



FOOD TECHNOLOGY FACT SHEET

Adding Value to OKLAHOMA

405-744-6071 • www.fapc.biz • fapc@okstate.edu

June 2017

Trans Free Fat Alternatives

Nurhan Dunford

FAPC Oil/Oilseed Specialist

In previous fact sheets (FAPC-133 *Trans* Fats, Health and Nutritional Labeling of Foods and FAPC-134 Formulating Food Products with Low *Trans* Fats) health effects of *trans* fats and U.S. Food and Drug Administration (FDA) labeling rule regarding foods containing *trans* fats were discussed. Since then a number of new low *trans* and *trans* free fat alternatives have been developed by the edible shortening and oil industry. This fact sheet will highlight some of these products. While reading this fact sheet, it is important to keep in mind that currently “no *trans*” and “zero *trans*” claims refer to 0.5 grams or less *trans* fat per serving (see FAPC-133 for the recent regulation). The serving size is defined as 1 tablespoon or about 12 grams.

Fats/oils are essential components of a balanced diet and play a critical role in disease prevention and treatment. Omega-3 (see Fact Sheet FAPC-135 for more information on omega-3 oils) and conjugated linoleic acid-containing fats/oils have a number of health benefits including reducing body fat, increasing lean muscle mass, decreasing risk factor for late-onset of Alzheimer’s disease and improving cardiovascular health.

Trans fats or *trans* fatty acid-containing fats/oils, naturally occur in meats and dairy products. Concerns over the adverse effects of *trans* fats are not for the ones naturally present in foods but for the ones formed during hydrogenation of vegetable oils. Today, there is a significant body of scientific evidence indicating that *trans* fatty acids increase low density lipoprotein (bad cholesterol) and decrease high density lipoprotein levels (good cholesterol).

The fatty acid composition of fats and oils determines their oxidative stability (Table 1). Oils containing highly unsaturated fatty acids (i.e. polyunsaturated acids such as linolenic, linoleic, eicosapentaenoic-EPA and docosahexaenoic acids-DHA) are prone to rapid oxidation. The majority of plant oils do not contain a significant amount of EPA and DHA. However, traditional soybean and canola varieties have substantial amounts of linolenic acid, which makes them unsuitable for some food applications such as deep fat frying. The degradation products of linolenic acid can result in strong off-flavors. Oils with lower levels of linolenic acid have dramatically improved flavor profiles.

Hydrogenation reduces the number of double bonds in unsaturated fatty acids. There are two main reasons for hydrogenating vegetable oils: to increase stability by reducing the tendency to oxidize thereby extend shelf life and fry life and to change the physical characteristics for easier handling and consistency for improved functionality such as aeration, mouth feel and texture. Fats and oils containing low levels of linolenic acid without partial hydrogenation are naturally stable.

QUALISOY “is a collaborative effort in the soybean industry to help market the development and availability of healthier soybeans and soy oil, reduce environmental impacts of livestock production through improved soybean meal, and improve the global competitiveness of the U.S. soybean industry” (<http://www.qualisoy.com/>). VISTIVE Gold™ (< 72 percent oleic acid) and Plenish high oleic soybean oils (75 percent oleic acid) provide higher oil stability as compared to regular soybean oils.

The Oklahoma Cooperative Extension Service Bringing the University to You!

The Cooperative Extension Service is the largest, most successful informal educational organization in the world. It is a nationwide system funded and guided by a partnership of federal, state, and local governments that delivers information to help people help themselves through the land-grant university system.

Extension carries out programs in the broad categories of agriculture, natural resources and environment; home economics; 4-H and other youth; and community resource development. Extension staff members live and work among the people they serve to help stimulate and educate Americans to plan ahead and cope with their problems.

Some characteristics of the Cooperative Extension system are:

- The federal, state, and local governments cooperatively share in its financial support and program direction.
- It is administered by the land-grant university as designated by the state legislature through an Extension director.
- Extension programs are nonpolitical, objective, and based on factual information.

- It provides practical, problem-oriented education for people of all ages. It is designated to take the knowledge of the university to those persons who do not or cannot participate in the formal classroom instruction of the university.
- It utilizes research from university, government, and other sources to help people make their own decisions.
- More than a million volunteers help multiply the impact of the Extension professional staff.
- It dispenses no funds to the public.
- It is not a regulatory agency, but it does inform people of regulations and of their options in meeting them.
- Local programs are developed and carried out in full recognition of national problems and goals.
- The Extension staff educates people through personal contacts, meetings, demonstrations, and the mass media.
- Extension has the built-in flexibility to adjust its programs and subject matter to meet new needs. Activities shift from year to year as citizen groups and Extension workers close to the problems advise changes.

Oklahoma State University, in compliance with Title VI and VII of the Civil Rights Act of 1964, Executive Order 11246 as amended, Title IX of the Education Amendments of 1972, Americans with Disabilities Act of 1990, and other federal laws and regulations, does not discriminate on the basis of race, color, national origin, gender, age, religion, disability, or status as a veteran in any of its policies, practices or procedures. This includes but is not limited to admissions, employment, financial aid, and educational services.

Issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Robert E. Whitson, Director of Oklahoma Cooperative Extension Service, Oklahoma State University, Stillwater, Oklahoma. This publication is printed and issued by Oklahoma State University as authorized by the Vice President, Dean, and Director of the Division of Agricultural Sciences and Natural Resources and has been prepared and distributed at a cost of 74 cents per copy. 0617

Low saturated fat content and neutral flavor profile are other advantages of these oils. Trait Enhanced oilseeds are developed by breeders to have reduced levels of polyunsaturates (linolenic and linoleic acids).

Low Trans and Trans Free Fats/Oils Available from Archer Daniels Midland Co.

Novalipid - NovaLipid products contain little to no *trans* fat but provide full functionality and extremely low taste profiles.

Naturally Stable Oils - Canola, cottonseed, sunflower seed, soybean and corn oil provide the opportunity to tailor made blends that will meet the requirements of a broad range of food formulations including baking, frying, sauces, dressings and spraying oil.

Enzymatically Interesterified Oils and Shortenings - These products provide a sharper melting profile and a low-*trans* alternative for baking and frying applications.

Palm Products - Palm oil, palm olein and palm stearin can be used to replace *trans* fat rich partially hydrogenated fats. However, high saturated fat content of some of these products should be considered while formulating food products.

Coconut and Palm Kernel Oil Products - These oils are designed for coatings, fillings, confections, coffee whiteners and other applications that require sharp melting characteristics. Modified forms of these oils, i.e. interesterified, blended, and/or full hydrogenated products provide good options specific applications.

No Trans Alternatives from Bunge North America

UltraBlends Technology - The UltraBlends Technology delivers *trans* fat free products produced without partial hydrogenation and include no palm products. These products, shortenings, produced via an enzymatic interesterification process that does not generate *trans* fats. Bakers margarine and all-purpose, donut frying and icing shortenings produced using UltraBlend Technology are available.

Non-hydrogenated Technology - Non-hydrogenated (NH) technology utilizes non-hydrogenated palm oil and/or palm kernel oil with no *trans* fats. Bakers, cookie, table grade, pastry for laminated dough and roll-in no salt margarines and various butter blends produced using NH technology are available.

Nutra-Clear NT Ultra - Nutra-Clear NT Ultra high oleic canola oil and high oleic soybean oil are designed for frying, roasting and snack spray oil.

Trans Fat Alternatives from Cargill

Clear Valley - Clear Valley line of products contains canola and sunflower oils, zero *trans* fat and low levels of saturated fats. This line consists of the following products:

- Clear Valley CV 65 High Oleic Canola Oil
- Odyssey 90 and 95 High Stability Canola Oil
- Non-GMO High Oleic Canola
- Clear Valley Organic High Oleic Sunflower Oil
- Clear Valley High Oleic Sunflower Oil

- Odyssey 100 High Stability Sunflower Oil
- Clear Valley Expeller Pressed High Oleic Sunflower Oil

Regal Bakery Shortenings

Regal shortenings are designed for baking applications. This line consists of the following products:

- Icing shortening NH (contains palm oil, high oleic canola, oil, mono and diglycerides, poly-sorbate 60)
- All-purpose shortening (contains interesterified soybean oil)

Trans Fat Alternatives from Stratas Foods

Stratas markets branded, custom and private label oil products in the USA and Canada, including frying oils, flavored oils and bakery shortenings. Some examples of *trans* fat free products offered by the company as follows:

- Nutex shortening is designed as liquid cake shortening that contains no tropical fats or hydrogenated oils and has zero grams of *trans* fat per serving.

- Buckeye Palm Flex Bakers Margarine is developed for sweet Goods and Danish, provides butter flavor, heat stability and comes as zero gram *trans* fat formula.
- Golden Sweetex Z Shortening is a zero gram *trans* fat roll-in shortening designed for cakes and icings.

References

For more information about the products listed in this fact sheet, please visit the following websites:

- www.adm.com/en-US/products/food/oils/Pages/default.aspx
- bunge.s3.amazonaws.com/snippets/files/uploads/000/001/167/original/Bunge_no_pho_products.pdf?1434545412
- www.cargill.com/products/food/specialtyoils/cv_sell_sheet.pdf
- www.stratasfoods.com/what-we-do

Table 1. Fatty acid composition of oilseeds (% w/w basis).

Oil Source	Saturated	Mono-unsaturated	Poly-unsaturated	Linoleic Acid	Linolenic Acid
Normal Soybean	14.4	23.3	57.9	51.0	6.8
Normal Canola	7.1	58.9	29.6	20.3	9.3
High Oleic Canola	6.5	72.0	17.1	14.3	2.6
Normal Sunflower	10.3	19.5	65.7	65.7	0.0
Mid Oleic Sunflower	9.0	57.3	29.0	28.7	<0.1
High Oleic Sunflower	9.7	83.6	3.8	3.6	0.2
Corn	12.9	27.6	54.7	53.2	1.2
Peanut	16.9	46.2	32.0	32.0	0.0
Cottonseed	25.9	17.8	51.9	51.5	0.2
Palm	49.3	37.0	9.3	9.1	0.2
Palm Kernel	81.5	11.4	1.6	1.6	0.0
Coconut	86.5	5.8	1.8	1.8	0.0