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Oil Technologists' Association of India (North Zone)

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Editor's desk

Increasing import of refined oil instead of crude oil is the latest worry of Indian edible oil industry. The share of refined oil has touched all time high to 32% of total imported palm oil. Local industries and traders are relying more on imported refined oil because of thin margin of duty difference between crude and refined palm oil. The present duty difference of 7.5 % between crude (12.5 %) and refined (5.0%) palm oil makes hardly any room for profitable processing for small industries. While the palm oil exporting countries' government are keen to protect their finished product producing industries, Indian industries are still asking for such overdue action.

The control imposed on edible oil, oil seeds and pulses in 2014 under essential commodity act 1955, was due to expire on 30 September 2016, increased for a year up to 30 September 2017. The stock limit to these commodities was imposed, in 2014 to curb hoarding, profiteering and unscrupulous trading to ensure adequate supply of these commodities in market.

The Indian edible oil industry and trade is under immense stress due to various national and international issues. Industry leaders and law makers are required to sit together to chalk out a long term strategy to ensure its survival and smooth growth of this vital sector of Indian economy. Otherwise country's dependence on imported edible oil product will increase more and more. Apart from generating huge employment and providing avenue to industrial activities, the Indian edible oil sector act is bridge between rural agrarian economy and urban market. The long term redressal is need of the time.

Yours truly
C S Joshi
Editor

Oil Technologists' Association of India
(North Zone)

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DESIGNER LIPIDS: A MODERN APPROACH FOR FOOD AND NUTRACEUTICAL APPLICATIONS

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Abstract

Generally, structured lipids (SLs) are design for improving nutritional or functional properties and are defined as triacylglycerols (TAG) restructured or modified to change the fatty acid composition and/or their positional distribution in glycerol molecules by chemical or enzymatic processes. SLs may provide the most effective means of delivering desired fatty acids for nutritive or therapeutic purposes and possess desired physical characteristics, chemical properties, and/or nutritional benefits. They can be produced from short-chain, medium-chain, long-chain TAG, and any vegetable or animal fats, through chemical or enzymatic processing. SLs are well known for their various functional properties and have many applications in the food and nutraceutical industries like cocoa butter alternatives, infant formulas, medium-long chain triacylglycerides, monoacylglycerides, diacylglycerides and modified phospholipids etc.

Introduction

With the ability to combine the beneficial characteristics of component fatty acids into 1 triacylglycerol molecule, lipid modification enhances the functional properties of fats and oils which could play important role in food, nutrition, and health applications. Structured lipids are tailor-made fats and oils with improved nutritional or physical properties because of modifications to incorporate new fatty acids or to change the position of existing fatty acids on the glycerol backbone

Component Fatty Acids for Structured Lipids

A variety of fatty acids (Table 1) are used in the synthesis of SLs, taking advantage of the functions and properties of each to maximize the benefits of a given SL. The component fatty acids and their position in the TAG molecule determine the functional and physical properties, the metabolic fate, and the health benefits of an SL. Therefore, careful analysis of the function and metabolism of component fatty acids is merited.

Table 1: Natural occurring saturated and unsaturated fatty acids.

Common Name	***Systematic Name***	***Structural Formula***	***Lipid Numbers***
Butyric acid	Butanoic acid	$CH_3(CH_2)_2COOH$	C4:0
Caproic acid	Hexanoic acid	$CH_3(CH_2)_4COOH$	C6:0
Caprylic acid	Octanoic acid	$CH_3(CH_2)_6COOH$	C8:0
Capric acid	Decanoic acid	$CH_3(CH_2)_8COOH$	C10:0
Lauric acid	Dodecanoic acid	$CH_3(CH_2)_{10}COOH$	C12:0
Myristic acid	Tetradecanoic acid	$CH_3(CH_2)_{12}COOH$	C14:0

Palmitic acid	Hexadecanoic acid	$CH_3(CH_2)_{14}COOH$	C16:0
Stearic acid	Octadecanoic acid	$CH_3(CH_2)_{16}COOH$	C18:0
Oleic acid	*cis*-9-Octadecenoic acid	$CH_3(CH_2)_7CH{=}CH(CH_2)_7COOH$	C18:1
Linoleic acid	*cis, cis*-9,12-Octadecadienoic acid	$CH_3(CH_2)_4CH{=}CHCH_2CH{=}CH(CH_2)_7COOH$	C18:2
α-Linolenic acid	*all*-*cis*-9,12,15-octadecatrienoic acid	$CH_3CH_2CH{=}CHCH_2CH{=}CHCH_2CH{=}$ $CH(CH_2)_7COOH$	C18:3
Arachidic acid	Eicosanoic acid	$CH_3(CH_2)_{18}COOH$	C20:0
Eicosapentaenoic acid	*cis*-5,8,11,14,17-ecosapentaenoic acid	$CH_3CH_2CH{=}CHCH_2CH{=}CHCH_2CH{=}$ $CHCH_2CH{=}CHCH_2CH{=}CH(CH_2)_3COOH$	C20:5
Behenic acid	Docosanoic acid	$CH_3(CH_2)_{20}COOH$	C22:0
Docosahexaenoic acid	*cis*-4,7,10,13,16,19-Docosahexaenoic acid	$CH_3CH_2CH{=}CHCH_2CH{=}CHCH_2CH{=}$ $CHCH_2CH{=}CHCH_2CH{=}CHCH_2CH{=}$ $CH(CH_2)_2COOH$	C22:6
Lignoceric acid	Tetracosanoic acid	$CH_3(CH_2)_{22}COOH$	C24:0

Short chain fatty acids (SCFAs)

Traditional sources of SCFAs include bovine milk and butter fat and are formed when dietary fiber is fermented in the colon. SCFAs range from 2 to 6 carbons long (mainly; Acetic acid, Propionic acid, Butyric acid and Caproic acid) and are primarily absorbed through the portal vein during lipid digestion (Wong et al, 2006). They are also known as volatile fatty acids. Due to their water soluble nature, molecular size, and short chain length, they are more rapidly absorbed in the stomach than other fatty acids. Additionally, SCFAs attached to the sn-3 position of TAGs will be completely hydrolyzed in the lumen of the stomach and small intestine, due to the positional and chain length specificity of human pancreatic gastric lipase. SCFAs have lower heat of combustion than other fatty acids, making them lower in calories. Caloric values of common SCFAs are as follows: C2:0, 3.5 kcal/g; C3:0, 5.0 kcal/g; C4:0, 6.0 kcal/g; and C6:0, 7.5 kcal/g (Akoh, 1998).

Medium chain fatty acids (MCFAs)

Medium-chain triglycerides (MCTs) are triglycerides whose fatty acids have an aliphatic tail of 6–12 carbon atoms and the fatty acids found in MCTs are called medium-chain fatty acids (MCFAs) including Caproic, Caprylic, Capric and Lauric acid (Table 1). The primary sources of MCFAs are coconut and palm kernel oils. MCFAs are preferentially transported via the portal vein to the liver, because of their smaller size and greater solubility compared to LCFAs (Straarup and Hoy, 2000). They are not carnitine-dependent as directly enter into the mitochondria of all tissues (Bell et al, 1997). Additionally, MCFAs are metabolized as rapidly as glucose in the body with little tendency to deposit as stored fat, because they are not readily re-esterified into triacylglycerols. Although MCFAs may be useful in the control of obesity, they can potentially raise serum cholesterol levels. Therefore, it appears that MCFAs are most useful in a structured lipid that combines their inherent mobility, solubility, and ease of metabolism with more healthful polyunsaturated fatty acids (Akoh, 1998).

Long chain fatty acids (LCFAs)

Animal fats, vegetable and marine oils are main source of long chain fatty acids (LCFAs), ranging from C14 to C24 carbon chain (Table 1). Several types of LCFAs exist naturally depending on their source which is shown below.

- Omega-6 fatty acids cannot be synthesized by humans and are therefore considered essential fatty acids (EFAs). Linoleic acid (18:2n-6), found in most vegetable oils and plant seeds, is an EFA that can be desaturated further, and elongated to arachidonic acid (20:4n-6). Arachidonic acid is a precursor for eicosanoid formation.
- Another type of EFA is the omega-3 fatty acid, such as linolenic acid (18:3n-3), which is found in soybean and linseed oils. The n-3 fatty acids are essential in growth and development throughout the human life cycle and should be included in the diet. The n-3 PUFAs inhibit tissue eicosanoid biosynthesis and reduce inflammation. Diets rich in n-3 PUFAs also increase high density lipoprotein (HDL) cholesterol, while decreasing low density lipoprotein (LDL) and very low density lipoprotein (VLDL) cholesterol levels. They are absorbed and metabolized more slowly than either medium or short chain fatty acids; much of the LCFAs may be lost as calcium-fatty acid soap in the feces (Broun et al, 1999).
- Eicosapentaenoic acid, 20:5n- 3 (EPA), and docosahexaenoic acid, 22:6n-3 (DHA), found in fish oil, are other n-3 polyunsaturated fatty acids (PUFAs) of interest in SL production. LCFAs cannot be absorbed or transported in the blood, due to their increased hydrophobic character compared to SCFA and MCFA. Instead they must be first packaged into micelles, and then enter the intestinal cells where chylomicrons are formed. Chylomicrons are secreted into the lymphatic system and ultimately enter the systemic circulation. Carnitine is then required to transport LCFAs into the mitochondria of cells.
- Omega-9 fatty acids, found as oleic acid (18:1n-9) in many vegetable oils, are not EFAs, but play a moderate role in reducing plasma cholesterol in the body.
- Conjugated linoleic acid (CLA), which has been shown to exhibit potent anticancer properties in animal models of carcinogenesis, can also be used for designing SLs. The major dietary source of this important class of PUFA is from the meats and fats of ruminant animals. Commercial sources of food grade quantities of this unusual non-methylene-interrupted fatty acid will be required before the therapeutic benefits are realized in humans (Watkins and German, 1998).

Controlling the positional distribution of component fatty acids in the final TAG is also important. During digestion, TAGs are degraded to sn-2 monoacylglycerols (MAGs) and free fatty acids in the small intestine by pancreatic lipase. The sn-2 MAG and free fatty acids are then absorbed by the enterocytes. In the intestinal mucosa cells, sn-2 MAGs are re-esterified with fatty acids of exogenous or endogenous origin to form new TAGs. These are then packed into chylomicrons and excreted into the lymph. The rate of hydrolysis of TAGs by pancreatic lipase is affected by chain length and unsaturation of the fatty acids at the sn-1 and -3 positions, with medium chain triacylglycerols (MCTs) being degraded faster than long chain triacylglycerols (Straarup and Hoy, 2000).

Processing of Structured Lipids

Chemical Process

This process usually involves hydrolysis of a mixture of MCTs and LCTs, and re-esterification after random mixing of the MCFAs and LCFAs has occurred, by the ester-interchange reaction (Akoh, 1998). Interesterification of oil changes its molecular composition. Oils or fats are mixture of various triacylglycerol molecules having different fatty acids and positional distribution. Treating oils and fats with sodium methoxide as a catalyst at 80 °C causes intermolecule ester exchange, changing the molecular composition, while leaving the fatty acid composition unchanged. As a result, the oil changes its physical properties such as melting point and consistency. Chemical interesterification is inexpensive and easy to scale up but the process has its own limitation like the reaction lacks specificity and offers little or no control over the positional distribution of fatty acids in the final product (Willis and Marangoni, 1999).

Ester-interchange:

R1-CO-OR2 + R3-CO-OR4 ---------- R1-CO-OR4

+R3-CO-OR2

This reaction, catalyzed by alkali metals or metal alkylates, requires high temperatures and anhydrous conditions. In addition to the desired randomized TAGs, a number of unwanted products are also obtained from this reaction and may be difficult to remove (Akoh, 1998).

