

# What Researchers Know about Ultra-Processed Foods

*Find out more about the latest research into health outcomes associated with ultra-processed food consumption.*

AUSTIN, TEXAS, UNITED STATES, July 23, 2024 /EINPresswire.com/ -- Modern food science has brought us many benefits. Many of today's food products are available in relative abundance, packaged in ready-to-eat convenient servings, have long shelf lives that prevent spoilage, and are relatively inexpensive to produce.

Critics point to the potential drawbacks of processed foods, often dubbed "ultra-processed foods" or UPF; they maintain that ultra-processed foods are too calorically dense, containing too much fat, sugar, and salt at the expense of insufficient fiber and nutrients. They contend this combination (sometimes called HFFS, for high in fat, salt, and sugar) leads to overeating (e.g. food addiction), obesity, and other negative health outcomes.

In the following section, we'll take a look at some of the key innovations in the food laboratory, starting with fats, carbohydrates, and proteins, followed by additives, preservatives, and unwanted contaminants entering the food supply.

## A Brief History Of Fats During The Rise Of Industrial Food Production

In northern Europe, dietary fats for cooking were typically derived from the milk of domesticated animals (in the form of butter) or slaughtered animals (cows, pigs, etc.) that were rendered to



Shown above is one of five labs Formaspace manufactured for the DOD's FADL (Food Analysis & Diagnostic Laboratory), the largest of its kind in the world.

create fats (tallow), while southern Mediterranean diets relied heavily on olive oil as a primary source of dietary fat.

This changed when the French Emperor Napoleon III demanded a lower-cost beef tallow substitute to feed his troops, leading Mège-Mouriès to invent “oleomargine” in 1869 (the patents first went to Jurgens, later today’s conglomerate Unilever.)

Early margarine used beef tallow as a raw ingredient, but in 1871, American inventor Henry W. Bradley invented a new hydrogenation process to create margarine from cottonseed and other seed oils.

In 1911, researchers at Procter & Gamble introduced a “crystallized cottonseed oil.” Marketed under the brand name Crisco, this hydrogenated oil remained soft at room temperature, offering greater convenience to home cooks compared to traditional animal tallows.

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*Formaspace*

produced from soybeans or palm oil.

Today’s food scientists can create a variety of emulsified fat products that are technically fat-free (such as fat-free mayonnaise or flavored “buttery” spreads) to meet customer demand for diet ingredients.



Formaspace offers a full range of furniture options, from industrial furniture for factories to laboratory furniture for biotech research to furniture for educational, government, and military applications.

Shortages during the Depression and World War II led American margarine manufacturers to favor seed oils over beef tallow, a practice that continues to this day. German manufacturers, facing extreme shortages during World War II, developed a chemical process to create artificial fats from coal that were then turned into margarine.

The use of trans fats (partially hydrogenated oils) was phased out in the US in 2018 due to health concerns; it was largely replaced with total hydrogenated oils, often

## The Evolution Of Modern Industrial Carbohydrates

In historic European diets, bee honey, soft fruits, and certain vegetables (such as beets) were the only widely available sources of sugar sweeteners.

Sugar cane plants were first domesticated in pre-historic times in the Indonesian archipelago and later in China and then India. Muslims brought sugarcane production to the Middle East and Mediterranean regions during the first Millennium, and in 1501, Europeans began industrial-scale sugarcane production in Hispaniola.

As the price of sugar fluctuated in the post-war period, [food researchers](#) sought to develop sugar substitutes for industrial food production. The enzyme in High Fructose Corn Syrup (HFCS) was discovered in Japan in 1965 and brought to market by the Clinton Corn Processing Company in the early 1970s. Thanks to its lower cost, HFCS has replaced sugarcane in the production of many food and drink products.

The postwar period also saw increased demand for “diet” drinks and food products, leading to the widespread use of artificial sweeteners such as Saccharine (discovered in 1878), Cyclamates (discovered in 1937, withdrawn from the market in 1969 due to carcinogen risks), Aspartame (discovered in 1965), Sucralose (discovered in 1976), and Stevia (brought to market in 2008).

