**
Denmark	60%	2.23	0.33	0.09	0.45	**1000**
Iceland	60%	2.48	0.33	0.10	0.54	**1200**
Colombia	60%	3.21	0.24	0.04	0.51	**1133**
Ireland	60%	3.57	0.42	0.06	0.62	**1378**
UK	60%	3.91	0.77	0.07	0.72	**1600**
Netherlands	60%	4.23	0.28	0.08	0.88	**1956**
Australia	60%	4.71	0.49	0.07	0.90	**2000**
Italy	60%	5.40	0.51	0.06	0.95	**2111**
Germany	60%	5.57	0.62	0.06	1.00	**2222**
Bulgaria	60%	7.02	0.06	0.05	1.25	**2778**
Israel	60%	7.79	0.67	0.07	1.45	**3222**
USA	60%	8.91	1.06	0.08	1.65	**3667**

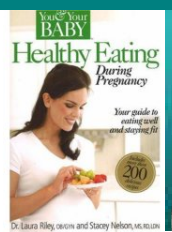







Hibbeln et al. Am J Clin Nutr 2006; 83; 1483S-93S

- PUFAs have clearly emerged as therapeutic players in the prevention/treatment of various chronic diseases, as well as being critical to the developing brain. While these effects are clearly desirable, there is also some concern over excess consumption of certain types of PUFAs that give rise to pro-inflammatory and pro-aggregatory metabolites. Therefore, it has been very difficult to establish a valid nutritional recommendation for optimal consumption of these fatty acids.
- **James M. Ntambi, Ph.D.**
Professor of Biochemistry and of Nutritional Sciences
University of Wisconsin-Madison
Madison, WI, USA








Essential Fats: Metabolism and Dietary Sources

Omega-6

18:2n-6 linoleic acid, LA

Soy bean oil
Safflower oil
Corn oil

Omega-3

18:3n-3 linolenic acid, LNA

Canola oil
Flax seed
Leaf plants

competition for
Δ6 and Δ5 desaturase
and elongation
enzymes

20:4n-6, arachidonic acid
AA

Meat,
Organs

20:5n-3,eicosapentaenoic acid,
EPA

Fish
Seafood
Seaweed

Series 2 Prostaglandins
Thromboxanes
Series 4 Leukotrienes

Series 3 Prostaglandins
Thromboxanes
Series 5 Leukotrienes

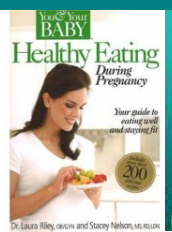
22:6n-3, docosahexaenoic acid,
DHA
(brain, retina, testis)

platelet activity
immune responses
smooth muscle
Bone health

- “In most prospective studies, consumption of SFA and cholesterol are not strongly associated with CHD death”

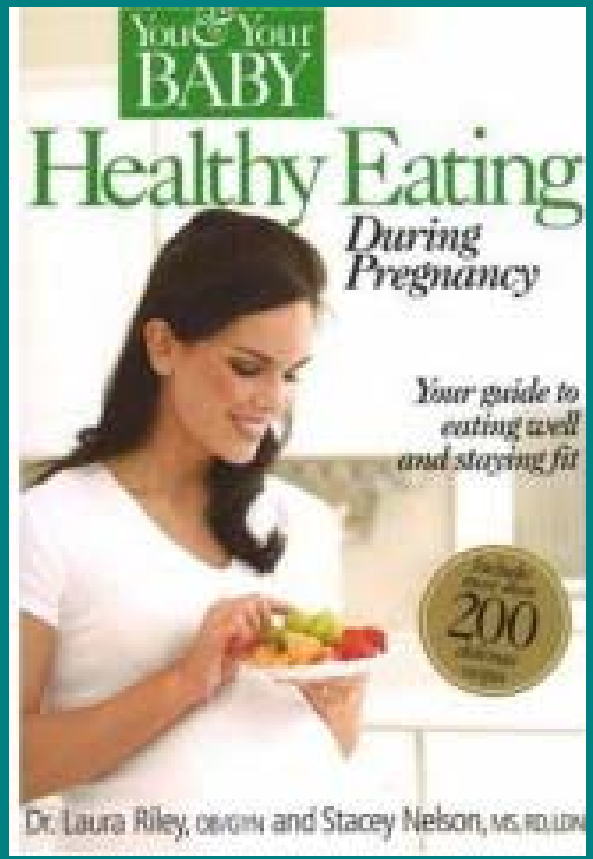
Dariush Mozaffarian

Harvard School of Public Health





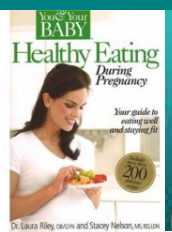


Newsweek

September 17, 2007

The "Barker Hypothesis" is still hotly debated, but it is gaining acceptance as the evidence builds. Because organs develop at different times, it appears that the effects of too little food during pregnancy vary by trimester. One example comes from study of the Dutch Hunger Winter, a brief but severe famine that occurred during World War II. Pregnant women who didn't get enough to eat in their first trimester had babies who were more likely to develop heart disease. If they were in their second trimester, their babies were at risk for kidney disease. A poor diet in the last three months led to babies who had problems with insulin regulation, a precursor of diabetes.







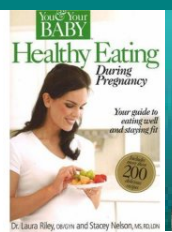

Release Date: Dec. 10, 2002

SOCIAL ISOLATION LEAVES ELDERLY AT RISK FOR HEART TROUBLE

By Becky Ham, Staff Writer
Health Behavior News Service

Loneliness, lack of emotional support and lack of companionship or social support can leave elderly men and women vulnerable to heart problems, according to new research in the December issue of the journal *Annals of Behavioral Medicine*.

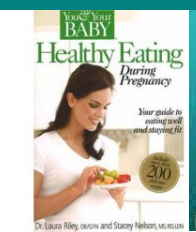
Dara Sorkin, a Ph.D. candidateof the University of California, Irvine, and colleagues found that for every unit increase in loneliness as measured among older adults in their study, there was a threefold increase in the odds of being diagnosed with a heart condition.








What is the media to do?








Everything in moderation

- Sat fats
- PUFAs
- Monos- oleic oils

More

- Long-chain omega-3s

Most importantly

- Eat well in pregnancy, exercise, enjoy life and *your food* and see the doctor as little as you can