Enzymatic Process

Lipase, or triacylglycerol (TAG) acylhydrolases (EC 3.1.1.3) is a kind of carboxy esterase which occur widely in nature and are active at the oil-water interface in heterogeneous reaction systems. Under physiological conditions, this enzyme catalyzes hydrolysis of oils and fats, so the biological role of lipase is metabolism of lipids. Interesterification using lipase offer the advantage of greater control over the positional distribution of fatty acids in the final product, due to lipases fatty acid selectivity and regiospecificity. It hydrolyze TAGs to monoacylglycerols, diacylglycerols (DAGs), free fatty acids (FFA), and glycerol. Transesterification is categorized into four subclasses according to the chemical species which react with the ester. Alcoholysis is the reaction with an ester and an alcohol, while acidolysis is the one with an ester and an acid. Interesterification is a reaction between two different esters, where alcohol and acid moiety is swapped. In aminolysis, an ester is reacted with an amine, generating an amide and an alcohol.

Lipases can propagate direct esterification, acidolysis, and alcoholysis reactions (Lee and Akoh, 1998).

Direct esterification:

R1-CO-OH + R-OH----- R1-CO-OR + H20

Acidolysis:

R1-CO-OR + R2-CO-OH -----R2-CO-OR + R1-CO-OH

Alcoholysis:

R-CO-OR1 + R2-OH -----R-CO-OR2 + R1-OH

Esterification and hydrolysis (reverse reaction) reactions occur simultaneously where water must be continuously removed from the reaction medium because it promote excessive hydrolysis result in the accumulation of glycerol, FFAs, MAGs, and DAGs. Therefore, it is necessary to maintain a balance between hydrolysis and esterification in order to increase esterification reactions, while minimizing hydrolysis in order to obtain high conversion rates to products.

Table 2: Some uses, effects, possible methods and desired composition of various structured lipids.

Product Type	***Uses and Effects***	***Potential Methods for Synthesis***	***Desired Composition***
Medium and Long Chain Triacylglycerols (MLCTs)	-Parenteral and enteral feeding -Rapid energy source -Treatments of lipid malabsorption and metabolic syndromes	Acidolysis of long chain TAGs with medium chain FFAs using *sn*-1, 3 specific lipases	*sn*-MLM TAGs
Human Milk Fat (HMF) Analogues	-Infant formulas -Infant formula enriched with ARA, DHA and MCFAs -Increased lipid absorption for infants	Interesterification/acidolysis of high oleic Tags/FFAs and oil with palmitic acid located at the *sn*-2 using *sn*-1, 3 specific lipases	*sn*-OPO TAGs and other TAGs containing ARA, DHA and MCFAs
Cocoa Butter Alternatives	-Chocolates -Confectionaries -Bakery products	Acidolysis of vegetable oils high in oleic acid at the *sn*-2 position and palmitic and stearic FFAs using *sn*-1, 3 specific lipases	*sn*-POP TAGs *sn*-stOSt TAGs *Sn*-POSt TAGs
Reduced Calories Fats and Low *trans*/ *trans* -Free Fats	-Snack foods -*Trans*-free margarines -Sauses -Shortenings -Baked chips -Baked goods -Reduced health implications of *trans* -fatty acids	Interesterification of SCFAs TAGs with LCFAs TAGs Enzymatic interesterification of saturated fats with unsaturated oils	TAGs containing SCFAs TAGs with intermediate properties of substrates

Monoacylglycerols (MAGs)	-Emulsifiers -Emulsifiers with essential fatty acids	Ethanolysis of various TAGs using *sn*-1, 3 specific lipases	2-MAG 2-MAG with essential fatty acids
Diacylglycerols (DAGs)	-Emulsifiers DAG oils -Hypotriglyceridemic effects -Anti-obesity effects	Glycerolysis with FFAs using *sn*-1, 3 specific lipases	*sn*-1, 3 DAG
Structured Phospholipids (PLs)	-Emulsifiers	Hydrolysis of *sn*-2 acyl group using PLA_2 phospholipase	PLs with 1-acyl group attached (lysophospholipids)
	-Phospholipids enriched with n-3 and MCFAs -More bioavailable carrier of fatty acids	Acidolysis/transesterification of various FFAs/ethyl esters with lipases or PLA_1 or PLA_2 phospholipases	PLs enriched with various fatty acids
	-Enzymatic degumming	Hydrolyzing acyl groups of PLs with PLA_1 or PLA_2	Hydratable PLs

Applications of Structured Lipids

Application and uses of some structure lipids are summarized in Table 2 which includes MCFAs, DAGs, EFAs, IFs etc.

TAG-triacylglycerol; FFA-free fatty acids; M-medium chain fatty acid; L-long chain fatty acid; ARA-arachidonic acid; DHA-decosahexaenoic acid; P-palmitic acid; O-oleic acid; St-stearic acid; SCFAs-short chain fatty acids; LCFAs-long chain fatty acids; MCFAs-medium chain fatty acids; PLA1-phospholipase A1; PLA2-phospholipase A2

Infant formulas

Lipids are one of the most important macronutrients for infants and comprise of 50% of the energy in human breast milk. Infant formulas should have composition near to the lipids component found in human milk. Therefore, the fat component of infant formulas should contain the fatty acids, such as MCFAs, linoleic acid, linolenic acid, and PU-FAs in the same position and amount as those found in humanmilk. Human milk is comprised of 20 to 30% palmitic acid, with33% at the sn-2 position (Willis et al, 1998). The fat in most infant formulas is of vegetable origin and tends to have unsaturated fatty acids in the sn-2 position. Therefore, SLs with high proportions of palmitic acid at the sn-2 position would provide a fat with improved absorption capability in infants (Willis et al, 1998). The benefit of using a SL in infant formulas improved fat absorption, improved calcium absorption, softer stools, and a decrease in constipation (Bar-Yoseph et al, 2013).

Cocoa Butter Substitutes

Cocoa butter is a major component of chocolate formulations, and its positional TAG structure allows for specific structural properties. Cocoa butter substitutes have also gained attention due to the uncertainty in cocoa butter supply and the fluctuation of cocoa butter prices. An effective cocoa butter substitute will be accomplished if it can be blended at some ratio with cocoa butter and retain the same properties of cocoa butter such as melting point (32-35 °C), solid fat index, polymorphic behavior, positional composition, and TAG species composition. The TAGs in cocoa butter are more than 70% symmetrical with oleic acid being the major fatty acid at the sn-2 position. The fatty acids in cocoa butter are palmitic (P), oleic (O), and stearic (St) acids, and the major TAG species include POP (14-19 wt/wt %), POSt (36-41 wt/wt %), and StOSt (25-31 wt/wt %) (Yamada et al, 2005). Enzyme technology makes it possible to make cocoa butter substitutes from novel sources by conserving the sn-2 oleic acid in order to mimic the functional properties of cocoa butter. Cocoa butter alternatives can be made using an sn-1,3-specific lipase to incorporate palmitic and stearic FFAs into vegetable oils high in oleic acid at the sn-2 position (Çiftçi et al, 2009).

Reduced Calorie Fats

Reduced calorie fats can be produced by the incorporation of SCFAs (C2:0-C4:0) into TAG molecules to lower caloric content. These types of fats are designed to have similar physical and functional properties of regular fat but with fewer calories. LCFAs typically have caloric values of 9.0 kcal/g. However, acetic (C2:0), propionic (C3:0), and butyric acids (C4:0) have caloric values of 3.5, 5.0, and 6.0 kcal/g, respectively (Akoh, 2008). Very long chain fatty acids of 22 carbons or greater can also be used because they are poorly absorbed in humans (Akoh, 2008). Examples of reduced calorie fats include Benefat from Cultor Food Science and Caprenin from Procter & Gamble, both of which contain 5 kcal/g. Both products are made using chemical interesterification, but Benefat contains chemically interesterified SCFA TAGs (triacetin, tripropionin, and tributyrin) with LCFAs (stearic acid), while Caprenin contains behenic acid (C22:0) with caprylic (C8:0) and capric (C10:0) acids (Rousseau & Marangoni, 2008).

Low-Trans and Trans-Free Fats

Margarines and shortenings usually contain high amounts of trans fatty acids due to the partial hydrogenation process of plant oils. The consumption of trans fat has been associated with increased risk of coronary heart disease, increased low density lipoprotein (LDL) cholesterol, and reduction in high density lipoprotein (HDL) cholesterol (Remig et al, 2010). Recently, the FDA has banned the use of partially hydrogenated oils in processed foods, so the demand for trans-free solutions is increasing. Over the years, there have been efforts to produce trans-free SL alternatives. A successful method involves the use of enzymatic interesterification of saturated fats with unsaturated oils where the product has similar functionality as trans fat. Saturated fats such as coconut oil and palm stearin have been used to produce trans-free margarines with similar properties to traditional margarines (Adhikari et al, 2010).

Enteral and parenteral nutrition

While MCTs have many advantages, a minimum amount of LCT is still necessary to provide EFAs. Physical mixtures of MCTs and LCTs have proven useful in the past for enteral (oral tube feeding) and parenteral (intravenous feeding) nutrition. More recently, structured TAGs comprised of LCFAs and MCFAs have emerged as the preferred alternative to physical mixtures for treatment of patients, although both products provide identical fat contents. Structured lipids comprised of both LCFAs and MCFAs are designed to provide simultaneous delivery of the fatty acids and a slower, more controlled release of the MCFA into the bloodstream (Babayan, 1987).

Conclusion

In recent years, SLs has gained attention because of their various functional properties and have many applications in the food and nutraceutical industries. Enzymatic interesterification is an important process with more advantages due to the specific structures of products over chemical interesterification. Some examples of SLs used today include those that contain MLCTs for rapid energy and essential fatty acids, IFs for proper lipid digestion in infants, cocoa butter alternatives that have similar properties as cocoa butter, reduced calorie fats and oils, low-trans and trans-free margarines to reduce the health implications of trans-fatty acids, MAGs and DAGs as emulsifiers and nutraceuticals, and modified phospholipids as bioavailable sources of physiologically important fatty acids. Therefore, chemical and enzymatic interesterification are promising techniques to provide beneficial lipids for various applications.

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Trade News

France Cancels Tax Hike on Palm Oil

Indonesia threatened that it would not buy the military Airbus A 400M if the biodiversity law was adopted.

The French Government has decided to scrap any additional tax on palm oil for use in food products. The move was welcomed by the Malaysian Palm Oil Council, which said that the additional tax "would have put thousands of small farmers out of work." The organization urged the French Government to drop "once and for all" what it viewed as an unfair tax campaign against palm oil.

Tax on palm oil has been an ongoing question first addressed in 2012 amid environmental concerns and discussed by the Senate and the National Assembly — the lawmakers responsible for the final decision.

Dubbed the "Nutella tax" because of the French love of the Italian chocolate spread, the initial plan applied to palm oil would have raised taxes from €100 per ton to €300 ($326) per year from 2017. It would have meant an increase to €500 per ton in 2018, 700 euros per ton in 2019 and €900 per ton in 2020.

However, strong protests from Malaysia and Indonesia — the two largest producers of palm oil — caused France's National Assembly to approve the levy of a gradual surtax starting at €30 ($34) in 2017, €50 in 2018 and €90 in 2020, a considerable reduction from the origin proposition.

Palm oil is one of the least taxed vegetable oils in France. However, the new diversity bill in which the tax on palm oil was included was not approved by the National Assembly in June 2016 which meant that the additional tax had been scrapped altogether. France's Secretary of State told Parliament that there was some legal uncertainty concerning the law which focused on only one type of vegetable oil.

The French daily publication Le Dauphine reported that it was a story of "a battle of diplomatic and commercial lobbying." The paper said that Indonesia threatened that it would not buy the proposed military Airbus A 400M if the biodiversity law was adopted.

Indonesia's defense minister told Reuters in May that the country planned to buy some military transport aircraft. Minister Ryamizard Ryacudu said: "I have a plan to buy A400s from Europe … but just a small number. There is no need to buy many." Indeed, France's economy would suffer a blow should the threat be carried out.

Environmental protection and consumers groups worldwide remain concerned about the destruction of forests and the negative health implications of palm oil.

Courtesy: Olive Oil Times

Waitrose to Sell Algae-Fed Chicken Containing Healthy Omega 3

UK - Supermarket chain Waitrose has announced that it will soon be selling chicken as a source of Omega 3 fatty acids, using birds produced by Moy Park in Northern Ireland.

Omega 3s are polyunsaturated fatty acids which, as a key part of a balanced diet, help to maintain normal heart, brain and vision function.