## Packaged Snack And Breakfast Foods

The roots of many of today’s packaged snack and breakfast foods date back to the late 19th century, when John Harvey Kellogg introduced ready-to-eat Cornflakes in 1895, followed by Charles W. Post’s Grape-Nuts in 1897. The company Post founded evolved into General Foods, whose empire by 1930 included Jell-O, Maxwell House coffee, and Birdseye frozen foods.

After World War II, producers de-emphasized the health benefits of packaged cereal products in favor of marketing so-called “pre-sweetened” breakfast cereals, such as Kellogg’s Sugar Smacks, which contained a whopping 53% sugar by weight.



Shown above is a blood lab installed at a medical device research facility outside of Boston. The seamless stainless steel workbench is fourteen feet long.

Given that most ready-to-eat cereal separates the wheat bran from the wheat germ during milling (losing nutrients in the process), the end product is often “fortified” with added vitamins or fiber, depending on the product composition.

The post-war period saw a rapid uptake in new carbohydrate-heavy convenience and snack foods, from Minute Rice (1946), “instant” mashed potatoes (1950s), Quaker Instant Oatmeal (1966), Pringles potato chips (1968), Cup a Soup instant soup (1972), and dehydrated baby food (1980s).

## Proteins In Modern Food Production

Historical European diets traditionally relied on a combination of animal meat, eggs, fish (and other seafood), nuts, and beans as primary protein sources.

Protein-rich foods can spoil easily without refrigeration, so early industrial food production focused on preservation, such as potted or canned meats, fish, seafood (such as tinned sardines), and milk, or salt and/or nitrate cured meats (hard tack, sausage, jerky, herring).

Some of the early processed protein foods were hydrolyzed vegetable protein used to make artificial meat bouillon (1831), powdered milk (introduced in the 1830s), and dehydrated powdered eggs (first appearing in the late 1890s).

These offered the convenience of a long shelf life in a pre-refrigeration world.

## The Rise Of Soybean Ingredients

Protein derived from soybeans was first used in 1936, but initially in non-food applications, including paper coatings, artificial silk fabrics, and bizarrely, as a firefighting spray foam by the US Navy in World War II. It wasn't until the postwar period that Ralston Purina introduced edible soy isolates and spun soy fiber (1960), which are commonly used today in a variety of foods, including bread, pasta, cereals, soups, cheese, and pet food.

Textured vegetable protein (TVP) was invented by Archer Daniels Midland in the 1960s. Commonly known as a low-cost “meat extender,” TVP is a defatted soy flour (often produced using a hexane-based process) that is generally made from soybean oil, although cottonseed, wheat, or oats can be used.

More recently, food producers have developed non-dairy milk alternatives derived from soy, nuts, or grains, such as soy milk, almond milk, or oat milk.

Animal feedstocks have also changed significantly since the introduction of industrial-scale agriculture and aquaculture. Whereas it was common over a hundred years ago for small-scale

farmers to feed their cattle, sheep, goats, pigs, and chickens with forage foodstuffs grown on the farm (grains, grasses, hay, corn), today's large industrial livestock and fish farms rely primarily on commercially produced animal feed, which often includes a high proportion of soybean and corn-based products.

Artificial meat products are the next frontier for protein production – either using plant-based ingredients (such as textured vegetable protein) or potentially “growing” artificial meat in the laboratory.

## Preservatives, Artificial Ingredients, And Unwanted Contaminants In Industrial Food Production

In industrial food production, preservatives are commonly added to extend shelf life, staving off the natural processes of bread going moldy, snack foods going stale too quickly, or blended (emulsified) products such as mayonnaise separating into their constituent ingredients.

Artificial additives can improve the texture or taste of food products, or they may enable lower-cost ingredients to be substituted for pricy ones without changing the palatability of the end product.

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