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Editorial

Edible Oil Consumption Patterns in the US

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Over the past decade consumption of edible fats and oils has undergone considerable change. A number of factors including consumer awareness of nutrition /health attributes of various fats and oils, dietary guidelines, and legislation in the form of nutrition labeling of saturated and trans fats. The US government publishes dietary guidelines every 5 years. From 1980 until 1995 the guidelines emphasized keeping saturated fat and cholesterol consumption as low as possible, Tropical oils including palm/palm kernel and coconut along with animal fats (lard Tallow) are the largest source of saturated fat and cholesterol of which are risk factors for coronary heart disease. The food industry responded with low fat foods and replacement of saturated fat with hydrogenated oils. Thus saturated fat was taken out of many foods at the expense of increased Tran's acids resulting from catalytic hydrogenation of edible oils.

Prior to 1990 the US Food and Drug Administration took the position that insufficient data prevented regulation of Tran's fats. However in 1990 two key events occurred. The US Congress passed the Nutrition Education Labeling Act (NELA) requiring both Trans and saturated fats to be listed on nutrition labels. Secondly Mensick and Katan reported that trans fats elevate serum cholesterol levels in humans and trans fats may pose a risk factor for coronary heart disease [1]. At the time NELA was passed and the initial draft completed in 1994 trans fats were not included . Several groups petitioned the FDA to include both saturated fats. The second draft published in 1999 included both types of fat and after public comment final rules were published and became law in July 2003 [2]. Key provisions were the law would become effective January 1, 2006 and foods containing less than 0.5 grams Trans fat /serving could be labeled zero.

Thus the food industry had 3 years to reformulate foods to meet NELA requirements The snack food industry took the lead by replacing high trans oils with unhydrogenated zero trans oils Others switched from hydrogenated frying shortening to trait modified soybean , canola, and sunflower oils. These provide a Trans free option and in some cases a reduction in saturated fat as well. Early approaches to Tran's fat reduction often involved replacement of hydrogenated fats with palm oil or palm fractions.

The edible oil processing industry responded by the introduction of Trans free fats via interesterification of liquid (zero Trans) and completely hardened soybean or cottonseed oil. The base oils produced offer considerable flexability for food formulations since the melting points and solid fat contents can be tailored by the addition of either liquid oil or hardstock.

Other processors offered Trans free oils by modification of existing hydrogenation technologies. By carrying out the hydrogenation reaction at lower temperature and higher pressures with a chemically modified catalyst significant Tran's fat suppression can be achieved with a low or zero Tran's oil.

Blending of liquid oils with tropical fats and their fractions has been employed by the industry to offer Trans fat replacements many of which serve in baking applications where solid fat is needed for functional purposes. (Aeration, structure, mouth fee, lubricity)

Trait modified oils in which the fatty acid composition have been changed by traditional plant breeding were introduced into the market place in the early 1990s. However while performing well in food applications increased costs due to grower premiums and identity preservation made them unattractive and were discontinued. The trait modified oil industry has re emerged as a source of Trans fat replacement .It is now estimated that trait modified soybean (lo linolenic, mid/high oleic) canola (hi oleic, lolinolenic) and sunflower (mid/hi oleic) supply about 18% of domestic edible oil consumption. They are popular because they are trans free , and are more oxidative stable than commodity oils and in some cases are lower in saturated acids. The food service industry finds trait modified oils suitable for deep fat, pan and griddle frying as well as sprays oils for crackers and cookies. Trait modified oils perform well in some baking applications including baked snack crackers where extended shelf life is desired.

Perhaps the most significant change in edible oil consumption is reflected in shifts in the use of hydrogenated fats for baking/frying of which traditionally was supplied by soybean oil. Over the period 2000-2010 hydrogenated baking/frying fat consumption decreased from 9315 million pounds to 4756 million pounds. On the other hand salad/cooking oil consumption (which includes liquid or lightly hydrogenated) shows a marked increase over the same time frame. 10144 million pounds 2000 vs. 16593 pounds in 2010. Thus the use of liquid oils has increased significantly largely due to Trans fat labeling [3]. The food service industry is exempt from trans fat labeling .However FDA has recently announced that a ban on trans fats throughout the food system is likely.

Other trans fat replacements include animal fats (butter, lard, tallow) and palm /palm kernel oils Over the period 2000-2010 little change in animal fat consumption. However Trans fat labeling prompted increases in palm oil usage. In 2000 421 million pounds were imported into the US and by 2003 imports began to spike and had doubled by 2004 and tripled by 2005. From 2005-2012 imports increased from about 1400 million to about 2700 million pounds [4].

Several trait modified soybean oils are nearing commercialization using both traditional plant breeding and gene insertion techniques. These include a low saturate /hi oleic and an omega-3 enriched oil.

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These are designed for not only food use but increased nutritional benefits as well. Studies have shown that the low sat/hi oleic oil performs well in deep fat frying with reductions in Trans and saturates in fried potatoes and chicken. The omega -3 enriched lines contains about 35% of omega -3 acids which the body can convert to EPA.

While the role of dietary acids on human health is controversial there is little doubt that increased per/capita consumption of fats and oils play a significant part in the obesity epidemic. Over the 2000-2010 timeframe per/capita consumption has increased from about 73 to over 82 pounds [4]. The popularity of fast foods coupled with lifestyle changes is becoming more prevalent with time. The cost of reformulating to zero Trans was considerable. A major snack food company spent 25 million dollars to reformulate 190 products requiring 7200 man hours [5]. Only time will tell whether Trans fat reformulation justifies the time and expense expended.

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