Research undertaken in 2013 showed that people with the highest levels of Omega 3 had a 40 per cent reduction in cardiovascular related deaths compared to people with the lowest levels, Waitrose said. Optimum health benefits are obtained from a daily intake of 250mg of Omega 3 fatty acids as part of a healthy balanced diet and lifestyle.

However, research suggests that only 23 per cent of the UK's adult population consumes the recommended intake, generally classified as at least one portion of oily fish per week.

Waitrose said the chicken is enriched by feeding the birds on a diet containing an algae naturally rich in omega 3. The taste and appearance of the chicken is the same as birds reared on a conventional diet.

The new product is the result of partnership between Waitrose, Moy Park and animal nutrition specialist Devenish Nutrition, and took a decade to bring to market. It aims to help children in particular, who Waitrose said often do not like oily fish.

Heather Jenkins, Waitrose's Agricultural Director, said: "Our research is showing that this nutritional breakthrough has the potential to have a significant impact on health. What's exciting is that it's improving the nutritional content of something which customers already consume frequently as part of their diets."

Justin Coleman, Moy Park Agriculture Development Manager, said: "Food and farming innovation are important focus areas for Moy Park and we are proud to be the first poultry company in the UK to produce chicken enriched with Omega 3. Including Omega 3 in the chickens' natural diet makes this already healthy food even healthier."

Waitrose said initial trials demonstrated that people eating enriched chicken for five weeks have increased levels of Omega 3 polyunsaturated fatty acids and see measurable effects on their cardiovascular health.

Initial testing was carried out on 30 healthy participants whose Omega 3 levels were measured after one, three and five weeks of eating three servings per week of Omega 3 enriched chicken meat. On average participants saw their levels of Omega 3s increase by 12 per cent.

A total of 10 different new products, including whole chickens, breast fillets and thigh meat will go on sale from 15 June, priced from £3.59 per kilo.

Courtesy: The Poultry Site News Desk

World's Largest Olive Oil Producer Pledges 'Higher Standards and Transparency'

After the judgement in June that imposed a fine of €300.000 for unfair business practices regarding its olive oil brands Bertolli, Carapelli and Sasso, Deoleo Italia said it will renew a commitment to quality and higher standards.

"We take note of the Italian Antitrust Authority decision that took into consideration the company's new, upgraded quality standards and processes," the world's largest olive oil producer said in a statement. "Moreover, we confirm our commitment to work collaboratively and transparently with the Italian authorities."

The pledge is now presented on a dedicated website and follows an advertising campaign in leading Italian newspapers, that declared that the maker of Bertolli, Carapelli, Sasso and Carbonell brands wanted to "renew the promise of quality and transparency" to consumers.

Deoleo pointed out that its new management team "is expressly focused on elevating quality and transparency standards, above and beyond global industry standards," and is concurrently "collaborating with the entire sector to improve the productivity of the Italian Olive Oil industry and Italian brands worldwide."

It has developed the Quality and Transparency Manifesto that establishes "higher standards" for all of its extra virgin products through six commitment measures:

- The selection of the best olive oils (anchored in stricter procedures for suppliers' accreditation)
- More restrictive physical-chemical parameters than those required under EU law
- Exclusive blending of 100% extra virgin olive oils
- Utilization of dark green bottles to help safeguard product quality
- Improved labels with full details about products
- Traceability for every bottle of extra-virgin olive oil

The company said the first three measures "refer to product quality and raw material standards already in place in its production plants as of the end of 2015, while the last three measures will be fully implemented for all Deoleo extra virgin olive oil products by the end of 2016."

The note referred to "independent experts," which were recently employed by the company to conduct a comprehensive assessment of internal quality processes, in order to ensure the higher standards.

The company said its quality procedures are among the most developed in the olive oil industry and cover the entire product cycle from the selection of raw materials to the products in stores.

Along with its renewed commitment, Deoleo announced the recent appointment of Anna Cane as global quality and development director and Giovanni Sacripante, the former general manager at EXPO Milano 2015, as general manager at Deoleo Italia.

"Quality and consumer trust of our products are what we value most," the company said. "These measures are the culmination of Deoleo's unwavering commitment to both the industry and consumers."

Courtesy: olive oil Times

Olive oil waste yields molecules useful in chemical and food industries

Scientists have found a way to turn waste byproducts from the olive oil production process into bio surfactants and monoglycerides, molecules immensely useful to the chemical and food industries.

Bio surfactants and monoglycerides are surface active agents, or surfactants -- part oil-soluble component, part water-soluble component. Surfactants are used to lower surface and interfacial tension between two liquids or between a liquid and a solid. They can serve as a barrier between oil and water, or to encourage emulsification.

Alpeorujo is the main waste byproduct of one of the most popular two-phase methods of olive oil extraction. The olive oil industry in Spain produces massive amounts of it, which poses a serious pollution problem for the environment.

Scientists and policy makers in Spain and elsewhere have struggled to find a strong secondary market for alpeorujo -- a way to lessen the burden of waste collection and disposal in olive oil-producing regions.

Currently, most alpeorujo is used to make biofuels, but the process isn't all that efficient or lucrative. The new research promises an economically competitive recycling process.

When fermented along with bio surfactant -producing microorganisms, like Bacillus subtilis and Pseudomonas aeruginosa, the carbon-rich alpeorujo successfully fueled the synthesis of valuable surfactants.

It's the first time alpeorujo has been used to produce an eco-friendly surfactant of biological origin -- a biosurficant. Researchers believe the new process can produce bio surfactants more cheaply than current production methods. Scientists detailed the breakthrough in the journal Bio resource Technology.

Courtesy: Science News

EU approves Monsanto, Bayer genetically modified soybeans

The European Commission approved imports of Monsanto's Roundup Ready 2 Xtend genetically modified soybean variety, after months of delays that had derailed the U.S. seed giant's product launch this spring.

The decision now clears the way for widespread planting next season and removes a hurdle for North American farmers and grain traders, who have to keep close track of unapproved biotech traits that can disrupt trade. Top importer China approved the soybeans earlier this year.

U.S. grain trader and processor Archer Daniels Midland Co told Reuters on Friday its elevators and processing plants will now accept the Xtend soybean variety. Rivals Cargill Inc [CARG.UL], Bunge Ltd and CHS Inc, which had also refused to accept the variety without EU import approval, could not be immediately reached for comment.

The EU is the second largest importer of soybeans and its approval is not expected to have a major impact on merger talks by German suitor Bayer AG, whose sweetened $64-billion buyout offer of Monsanto was rejected last week, as it had been widely anticipated, analysts said on Friday.

"It would have been a big deal if it hadn't been approved, but this was the expected outcome, although it took longer than anyone thought," said Bernstein analyst Jonas Oxgaard.

Still, the approval marks a key victory for Monsanto in the wake of months of regulatory delays over this launch, and swirling controversy over whether glyphosate, the chemical in its popular Roundup herbicide, is carcinogenic.

Monsanto expects Roundup Ready 2 Xtend soybeans, designed to tolerate applications of glyphosate and dicamba weed killers, to be planted on 15 million acres next spring and 55 million acres by 2019. The company is still waiting the U.S. Environmental Protection Agency to approve dicamba use on crops.

The European Commission also approved a Bayer CropScience soybean variety. The EU executive branch took action after EU member states failed to reach an agreement on whether to license them.

The approval will allow these GMO soybeans to be used in food or animal feed, but not for planting within the EU.

"Any products produced from these GMOs will be subject to the EU's strict labeling and traceability rules," the European Commission said in a statement.

The EU imports tens of million tonnes of GMO crops and products every year for use in animal feed.

The authorizations, which cover Monsanto's soybean MON 87708 x MON 89788 and soybean MON 87705 x MON 89788 and soybean FG 72 of Bayer's Crop Science division, will be valid for 10 years.

Monsanto shares were little changed on Friday at $106.07.

Courtesy: Commodities

THIS STUDY 40 YEARS AGO COULD HAVE RESHAPED THE AMERICAN DIET. BUT IT WAS NEVER FULLY PUBLISHED.

It was one of the largest, most rigorous experiments ever conducted on an important diet question: How do fatty foods affect our health? Yet it took more than 40 years — that is, until today — for a clear picture of the results to reach the public.

The fuller results appeared Tuesday in BMJ, a medical journal, featuring some never-before-published data. Collectively, the fuller results undermine the conventional wisdom regarding dietary fat that has persisted for decades and is still enshrined in influential publications such as the U.S. government's Dietary Guidelines for Americans. But the long-belated saga of the Minnesota Coronary Experiment may also make a broader point about how science gets done: it suggests just how difficult it can be for new evidence to see the light of day when it contradicts widely held theories.

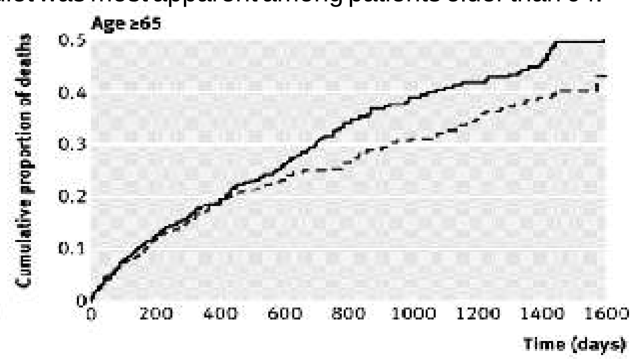
The story begins in the late 1960s and early ’70s, when researchers in Minnesota engaged thousands of institutionalized mental patients to compare the effects of two diets. One group of patients was fed a diet intended to lower blood cholesterol and reduce heart disease. It contained less saturated fat, less cholesterol and more vegetable oil. The other group was fed a more typical American diet.

Just as researchers expected, the special diet reduced blood cholesterol in patients. And while the special diet didn’t seem to have any effect on heart disease, researchers said they suspected that a benefit would have appeared if the experiment had gone on longer.

There was “a favorable trend,” they wrote, for younger patients.

Today, the principles of that special diet — less saturated fat, more vegetable oils — are recommended by the Dietary Guidelines for Americans, the government’s official diet advice book. Yet the fuller accounting of the Minnesota data indicates that the advice is, at best, unsupported by the massive trial. In fact, it appears to show just the opposite: Patients who lowered their cholesterol, presumably because of the special diet, actually suffered more heart-related deaths than those who did not.

The higher rate of mortality for patients on the special diet was most apparent among patients older than 64.



The new researchers, led by investigators from the National Institutes of Health and the University of North Carolina, conclude that the absence of the data over the past 40 years or so may have led to a misunderstanding of this key dietary issue.

“Incomplete publication has contributed to the overestimation of benefits and underestimation of potential risks” of the special diet, they wrote.

“Had this research been published 40 years ago, it might have changed the trajectory of diet-heart research and recommendations” said Daisy Zamora, a researcher at UNC and a lead author of the study.

The new research drew quick criticism, however, especially from experts who have been prominent in the campaign against saturated fats.

"The bottom line is that this report adds no useful new information and is irrelevant to current dietary recommendations that emphasize replacing saturated fat with polyunsaturated fat," Walter Willett, chair of the nutrition department at Harvard University, said in a blog post from the school. "Many lines of evidence support this conclusion."

He characterized the new analysis of the old experiment as "an interesting historical footnote."

The new research will agitate the debate over one of the most controversial questions in all of nutrition: Does the consumption of saturated fats —the ones characteristic of meat and dairy products — contribute to heart disease?

It is, without doubt, an important question. Heart disease is the leading cause of mortality in the United States, and Americans eat a lot of red meat and dairy foods.

The federal government has long blamed saturated fats for health troubles, and it continues — through the Dietary Guidelines for Americans — to recommend that people limit their intake.

Indeed, the Dietary Guidelines continue to embrace the principles advocated by the Minnesota researchers from 40 years ago. The book advises Americans to limit their intake of saturated fats and to replace them at least in part with oils, just as the Minnesota experimenters did 40 years ago. More specifically, it advises Americans to consume about five teaspoons (27 grams) of oils per day, mentioning canola, corn, olive, peanut, safflower, soybean and sunflower oils.

“Oils should replace solid fats rather than being added to the diet,” it advises.

But the idea that spurning saturated fat will, by itself, make people healthier has never been fully proved, and in recent years repeated clinical trials and large-scale observational studies have produced evidence to the contrary. Whether cutting saturated fats out of your diet will make you healthier depends, of course, on what you replace them with.

“What this research implies is that there is not enough evidence to draw strong conclusions about the health effects of vegetable oils” Christopher Ramsden, a medical investigator at NIH and a lead author of the study, said in an interview. While urging caution in drawing conclusions about the new analysis, he said the research suggested saturated fats "may not be as bad as originally thought."

Ramsden and colleagues discovered the missing data during their research examining the potentially harmful effects of linoleic acid — a key constituent of most vegetable oils — on human health. Preliminary research suggests a link between linoleic acid and diseases such as chronic pain, Ramsden said, and humans have been consuming it in larger quantities than their bodies may be prepared for. Before the advent of agriculture, humans got 2 to 3 percent of their calories from linoleic acid, according to the new paper; today most Americans, awash in cooking oils and oils added to snack foods, get much more.

It's not exactly clear why the full set of data from the Minnesota experiment was never published.

As research efforts on diets go, the study was rigorous. Funded by the U.S. Public Health Service and the National Heart Institute, it involved more than 9,000 patients who were randomly assigned to one of the two diets. Detailed measurements of blood cholesterol and other indexes of health were recorded.

Willett, the Harvard nutritionist, faulted the experiment because many of the patients were on the special diets for relatively brief periods - many were being released from the mental institutions. But about a quarter of the patients remained on the diet for a year or longer, and why such an apparently well-done study received so little fanfare is mystifying to some.

The results of the study were never touted by the investigators. Partial results were presented at an American Heart Association conference in 1975, and it wasn't until 1989 that some of the results were published, appearing in a medical journal known as Arteriosclerosis.

The lead investigators of the trial, noted scientists Ancel Keys and Ivan Frantz, are deceased.

Steven Broste, now a retired biostatistician, was then a student at the University of Minnesota and used the full set of data for his master's thesis in 1981. He interacted with the researchers. Part of the problem, Broste suggested in an interview, may have been limits on statistical methods at the time. Computer software for statistics wasn't as readily available as it is today. So, at the time of the study, it wasn't as easy to know how significant the data was. Broste completed his thesis several years after the last patients had left the trial, but it was not published in a journal.

Broste also suggested that at least part of the reason for the incomplete publication of the data might have been human nature. The Minnesota investigators had a theory that they believed in — that reducing blood cholesterol would make people healthier. Indeed, the idea was widespread and would soon be adopted by the federal government in the first dietary recommendations. So when the data they collected from the mental patients conflicted with this theory, the scientists may have been reluctant to believe what their experiment had turned up.

“The results flew in the face of what people believed at the time,” said Broste. “Everyone thought cholesterol was the culprit. This theory was so widely held and so firmly believed — and then it wasn’t borne out by the data. The question then became: Was it a bad theory? Or was it bad data? ... My perception was they were hung up trying to understand the results.”

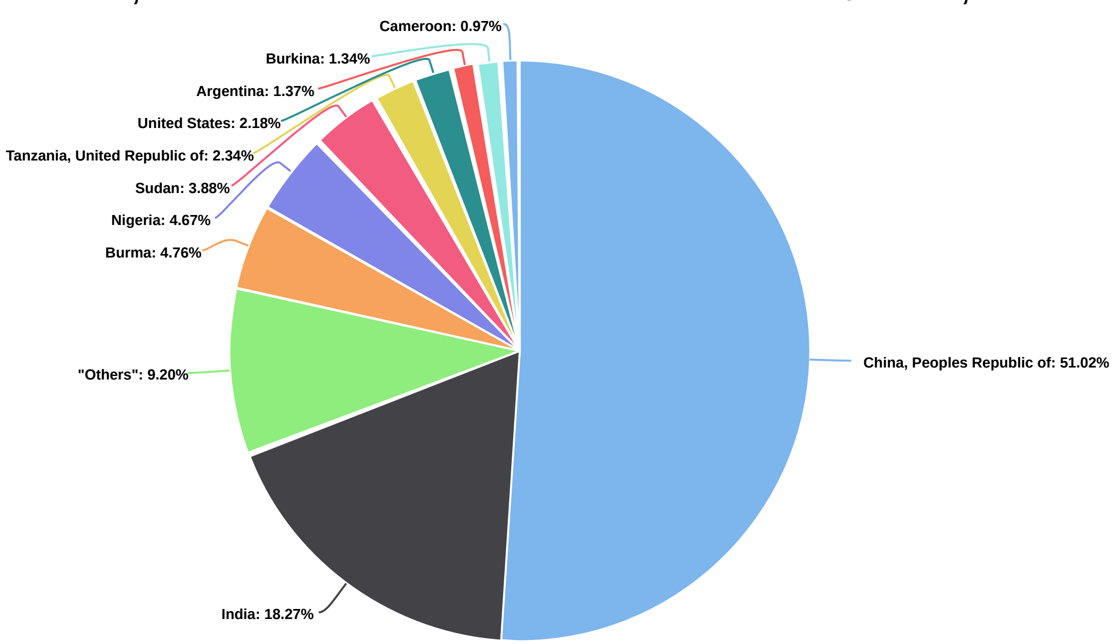
Courtesy: The Washington Post

Important Figures

World Production - Oil Peanut – Main Countries in 2016/2017 MY, 1000MT

Attribute	2016/17, Sep '16	Month Change	Year Change	2016/17, Aug '16	2015/16	2014/15
Production	5,676	+54 (+0.96%)	+247 (+4.54%)	5,622	5,429	5,537
Beginning Stocks	59	-2 (-3.27%)	-16 (-21.33%)	61	75	88
Imports	263	0.0 (0.0%)	-13 (-4.71%)	263	276	245
Total Supply	5,998	+52 (+0.87%)	+218 (+3.77%)	5,946	5,780	5,870
Exports	226	+1 (+0.44%)	-19 (-7.75%)	225	245	245
Domestic Consumption	5,680	+27 (+0.47%)	+204 (+3.72%)	5,653	5,476	5,550
Industrial Dom. Cons.	11	0.0 (0.0%)	0.0 (0.0%)	11	11	11
Food Use Dom. Cons.	5,669	+27 (+0.47%)	+204 (+3.73%)	5,642	5,465	5,539
Feed Waste Dom. Cons.	-	-	-	-	-	-
Crush	17,548	+160 (+0.92%)	+760 (+4.52%)	17,388	16,788	17,082
Total Distribution	5,998	+52 (+0.87%)	+218 (+3.77%)	5,946	5,780	5,870
Ending Stocks	92	+24 (+35.29%)	+33 (+55.93%)	68	59	75
Extr. Rate, 999.9999	-	-	-	-	-	-

Oil, Peanut. World. Production. Main countries in 2016/2017MY, `000 MT



S.N.	Country	Sep '16	Aug '16	2015/16	2014/15	2013/14
1	China, Peoples Republic of	2,896	2,896	2,800	2,686	2,787
2	India	1,037	986	918	1,156	1,292
3	Burma	270	270	270	270	270
4	Nigeria	265	265	265	265	229
5	Sudan	220	220	220	190	190
6	Tanzania, United Republic of	133	133	133	133	133
7	United States	124	121	103	97	95
8	Argentina	78	78	72	84	59
9	Burkina	76	76	76	75	79
10	Cameroon	55	55	55	55	55

Oil, Peanut. China, Peoples Republic of. `000 MT

Attribute	2016/17, Sep '16	Month Change	Year Change	2016/17, Aug '16	2015/16	2014/15
Production	2,896	0.0 (0.0%)	+96 (+3.42%)	2,896	2,800	2,686
Imports	150	0.0 (0.0%)	0.0 (0.0%)	150	150	141
Total Supply	3,046	0.0 (0.0%)	+96 (+3.25%)	3,046	2,950	2,827
Exports	6	0.0 (0.0%)	-4 (-40.00%)	6	10	8
Domestic Consumption	3,040	0.0 (0.0%)	+100 (+3.40%)	3,040	2,940	2,819
Food Use Dom. Cons.	3,040	0.0 (0.0%)	+100 (+3.40%)	3,040	2,940	2,819
Crush	9,050	0.0 (0.0%)	+300 (+3.42%)	9,050	8,750	8,394
Total Distribution	3,046	0.0 (0.0%)	+96 (+3.25%)	3,046	2,950	2,827
Extr. Rate, 999.9999	-	-	-	-	-	-

Oil, Peanut. India. `000 MT

Attribute	2016/17, Sep '16	Month Change	Year Change	2016/17, Aug '16	2015/16	2014/15
Production	1,037	+51 (+5.17%)	+119 (+12.96%)	986	918	1,156
Beginning Stocks	27	0.0 (0.0%)	-2 (-6.89%)	27	29	30
Imports	-	-	-	-	-	-
Total Supply	1,064	+51 (+5.03%)	+117 (+12.35%)	1,013	947	1,186
Exports	20	0.0 (0.0%)	0.0 (0.0%)	20	20	15
Domestic Consumption	985	+25 (+2.60%)	+85 (+9.44%)	960	900	1,142
Industrial Dom. Cons.	10	0.0 (0.0%)	0.0 (0.0%)	10	10	10
Food Use Dom. Cons.	975	+25 (+2.63%)	+85 (+9.55%)	950	890	1,132
Crush	3,050	+150 (+5.17%)	+350 (+12.96%)	2,900	2,700	3,400
Total Distribution	1,064	+51 (+5.03%)	+117 (+12.35%)	1,013	947	1,186
Ending Stocks	59	+26 (+78.78%)	+32 (+118.51%)	33	27	29
Extr. Rate, 999.9999	-	-	-	-	-	-

Oil, Peanut. Burma. `000 MT

Attribute	2016/17, Sep '16	Month Change	Year Change	2016/17, Aug '16	2015/16	2014/15
Production	270	0.0 (0.0%)	0.0 (0.0%)	270	270	270
Beginning Stocks	12	0.0 (0.0%)	0.0 (0.0%)	12	12	12
Total Supply	282	0.0 (0.0%)	0.0 (0.0%)	282	282	282
Domestic Consumption	270	0.0 (0.0%)	0.0 (0.0%)	270	270	270
Food Use Dom. Cons.	270	0.0 (0.0%)	0.0 (0.0%)	270	270	270
Crush	850	0.0 (0.0%)	0.0 (0.0%)	850	850	850
Total Distribution	282	0.0 (0.0%)	0.0 (0.0%)	282	282	282
Ending Stocks	12	0.0 (0.0%)	0.0 (0.0%)	12	12	12
Extr. Rate, 999.9999	-	-	-	-	-	-

Oil, Peanut. Nigeria. `000 MT

Attribute	2016/17, Sep '16	Month Change	Year Change	2016/17, Aug '16	2015/16	2014/15
Production	265	0.0 (0.0%)	0.0 (0.0%)	265	265	265
Imports	1	0.0 (0.0%)	0.0 (0.0%)	1	1	1
Total Supply	266	0.0 (0.0%)	0.0 (0.0%)	266	266	266
Exports	3	0.0 (0.0%)	0.0 (0.0%)	3	3	3
Domestic Consumption	263	0.0 (0.0%)	0.0 (0.0%)	263	263	263
Industrial Dom. Cons.	-	-	-	-	-	-
Food Use Dom. Cons.	263	0.0 (0.0%)	0.0 (0.0%)	263	263	263
Crush	750	0.0 (0.0%)	0.0 (0.0%)	750	750	750
Total Distribution	266	0.0 (0.0%)	0.0 (0.0%)	266	266	266
Extr. Rate, 999.9999	-	-	-	-	-	-

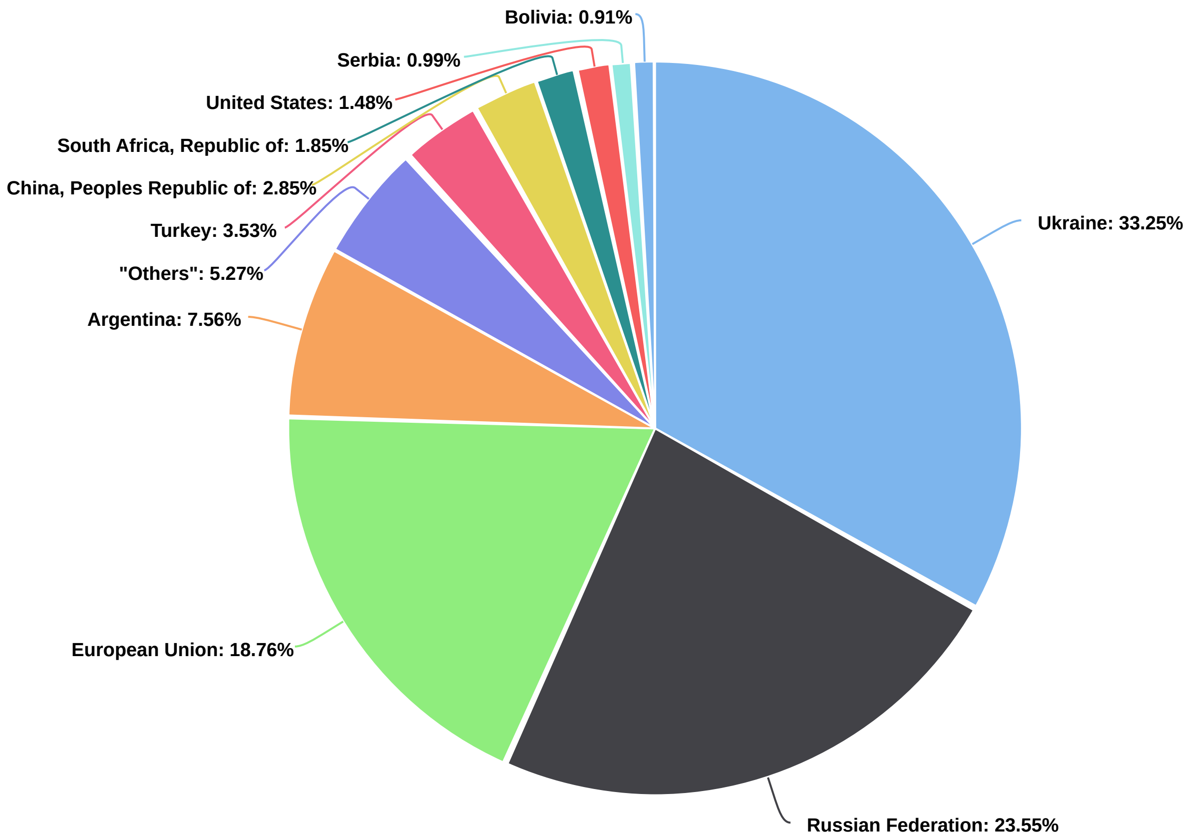
Oil, Peanut. Sudan. `000 MT

Attribute	2016/17, Sep '16	Month Change	Year Change	2016/17, Aug '16	2015/16	2014/15
Production	220	0.0 (0.0%)	0.0 (0.0%)	220	220	190
Beginning Stocks	3	0.0 (0.0%)	-	3	-	10
Total Supply	223	0.0 (0.0%)	+3 (+1.36%)	223	220	200
Exports	5	0.0 (0.0%)	0.0 (0.0%)	5	5	5
Domestic Consumption	218	0.0 (0.0%)	+6 (+2.83%)	218	212	195
Food Use Dom. Cons.	218	0.0 (0.0%)	+6 (+2.83%)	218	212	195
Crush	700	0.0 (0.0%)	0.0 (0.0%)	700	700	600
Total Distribution	223	0.0 (0.0%)	+3 (+1.36%)	223	220	200
Ending Stocks	-	-	-	-	3	-
Extr. Rate, 999.9999	-	-	-	-	-	-

Oil, Sunflower seed. World. `000 MT

Attribute	2016/17, Aug '16	Month Change	Year Change	2016/17, Jul '16	2015/16	2014/15
Production	16,554	+313 (+1.92%)	+1,424 (+9.41%)	16,241	15,130	14,914
Beginning Stocks	1,353	-77 (-5.38%)	-615 (-31.25%)	1,430	1,968	2,476
Imports	7,691	+110 (+1.45%)	+536 (+7.49%)	7,581	7,155	6,136
Total Supply	25,598	+346 (+1.37%)	+1,345 (+5.54%)	25,252	24,253	23,526
Exports	8,778	+360 (+4.27%)	+887 (+11.24%)	8,418	7,891	7,393
Domestic Consumption	15,556	+65 (+0.41%)	+547 (+3.64%)	15,491	15,009	14,165
Industrial Dom. Cons.	662	0.0 (0.0%)	+10 (+1.53%)	662	652	662
Food Use Dom. Cons.	14,819	+65 (+0.44%)	+535 (+3.74%)	14,754	14,284	13,432
Feed Waste Dom. Cons.	75	0.0 (0.0%)	+2 (+2.73%)	75	73	71
Crush	39,650	+745 (+1.91%)	+3,390 (+9.34%)	38,905	36,260	35,760
Total Distribution	25,598	+346 (+1.37%)	+1,345 (+5.54%)	25,252	24,253	23,526
Ending Stocks	1,264	-79 (-5.88%)	-89 (-6.57%)	1,343	1,353	1,968
Extr. Rate, 999.9999	1	0.0 (0.0%)	0.0 (0.0%)	1	1	-

Oil, Sunflowerseed. World. Production. Main countries in 2016/2017MY, `000 MT



S.N.	Country	Aug '16	Jul '16	2015/16	2014/15	2013/14
1	Ukraine	5,541	5,372	4,716	4,357	4,759
2	Russian Federation	3,924	3,738	3,530	3,366	3,593
3	European Union	3,127	3,127	2,958	3,232	3,196
4	Argentina	1,180	1,180	1,220	1,151	934
5	Turkey	589	589	593	731	851
6	China, Peoples Republic of	475	475	466	466	481
7	South Africa, Republic of	308	308	325	298	347
8	United States	247	247	222	147	197
9	Serbia	165	165	161	161	123
10	Bolivia	151	151	142	123	113

Oil, Sunflower seed. Ukraine. `000 MT

Attribute	2016/17, Aug '16	Month Change	Year Change	2016/17, Jul '16	2015/16	2014/15
Production	5,541	+169 (+3.14%)	+825 (+17.49%)	5,372	4,716	4,357
Beginning Stocks	63	-1 (-1.56%)	-92 (-59.35%)	64	155	174
Imports	2	0.0 (0.0%)	0.0 (0.0%)	2	2	2
Total Supply	5,606	+168 (+3.08%)	+733 (+15.04%)	5,438	4,873	4,533
Exports	4,950	+150 (+3.12%)	+650 (+15.11%)	4,800	4,300	3,868
Domestic Consumption	520	0.0 (0.0%)	+10 (+1.96%)	520	510	510
Industrial Dom. Cons.	30	0.0 (0.0%)	0.0 (0.0%)	30	30	30
Food Use Dom. Cons.	490	0.0 (0.0%)	+10 (+2.08%)	490	480	480
Feed Waste Dom. Cons.	-	-	-	-	-	-
Crush	13,100	+400 (+3.14%)	+1,950 (+17.48%)	12,700	11,150	10,300
Total Distribution	5,606	+168 (+3.08%)	+733 (+15.04%)	5,438	4,873	4,533
Ending Stocks	136	+18 (+15.25%)	+73 (+115.87%)	118	63	155
Extr. Rate, 999.9999	-	-	-	-	-	-

Oil, Sunflower seed. Russian Federation. `000 MT

Attribute	2016/17, Aug '16	Month Change	Year Change	2016/17, Jul '16	2015/16	2014/15
Production	3,924	+186 (+4.97%)	+394 (+11.16%)	3,738	3,530	3,366
Beginning Stocks	61	0.0 (0.0%)	+5 (+8.92%)	61	56	87
Imports	10	0.0 (0.0%)	+5 (+100.00%)	10	5	3
Total Supply	3,995	+186 (+4.88%)	+404 (+11.25%)	3,809	3,591	3,456
Exports	1,850	+200 (+12.12%)	+300 (+19.35%)	1,650	1,550	1,450
Domestic Consumption	2,060	0.0 (0.0%)	+80 (+4.04%)	2,060	1,980	1,950
Industrial Dom. Cons.	380	0.0 (0.0%)	+10 (+2.70%)	380	370	370
Food Use Dom. Cons.	1,650	0.0 (0.0%)	+70 (+4.43%)	1,650	1,580	1,550
Feed Waste Dom. Cons.	30	0.0 (0.0%)	0.0 (0.0%)	30	30	30
Crush	9,500	+450 (+4.97%)	+950 (+11.11%)	9,050	8,550	8,150
Total Distribution	3,995	+186 (+4.88%)	+404 (+11.25%)	3,809	3,591	3,456
Ending Stocks	85	-14 (-14.14%)	+24 (+39.34%)	99	61	56
Extr. Rate, 999.9999	-	-	-	-	-	-

Oil, Sunflowerseed. European Union. `000 MT

Attribute	2016/17, Aug '16	Month Change	Year Change	2016/17, Jul '16	2015/16	2014/15
Production	3,127	0.0 (0.0%)	+169 (+5.71%)	3,127	2,958	3,232
Beginning Stocks	193	0.0 (0.0%)	-32 (-14.22%)	193	225	289
Imports	1,300	0.0 (0.0%)	+150 (+13.04%)	1,300	1,150	823
Total Supply	4,620	0.0 (0.0%)	+287 (+6.62%)	4,620	4,333	4,344
Exports	350	0.0 (0.0%)	0.0 (0.0%)	350	350	419
Domestic Consumption	4,090	0.0 (0.0%)	+300 (+7.91%)	4,090	3,790	3,700
Industrial Dom. Cons.	230	0.0 (0.0%)	0.0 (0.0%)	230	230	240
Food Use Dom. Cons.	3,850	0.0 (0.0%)	+300 (+8.45%)	3,850	3,550	3,450
Feed Waste Dom. Cons.	10	0.0 (0.0%)	0.0 (0.0%)	10	10	10
Crush	7,400	0.0 (0.0%)	+400 (+5.71%)	7,400	7,000	7,650
Total Distribution	4,620	0.0 (0.0%)	+287 (+6.62%)	4,620	4,333	4,344
Ending Stocks	180	0.0 (0.0%)	-13 (-6.73%)	180	193	225

Oil, Sunflower seed. Argentina. `000 MT

Attribute	2016/17, Aug '16	Month Change	Year Change	2016/17, Jul '16	2015/16	2014/15
Production	1,180	0.0 (0.0%)	-40 (-3.27%)	1,180	1,220	1,151
Beginning Stocks	274	-60 (-17.96%)	-105 (-27.70%)	334	379	426
Imports	-	-	-	-	-	-
Total Supply	1,454	-60 (-3.96%)	-145 (-9.06%)	1,514	1,599	1,577
Exports	550	0.0 (0.0%)	-50 (-8.33%)	550	600	502
Domestic Consumption	744	0.0 (0.0%)	+19 (+2.62%)	744	725	696
Industrial Dom. Cons.	2	0.0 (0.0%)	0.0 (0.0%)	2	2	2
Food Use Dom. Cons.	717	0.0 (0.0%)	+17 (+2.42%)	717	700	673
Feed Waste Dom. Cons.	25	0.0 (0.0%)	+2 (+8.69%)	25	23	21
Crush	2,800	0.0 (0.0%)	-110 (-3.78%)	2,800	2,910	2,743
Total Distribution	1,454	-60 (-3.96%)	-145 (-9.06%)	1,514	1,599	1,577
Ending Stocks	160	-60 (-27.27%)	-114 (-41.60%)	220	274	379
Extr. Rate, 999.9999	-	-	-	-	-	-

Oil, Sunflower seed. Turkey. `000 MT

Attribute	2016/17, Aug '16	Month Change	Year Change	2016/17, Jul '16	2015/16	2014/15
Production	589	0.0 (0.0%)	-4 (-0.67%)	589	593	731
Beginning Stocks	149	0.0 (0.0%)	-182 (-54.98%)	149	331	398
Imports	990	0.0 (0.0%)	+210 (+26.92%)	990	780	814
Total Supply	1,728	0.0 (0.0%)	+24 (+1.40%)	1,728	1,704	1,943
Exports	550	0.0 (0.0%)	0.0 (0.0%)	550	550	632
Domestic Consumption	1,030	0.0 (0.0%)	+25 (+2.48%)	1,030	1,005	980
Industrial Dom. Cons.	20	0.0 (0.0%)	0.0 (0.0%)	20	20	20
Food Use Dom. Cons.	1,000	0.0 (0.0%)	+25 (+2.56%)	1,000	975	950
Feed Waste Dom. Cons.	10	0.0 (0.0%)	0.0 (0.0%)	10	10	10
Crush	1,370	0.0 (0.0%)	-10 (-0.72%)	1,370	1,380	1,700
Total Distribution	1,728	0.0 (0.0%)	+24 (+1.40%)	1,728	1,704	1,943
Ending Stocks	148	0.0 (0.0%)	-1 (-0.67%)	148	149	331
Extr. Rate, 999.9999	-	-	-	-	-	-

Oil, Sunflower seed. India. `000 MT

Attribute	2016/17, Aug '16	Month Change	Year Change	2016/17, Jul '16	2015/16	2014/15
Production	108	0.0 (0.0%)	+10 (+10.20%)	108	98	117
Beginning Stocks	144	0.0 (0.0%)	-105 (-42.16%)	144	249	305
Imports	1,800	0.0 (0.0%)	+250 (+16.12%)	1,800	1,550	1,531
Total Supply	2,052	0.0 (0.0%)	+155 (+8.17%)	2,052	1,897	1,953
Exports	-	-	-	-	3	4
Domestic Consumption	1,920	0.0 (0.0%)	+170 (+9.71%)	1,920	1,750	1,700
Food Use Dom. Cons.	1,920	0.0 (0.0%)	+170 (+9.71%)	1,920	1,750	1,700
Crush	300	0.0 (0.0%)	+30 (+11.11%)	300	270	323
Total Distribution	2,052	0.0 (0.0%)	+155 (+8.17%)	2,052	1,897	1,953
Ending Stocks	132	0.0 (0.0%)	-12 (-8.33%)	132	144	249
Extr. Rate, 999.9999	-	-	-	-	-	-

Health Tips

The Case for Eating Butter Just Got Stronger

It looks like butter may, in fact, be back. The creamy condiment is a “middle-of-the-road” food, nutritionally speaking—better than sugar, worse than olive oil—according to a new report, which adds to a growing body of research showing that the low-fat-diet trend was misguided. The new study analyzed nine papers that included more than 600,000 people and concluded that consuming butter is not linked to a higher risk for heart disease and might be slightly protective against type 2 diabetes. This goes against the longstanding advice to avoid butter because it contains saturated fat.

To be clear, the new study doesn’t say butter is a health food, rather that “it doesn’t seem to be hugely harmful or beneficial, ” says study author Dr. Dariush Mozaffarian, dean of the Friedman School of Nutrition Science and Policy at Tufts in Boston. This is in line with the new thinking from a growing number of nutrition scientists who say that cutting back on fat, even the saturated kind, is doing more harm than good.

“In my mind, saturated fat is kind of neutral overall,” Mozaffarian says. “ Vegetable oils and fruits and nuts are healthier than butter, but on the other hand, low-fat turkey meat or a bagel or cornflakes or soda is worse for you than butter.”

In the study, published Tuesday in the journal PLOS ONE, the researchers looked at people’s butter consumption and their risk for chronic disease and found no link to heart disease. In four of the nine studies, people who ate butter daily had a 4% lower risk of developing type 2 diabetes. More research is needed to understand why, but it may be due in part to the fact that dairy fat also contains monounsaturated fats that can improve blood sugar and insulin sensitivity.

As TIME reported in a 2014 cover story, fat had become “the most vilified nutrient in the American diet” despite the scientific evidence showing it didn't harm health or cause weight gain in moderation. “ Saturated fat was considered dietary public health enemy number one,” says Dr. David Ludwig, a professor of nutrition at Harvard School of Public Health and author of Always Hungry?. “ For the last few years there’s been research and commentary suggesting that this focus is misguided.” (Ludwig was not involved in the most recent study.)

Indeed, research is mounting that saturated fat is better for you than processed carbohydrates like sugar and white bread, which have been linked to diabetes, obesity and heart disease many times over. In April, Mozaffarian published a separate study in the journal Circulation that analyzed the blood of 3,333 adults and found that people who had higher levels of three byproducts from full-fat dairy had a 46% lower risk of getting diabetes than people with lower levels. Other studies have also shown that full-fat products like dairy can be useful in weight maintenance and other health factors.

Mozaffarian and his co-authors on the new paper hope that this research moves nutrition conversations away from the health effects of specific nutrients, instead focusing on the actual foods people eat. “ We eat cheese, we eat butter, we eat yogurt, we eat milk, and meat,” says Mozaffarian, as opposed to calcium, fat and protein. Plus, he adds, just because a pad of butter and a pastrami sandwich both contain saturated fat, it's the food that matters most. “P rocessed meats may have different effects on stroke and heart disease, not because of the saturated fat, but because of sodium and the preservatives," says Mozaffarian. "In the end, just making decisions about a food based on one thing like saturated fat is not useful.”

Getting people to follow that advice may be a challenge. A July 2014 Gallup poll found about twice as many Americans say they are actively avoiding fat compared to people avoiding carbohydrates. But a movement toward understanding the benefits or risks of foods rather than their singular nutrients may be worthwhile.

Courtesy: Time.com

Good fats can cut risk of death by 27%, study says

"This study is by far the most detailed and powerful examination of the relationship between different types of dietary fats and mortality," said Dr. Frank B. Hu, professor of nutrition and epidemiology at the Harvard T. H. Chan School of Public Health. "Our study demonstrates that not all fats are created equal, and eating healthy unsaturated fats at the expense of unhealthy saturated and trans fats is an important way to live a longer and healthier life."

Hu and his fellow researchers analyzed the eating habits of more than 126,000 men and women over a 32-year period from 1980 to 2012, checking in with each participant every two to four years about the amount and type of fat in their diets.

All of the people in the study started off with no signs of cancer, type 1 or 2 diabetes, or cardiovascular disease. In each questionnaire, participants were asked how often they consumed portions of up to 150 types of fatty foods, as well as the types of margarine, fat or oil they used to prepare dishes. The researchers then compared those results against death rates.

Hu and his colleagues found that although eating more saturated fat and trans fats was associated with an increase in mortality, eating more polyunsaturated and monounsaturated fats lowered the risk of death. In fact, the study found that if people replaced a mere 5% of their calorie intake from "bad" fats with polyunsaturated fats, they could reduce their risk of death by 27%. If those calories came from monounsaturated fats, the risk of mortality dropped by 13%.

Why weren't monounsaturated fats as protective? Perhaps the two good fats have different biological effects, Hu said. Or perhaps it's the American diet.

"A large proportion of food sources of monounsaturated fat in the typical American diet are animal-sourced, such as dairy and red meats," Hu said, pointing out that those are also major sources of saturated fats. "Therefore, current analysis may not be able to completely distinguish the benefits of monounsaturated fat from the effects of food source and saturated fats."

But the study didn't stop there. The researchers also compared fat intake to different causes of death, including cardiovascular disease, cancer, neurodegerative disease and respiratory disease. Some of their findings were "new and interesting," Hu said.

For example, people who ate more healthy fats had a lower risk of dying from neurodegenerative and respiratory disease, but both of those causes of death increased significantly with higher trans fat intake. The risk of dying from respiratory disease also increased significantly for people who ate more saturated fat.

"These results need to be studied further and replicated in other populations," Hu said. "The major takeaway is that the types of fat in our diet are more important than the total amount of fat."

However, think twice about adding carbs instead. The study also found that replacing fat calories with carbohydrates was not significantly protective against mortality.

Different roles for different fats?

Polyunsaturated fats contain essential fats your body can't produce by itself, such as omega-6 and omega-3 fatty acids. You must get these essential fats through the food you eat. Some of the best sources are nuts, seeds, fatty fish, algae and leafy greens.

One polyunsaturated fat, an omega-6 fatty acid called linoleic acid, was shown in the Harvard study to be especially protective against death by cancer and coronary artery disease, Hu said.

Prior studies showed linoleic acid to reduce total and bad cholesterol, and to be associated with better blood pressure and insulin sensitivity. Though some studies have connected too much omega-6 with inflammation in the body, others find no such link.

Linoleic acid is found in sunflower, soybean and safflower oils, as well as nuts and seeds. Walnuts, Brazil nuts and peanuts are excellent sources, as are safflower, pumpkin and squash seeds.

Another key polyunsaturated fat, the omega-3 fatty acid called alpha-linolenic, was not associated with "all-cause mortality," Hu said, but "interestingly, we found that alpha-linolenic acid was protective against death due to neurodegenerative disease."

Alpha-linolenic acid is found in vegetable oils, such as flaxseed oil, canola oil and soybean oils, and walnuts as well as green leafy vegetables.

Monounsaturated fats are typically liquid at room temperature but when chilled begin to turn solid. This healthy fat can lower bad cholesterol levels and contribute vitamin E, which many Americans are missing. The most famous example of a monounsaturated fat is olive oil, a key player in the Mediterranean diet, often touted as one of the healthiest in the world. Other good sources include avocados, peanut butter and many nuts and seeds.

What are 'bad' fats?

"Bad" fats include trans fats and saturated fats. Saturated fats are common in the American diet, in red meats and full-fat dairy. Research in this area has been mixed, with some studies finding that whole-milk dairy products could be linked to less body fat and obesity, possibly because they promote feelings of fullness and therefore less is consumed. A recent study associated dairy and butter with lower rates of diabetes, although it still found a 1% higher risk of death per tablespoon of butter.

Trans fats are the major culprit when it comes to health problems. Though they can be found naturally in small amounts in meat and dairy products, the major sources are from artificial trans fats used in processed foods.

The Food and Drug Administration banned trans fats from products in 2013, but they can still be found in many foods like crackers, cookies, doughnuts, muffins, pies and cakes, often in trace amounts that quickly add up. Research from the Harvard School of Public Health has showed that the risk of heart disease rises by 23% for every 2% of calories obtained from trans fats.

"There have been some positive trends in the U.S. diet over the past two decades," Hu said. "However, saturated fat is still over-consumed at the expenses of healthy fats. Thus, there is still a long way to go to improve the quality of fats and the overall diet quality in the U.S. population."

Courtesy: CNN

Food Fraud

The US Pharmacopeial Convention (USP) recently launched an updated version of the organization's Food Fraud Database (FFD 2.0).

Version 2.0 of the database enables users to identify historical trends and vulnerabilities using a customizable dashboard that can generate automatic alerts of new records of food fraud and automated analytics for ingredients of interest. Other available information includes incident reports, surveillance records and analytical methods gathered from scientific journals, media publications, regulatory records, judicial records and trade associations around the world in addition to thousands of ingredients and related adulterants.

Food fraud affects 10 percent of the global food supply and costs the food manufacturing industry an estimated $10 to $15 billion annually, USP reported, and the industry needs tools like FFD 2.0 to stay abreast of trends economically motivated adulteration (EMA).

"With data informed by scientists and food fraud experts from academia, industry and regulatory agencies, the new database offers even better coverage of the historical information on instances of food fraud," Jonathan W. DeVries, Ph.D., chair of USP's Expert Committee on Food Ingredients, said in a statement. USP's Expert Committees are responsible for developing and revising convention's quality standards and other tools.

The organization said the upgraded FFD 2.0 will help food manufacturers, comply with new regulatory requirements, protect their brand reputation and gain consumer trust.

"Consumers today are more educated than ever, and manufacturers risk doing irreparable damage to their brands as a result of food fraud," explained Todd Abraham, senior vice president of Global Research and Nutrition at Mondelez International and a member of USP's Board of Trustees. "The Food Fraud Database 2.0 provides food manufacturers with the ability to look at past incidents of fraud and take proactive steps to protect their supply chains — thus protecting their reputation and ensuring consumer confidence in their products."

Courtesy: Meat & Poultry

New research highlights need to abandon modern hygiene hypothesis

The July issue of Perspectives in Public Health (published by the Royal Society of Public Health) takes an objective view of ongoing research showing the hygiene hypothesis - the idea that allergies are the price we are paying for our "modern obsession with cleanliness" - is a misleading misnomer.

Not only does it undermine attitudes to hygiene at a time when antibiotic resistance threatens our ability to treat infections, it says, it also hinders the search for ways to reverse the recent dramatic rise in allergies and other chronic inflammatory diseases.

These conclusions and the underlying data are set out in this issue, in a review which summarises the consensus findings of six experts who presented at a joint conference organised by the Royal Society for Public Health and the International Scientific Forum on Home Hygiene in February 2016, together with articles from other contributors.

Whilst the primary function of our immune system is to protect us from infection, equally the system must tolerate non-harmful agents, which we also constantly encounter in our daily lives, many of which may be helpful to our health.

For the development of immune tolerance, it is believed that the immune system requires exposure to certain microbes and even intestinal worms (collectively referred to as 'Old Friends') that evolved together with humans during primate evolution in hunter gatherer times when the immune system was evolving.

Failure to develop the right 'type' of immune tolerance may lead to inappropriate responses to otherwise harmless agents such as pollen and foods, etc, causing allergic reactions; it can also attack our own body tissues causing diseases such as multiple sclerosis and type 1 diabetes.

The Old Friends mechanism was proposed by Graham Rook in 2003 as an alternative to the hygiene hypothesis, proposed in 1989 by David Strachan. Professor Rook, one of the review authors, states that "although Strachan's idea about the importance of human:microbe interactions was essentially correct, the original hygiene hypothesis that the vital exposures were infections such as colds, influenza, measles and similar childhood illnesses is unlikely. Common childhood infections are not believed to have existed in early human populations when our immune system was evolving".

Although the Old Friends are still there, our bodies are less exposed to them due to a range of changes which have occurred over the last 200 years. These include sanitation and clean water supplies (which have cut us off from Old Friends as well as harmful microbes), changes in lifestyle, rapid urbanisation, altered diet and excessive antibiotic use, all of which have had profound effects on the human microbiome (the millions of microbes which live on or in our bodies), leading to failure of immunotolerance and increased risk of allergic and other inflammatory diseases.

Review author Professor Sally Bloomfield says: "There is no good evidence that hygiene, as the public understands it, is responsible for the loss of vital microbial exposures. If our day-to-day hygiene and cleanliness habits contribute, their role is likely to be small relative to other factors.

"Modern homes, however clean they appear, are 'teeming with microbes' which come from the people and domestic animals living there, the food they eat, together with input from the local outdoor environment - and circulate constantly via hands, surfaces, etc.

"It is quite probable that the microbial (and intestinal worm) content of modern urban homes has altered, but not because of home and personal cleanliness, but because, prior to the 1800s, people lived in predominantly rural surroundings and had different diets and no antibiotics. As a result, we now interact with a very different and less diverse mix of microbes".

Courtesy: European Cleaning Journal

Tea Tree oil

Tea tree oil (TTO), or melaleuca oil, is an essential oil with a fresh camphoraceous odor and a colour that ranges from pale yellow to nearly colourless and clear. It is taken from the leaves of the Melaleuca alternifolia, which is native to Southeast Queensland and the Northeast coast of New South Wales, Australia.

Tea tree oil is toxic when taken by mouth, but is widely used in low concentrations in cosmetics and skin washes. Tea tree oil has been claimed to be useful for treating a wide variety of medical conditions. It shows some promise as an antimicrobial. Tea tree oil may be effective in a variety of dermatologic conditions, including dandruff, acne, lice, herpes, and other skin infections. However, the quality of the evidence is low, and tea tree oil is not recommended for treating fungal infections or for use on children.

History and extraction

The name tea tree is used for several plants, mostly from Australia and New Zealand, from the family Myrtaceae, related to the myrtle. The use of the name probably originated from Captain James Cook's description of one of these shrubs that he used to make an infusion, to drink in place of tea.

The commercial tea tree oil industry originated in the 1920s when Arthur Penfold, an Australian, investigated the business potential of a number of native extracted oils; he reported that tea tree oil had promise, as it exhibited powerful antiseptic properties.

Tea tree oil was first extracted from Melaleuca alternifolia in Australia, and this species remains the most important commercially. Several other species are cultivated for their extracted oil: Melaleuca armillaris and Melaleuca styphelioides in Tunisia and Egypt; Melaleuca leucadendra in Egypt, Malaysia and Vietnam; Melaleuca acuminata in Tunisia; Melaleuca ericifolia in Egypt; and Melaleuca quinquenervia in the United States. Similar oils can also be produced by water distillation from Melaleuca linariifolia and Melaleuca dissitiflora.

Composition and characteristics

Tea tree oil is defined by the International Standard ISO 4730 ("Oil of Melaleuca, Terpinen-4-ol type"), which specifies levels of 15 components needed to define an oil as "tea tree oil." The oil has been described as having a fresh, camphor-like smell.

Tea tree oils come in six different chemical combinations: a terpinen-4-ol type, a terpinolene type, and four 1,8-cineole types. These various oil types contain over 98 compounds, with terpinen-4-ol the major component responsible for antimicrobial and anti-inflammatory properties. A second component 1,8-cineole, is likely responsible for most adverse reactions to TTO products. Adverse reactions diminish with minimization of 1,8-cineole content. In commercial production, TTO is prepared as a terpinen-4-ol type.

Medical use

Tea tree oil is not recommended for the treatment of athlete's foot.

Tea tree oil is not recommended for treating nail fungus, as the evidence for its effectiveness is weak, and does not suggest it would outperform conventional treatments.

Tea tree oil is not recommended for treating head lice in children because it could cause skin irritation or allergic reactions, because of contraindications, and because of a lack of knowledge about the oil's safety and effectiveness.

Tea tree oil has been used as a traditional medicine for many years. The earliest publication in the 1920s described the use of tea tree oil as a topical germicidal product. Tea tree oil has been sold in the UK, Germany, France, Italy, Denmark, Sweden and other European countries since the early 1930's and there has been a consistent and long standing use of tea tree oil demonstrated since 1930 internationally and in the European Community.

The clinical use of tea tree oil is described in monographs published by the World Health Organisation, British Pharmacopoeia and The

Pharmaceutical Society of Great Britain (Martindale) and ESCOP (2009) (European Society for Cognitive Psychology).

In August 2007, RIRDC (Rural Industries Research and Development Corporation) and ATTIA (The eating Academy - Peter ATTIA MD) published a comprehensive dossier on the Safety and Effectiveness of Tea Tree Oil. Considerable research, much of it by the Tea Tree Oil Research Group at The University of Western Australia, has revealed tea tree oil to be effective as an antibacterial, antifungal, anti-viral and anti-inflammatory. RIRDC has funded the bulk of this research.

More recently, researchers, noting the early findings, conducted clinical trials to confirm the antibacterial activity, antifungal activity, antiviral activity and antiprotozoal activity under modern controlled clinical trial conditions. These human clinical trials have been published to show that tea tree oil is efficacious in:

- Clearance of MRSA
- Reduction of bacterial load
- Reduction of yeast and fungal infections
- Treatment of mild to moderate acne vulgaris
- Treatment of tinea pedis
- Treatment onychomycosis
- Treatment of furunculosis (boils)
- Treatment of viral infections including Herpes labialis (cold sores)
- Treatment of mild to moderate dandruff
- Prevention of head lice
- Relief of the symptoms associated with contact hypersensitivity reactions
- Relief of the symptoms of moderate to severe gingivitis
- Relief of the symptoms of fluconazole-refractory oropharyngeal candidiasis
- Relief of the symptoms of denture stomatitis
- Treatment of Ocular Demodex

More recently, a report released in July 2010 has highlighted the positive role tea tree oil (TTO) may play in the future in treating people with skin cancer.The identification of anti-cancer activity of TTO is an important step in the process to identify, test and implement effective treatments for skin cancer.

Safety

A 2006 review of the toxicity of tea tree oil concludes that it may be used externally in its diluted form by the majority of individuals without adverse effect (provided oxidization is avoided). Tea tree oil is poisonous when taken internally.

Tea tree oil is a commercially refined composition of several naturally occurring chemical compounds and is hazardous if misused. Available literature suggests that tea tree oil can be used topically in diluted form by the majority of individuals without adverse effects. Topical application of tea tree oil can cause adverse reactions at high concentration. Adverse effects including skin irritation, allergic contact dermatitis, systemic contact dermatitis, linear immunoglobulin A disease, erythema multiforme like reactions, and systemic hypersensitivity reactions.

Tea tree oil is toxic when swallowed. According to the American Cancer Society, ingesting tea tree oil has been reported to cause drowsiness, confusion, hallucinations, coma, unsteadiness, weakness, vomiting, diarrhea, stomach upset, blood cell abnormalities, and severe rashes. It should be kept away from pets and children. Tea tree oil should not be used in or around the mouth. There is at least one case of poisoning reported in medical literature.

Exposure of tea tree oil to air and light results in oxidation of some of its components. Oxidized tea tree oil should not be used. Some people experience allergic contact dermatitis as a reaction to dermal contact with tea tree oil. Allergic reactions may be due to the various oxidation products that are formed by exposure of the oil to light and/or air.

In vitro testing of tea tree oil shows that it contains chemicals which are weakly estrogenic, causing particular concern for use with children. However, in tests, the chemicals which show this effect failed to show absorption into the skin, and evidence of a hormonal effect is therefore considered implausible by an EU scientific committee.

In dogs and cats, death or transient signs of toxicity (lasting 2 to 3 days), such as depression, weakness, incoordination and muscle tremors, have been reported after external application at high doses. In rats the median lethal dose (LD50) is 1.9–2.4 ml/kg.

Undiluted tea tree oil can cause some hearing loss when used in the ears of non-human animals. However, a 2% concentration has not been shown to have any lasting effect. It is not known whether the same is true for humans.

Adverse reactions to Tea Tree Oil

Skin irritation

Undiluted tea tree oil has been reported to cause skin irritation in a small proportion of people. In one study, where 311 people were exposed to undiluted tea tree oil daily for 21 consecutive days, 5.5% experienced weak skin irritation reactions. However when exposed to a cream, ointment and gel containing concentrations of 25% or less of tea tree oil, no irritation occurred. It is likely that the irritation potential of tea tree oil may be related to the age of the oil, with aged oils (presumably containing higher levels of peroxides and degradation products such as ascaridol) displaying a greater incidence of irritation.

Skin sensitisation

There have been some reported cases of sensitisation to tea tree oil after repeated exposure. This has typically manifested as skin inflammation or rash and occurs because the immune system has reacted to the presence of the tea tree oil. Ten separate human patch test studies involving almost 9400 people have focused on the sensitisation potential of tea tree oil. Patch tests are frequently used to determine whether a person is allergic to a particular substance. They involve applying the substance to a small part of the skin and observing whether the skin 'breaks out'. In the patch test studies, an average of 1.6 per cent of people showed some allergic reaction to tea tree oil. It is known, however, that in several of the patch test studies degraded tea tree oil was used to test for sensitisation. Tea tree oil degrades when it is repeatedly exposed to air, light and high temperatures. When tea tree oil is degraded, peroxide levels increase – and degradation products can form, such as 1,2,4-trihydroxymenthane which has been shown to be a skin sensitiser. The incidence of sensitisation in the patch test studies may therefore be an overestimate due to peroxides and their degradation products in the oils tested.

Almost all adverse events to tea tree oil are minor and mostly limited to local irritation. There is some evidence that 100% tea tree oil can cause allergic reactions in some patients. The rate of allergic reactions reported in the literature in various patch testing studies ranges between 0.6% and 2.4% with a mean of 1.6%.

The incidence and strength of the reactions is generally higher with oxidised tea tree oil samples. For this reason, proper storage and handling of tea tree oil and its formulated products should be a priority to avoid the development of the by-products of oxidation as these have been demonstrated to markedly increase the risk of skin irritation and sensitisation in sensitive individuals. This is why all ATTIA members subscribe to the Code of Practice for safe, effective production and storage of tea tree oil at all times.

Clinical evidence demonstrates that tea tree oil has broad spectrum antimicrobial activity with little evidence for inducing tolerance and resistance. Products containing tea tree oil are a useful addition to the range of skin hygiene and protection products. This type of product has proven efficacy with a known safety profile with a long history of traditional use.

Research

Studies using petri dishes originally suggested that tea tree oil kills methicillin-resistant Staphylococcus aureus (MRSA) infection in nasal or extra-nasal (topical) colonization studies, but, as of 2005, there appeared to be insufficient evidence to recommend it for use. A 2008 article from the American Cancer Society says that studies have previously suggested a possible role for the topical application of tea tree oil as an antiseptic, but that, "despite years of use, available clinical evidence does not support the effectiveness of tea tree oil for treating skin problems and infections in humans."

The National Center for Complementary and Integrative Health say there is tentative evidence for the use of tea-tree oil in additional-to-standard treatments of MRSA, but notes that the evidence is from small studies, and that there is no evidence involving humans. Other uses that have been researched include applications for nail fungus, dandruff, acne, and athlete's foot, but the evidence is of poor quality. Gingivitis is mentioned as another potential use.

A 2012 review of head lice treatment recommended against the use of tea tree oil on children because it could cause skin irritation or allergic reactions, because of contraindications, and because of a lack of knowledge about the oil's safety and effectiveness.

Laugh Out Loud

- Heisenberg and Schrödinger are driving along the Autobahn when they are stopped by a police officer. The cop says to Heisenberg, who is driving, “Do you know how fast you were going?!” Heisenberg says, “No, but I knew where I was.” “OK, smart guy,” says the cop, “I’m going to search your car.” So he does, and then comes back to the window. “Did you know you have a dead cat in a box in the truck?” Schrödinger says, “No, but I do now.”

- A Chemistry professor silently forted while showing the class how to conduct chemical reactions. When students started making faces and whispering with each other, professor came to his own defense: “Class the side product of this chemical reaction is hydogen sulfide, smell awful isnt’ it”.

- A month Before Exams, we prefer Books of foreign authors.

A week before exams, we prefer Books of Local authors.

A day before exams, trying to read our own notes.

On the day of exam, we become authors

- Electron to neutron : mere pass charge hai ,spin hai, magnetic field hai, reactivity hai ... Tumhare pass kya hai

Neutron : mere pass..... MAAs hai

- Q:What do you get when you put 2 iron atoms & cobalt in mixer

CoFFee

- The greatest scientists of all times were invited to a conference ...

* Newton said he'd drop in.
* Descartes said he'd think about it.
* Ohm resisted the idea.
* Boyle said he was under too much pressure.
* Darwin said he'd wait to see what evolved.
* Pierre and Marie Curie radiated enthusiasm.
* Volta was electrified at the prospect
* Pavlov positively drooled at the thought.
* Ampere was worried he wasn't current.
* Audobon said he'd have to wing it.
* Edison thought it would be illuminating.
* Einstein said it would be relatively easy to attend.
* Archimedes was buoyant at the thought.
* Dr Jekyll declined - he said he hadn't been feeling himself lately.
* Morse said, "I'll be there on the dot. Can't stop now, must dash."
* Gauss was asked to attend because of his magnetism.
* Hertz said he planned to attend with greater frequency in the future.
* Watt thought it would be a good way to let off steam.
* Wilbur Wright accepted, provided he and Orville could get a flight.

Aryabhatta zeroed in...

- Q: What did the thermometer say to the graduated cylinder.

A: "You may have graduated but I've got many degrees"

- Q: What weapon can you make from the chemicals Potassium, Nickel and Iron?

A: KNiFe.

- Two hydrogen atoms are at a party and bump into each other. The first one says, "Hey, grab that electron, it's mine!" "How do you know?" asks the second. "'Cause I'm positive!" the first replies. –

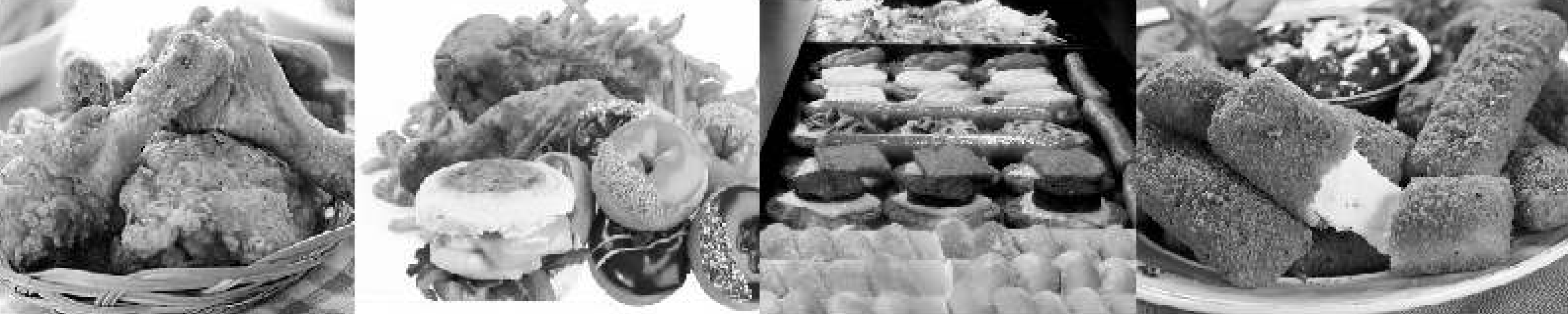
- Teacher : Pappu, tell me the chemical formula of water.

Pappu : H,I,J,K,L,M,N,O

Teacher : Nonsense! what if this?

Pappu : But Madam, you only told me that the formula of water is H to O

- 7H15 M3554G3
53RV35 70 PROV3
HOW OUR MINDS C4N
D0 4M4ZING 7H1NG5!
1MPR3551V3 7H1NG5!
1N 7H3 B3G1NN1NG
17 WA5 H2RD BU7
NOW, 0N 7H15 LIN3
YOUR M1ND 1S
R34D1NG 17
4U70M471C4LLY
W17H 0U7 3V3N
7H1NK1NG 4B0U717,
B3 PROUD! ONLY
C3R741N P30PL3 C3N
R3AD 7H15.
PL3453 FORW4RD 1F
C4NR34D 7H15



Member's PAGE

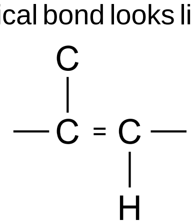
TRANS FAT – TRANS FATTY ACIDS IN FOOD PRODUCTS

Trans Fat is found in numerous food products like commercially packaged foods, Fried foods- Namkeen and Snacks, Pizzas and Burgers, Shortenings and Margarines etc. Any packaged food product which is processed in partially hydrogenated, hydrogenated oil / fat or shortening are most likely to contain Trans Faty Acids.

Trans Fatty Acids originates in our food products mainly from partial hydrogenation of vegetable oils or drying of fried products. Traces of Trans Fat are produced during process of refining or deodourisation of vegetable oils by steam distillation process of removing the volatile compounds responsible for unwanted odor and taste. Hence, small amounts may be present in vegetable oils not subjected to hydrogenation.

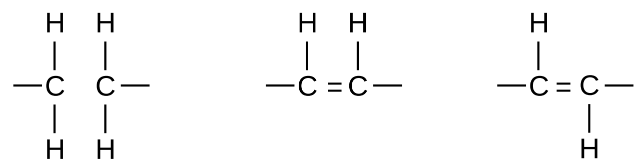
Earlier, food products were cooked and processed with palm oil, lard or butter oil which are high in saturated fat. In view of this, the use of , the healthier vegetable oils in processing of food products started. Since, vegetable oils are not stable to heat and can go rancid easily, so the process of Hydrogenation of vegetable oil started so that they can withstand better production and promote better shelf-life. As a result of hydrogenation /partial hydrogenation trans fatty acids / trans fat are produced in the cooking medium.

Trans Fat is a specific type of Fat formed when liquid vegetable oils are converted into solid Fat by the process of Hydrogenation. Trans Fat is produced ,when the hydrogen atoms at double bond are positioned on the same side of the carbon chain. However, partial hydrogenation reconfigures some double bonds and the hydrogen atoms endup on different sides of the carbon chain. This type of configuration is called Trans Fat . The structure of unsaturated chemical bond looks like :



The hydrogen atoms are at on opposite sides of the chain of carbon atoms at the carbon, carbon double bond. Basically, the vegetable oil that is partially hydrogenated

Saturated Fat	Unsaturated Fat	Trans Fat (Trans Fatty Acid)



Carbon - Carbon Single Bond	Carbon - Carbon Single Bond	Carbon - Carbon Unsaturated Double Bond Transafat

While the unsaturated fat like Monounsaturated (MUFA) and Poly unsaturated Fat (PUFA) are known to be beneficial when consumed in moderate / low quantities, saturated fat and trans fat are not recommended as these tends to raise (LDC) bad cholesterol level. It is therefore advisable to choose a food low in

both in saturated and trans fat as a part of healthy food.

In view of this FSSAI, has made Nutritional Food Labelling of Food Products Mandatory which includes in corporation of the quantity of Trans Fat . Therefore, it is essential issue that the customers using the Food Products should understand the importance of the declaration of Nutritional facts.

Satish Checker
General Manager - Tech
Shri Krishnaanalytical Services
New Delhi

FOOD PACKAGING

Ms Anshula Bhatt, Ms. Aditi Gupta
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Food packaging plays an important role in maintaining the quality of food products by providing protection from environmental, chemical, and physical challenges. Food packaging is essential because without packaging the safety and quality of food would be compromised, and pervasive because almost all food is packaged in some or the other way. Moreover, it also helps in preparing food for transport, distribution, storage, retailing, and end-use to satisfy the ultimate consumer with optimal cost.

The World Packaging Organization (WPO) estimated that more than 25% of food is wasted because of poor packaging of food products (WPO, 2009). Packaging is also referred to as the process of design, evaluation, and production of packages.

Functions of packaging :

1. **Primary Functions :**
   - Containment: depends on the product's physical form and nature
   - Protection: prevention of mechanical damage due to the hazards of distribution
   - Preservation: prevention or inhibition of chemical changes, biochemical changes and microbiological spoilage
   - Information about the product: legal requirements, product ingredients, use etc.
   - Brand communication: Use of typography, symbols, illustrations, advertising and color, thereby creating visual impact

2. **Secondary Functions:**
   - Convenience: for the pack handlers and user(s) throughout the packaging chain
   - Traceability: to improve supply management, to facilitate trace-back for food safety and quality purposes, and to differentiate and market foods with subtle or undetectable quality attributes
   - Tamper indication: special packaging features designed to reduce or eliminate the risk of tampering and adulteration

Types of Food Packaging:

(a) Active Packaging:

Packaging in which subsidiary constituents have been deliberately included in or on either the packaging material or the package headspace to enhance the performance of the package system.

Types:

— Sachets, placed in packaging
— Strips/labels, adhered at the inside of the packaging material
— Component, blended in the packaging material

Applications in food industry:

— O_2 absorbers in sachets
— Ethanol emitters/generators
— Ethylene absorbers
— Liquid absorbers
— Flavour absorbers
— CO2 emitters/absorbers
— Antimicrobial coatings

(b) Intelligent packaging:

Intelligent packaging can be defined as "packaging that contains an external or internal indicator to provide information about aspects of the history of the package and/or the quality of the food." Intelligent packaging is an extension of the communication function of traditional packaging, and communicates information to the consumer based on its ability to sense, detect, or record external or internal changes in the product's environment.

Types :

— Time-Temperature Indicators (TTI): Integrating exposure of packaged food with time and temperature. Colour changes due to mechanical, chemical, electrochemical, enzymatic or microbiological reaction.
— Quality indicators: Colour change depending on changes in quality of the food product like Flavour components, ethylene etc. and Microbiological metabolites.

(c) Aseptic packaging:

It can be defined as the filling of a commercially sterile product into a sterile container under aseptic conditions and hermetically sealing the containers so that reinfection is prevented. This results in a product, which is shelf-stable at ambient conditions. Aseptic packaging technology is fundamentally different from that of conventional food processing by canning.

Advantages:

1. Packaging materials, which are unsuitable for in-package sterilisation can be used. Therefore, light weight materials consuming less space offering convenient features and with low cost such as paper and flexible and semi-rigid plastic materials can be used gainfully.
2. Sterilisation process of high-temperature-short time (HTST) for aseptic packaging is thermally efficient and generally gives rise to products of high quality and nutritive value compared to those processed at lower temperatures for longer time.
3. Extension of shelf-life of products at normal temperatures by packing them aseptically.

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