



THE FACTS ON FIT FRYING
Impact and Benefits for Foodservice Operators

EXECUTIVE SUMMARY



JUST THE FACTS

There's no doubt about it. Fried foods are more popular than ever.¹ In fact, the NPD Group, a New York-based research firm, reports that chicken nuggets and French fries are among the ten fastest-growing foods at restaurants – right along with entrée salads.¹ This illustrates the duality of today's consumer when it comes to food choices. They want both lighter offerings as well as fully indulgent – sometimes all in the same meal.

The Fit Frying Program was created by the experts at Frymaster, an Enodis company, specifically for operators menuing fried foods. It should also be of interest to consultants, as well as equipment dealers and specialists who serve the foodservice industry. The program seeks to provide education on the principles that ensure fried foods are prepared and served in a manner that delivers maximum taste while being as health conscious as possible. The Fit Frying Program is based on four underlying principles –

- Finding the right fryer
- Selecting the right oil
- Using best practices or “right” cooking processes
- Providing the right maintenance

THE RIGHT FRYER

The first step in the Fit Frying Program is to find the right fryer. This not only helps you produce higher quality and more healthful foods, it also extends the life of your oil. To find the perfect fryer for your operation, evaluate the nature of your business to determine which kind will best suit your needs. When it comes to being “fit,” there are essentially two types of fryers – those with sediment zones and those without.

In The Zone

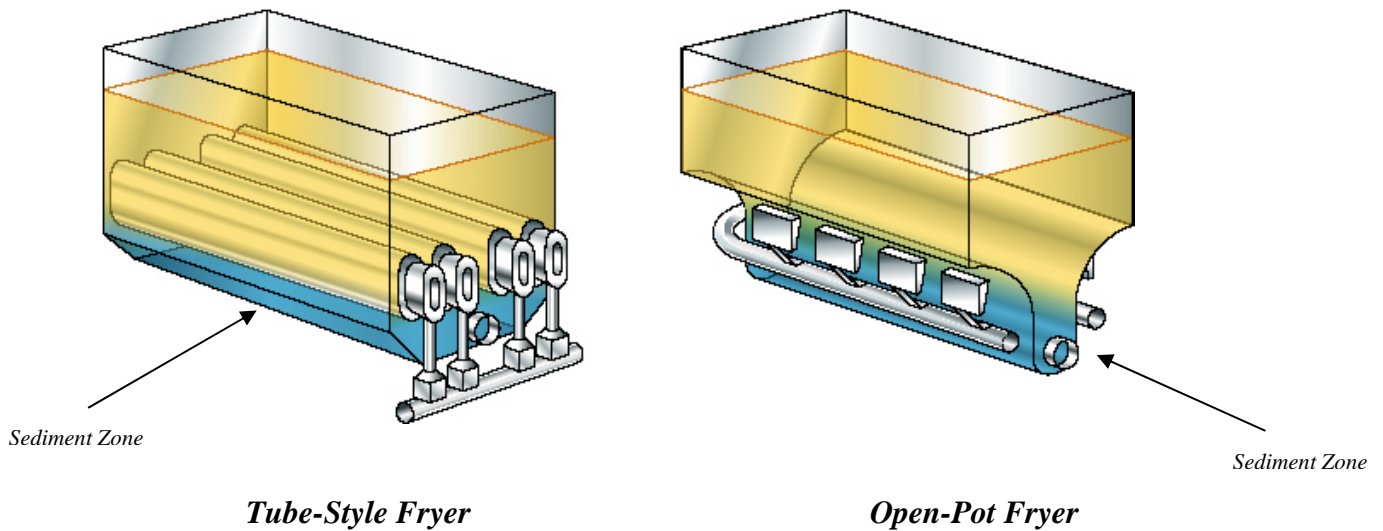
Sediment zones optimize the fry cycle by allowing carbonized contaminants from the oil to precipitate into a sediment tray, located at the bottom of the fryer. Here it is able to accumulate in the more temperate, less turbulent area of the fryer.

¹ *Supplement for the National Association of Foodservice Equipment Manufacturers Show, Restaurants & Institutions Magazine, September 2005*

Another benefit of sediment zones is oil longevity. This is because sediment falls out – or precipitates – and is captured in the sediment zone. Not only do these zones reduce carbonization and contaminants, they enhance the filtration process and extend oil life as well. Fryers that also have advanced oil temperature management systems and integrated control capabilities can further extend oil life, reduce contamination and reduce oil absorption by foods.

Some Have Zones

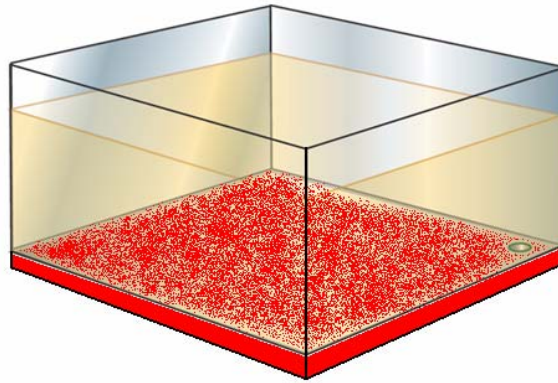
Open-pot fryers have heating surfaces outside the tank and deep sediment zones. They are considered multi-purpose units, performing well in virtually all frying applications and excelling with light to medium battered items, like French fries and pre-packaged foods. The construction of these fryers allows for the best visual monitoring of sediment status, makes them generally easier to clean, and gives them the longest oil life cycles. Across the total fryer landscape, the open-pot models generally score highly with regard to food appearance and taste, overall equipment performance, ease of maintenance and oil longevity – all factors that add up to Fit Frying.



Tube-style fryers have wider sediment zones below the burners and make a good alternative general-purpose choice. Foods that are heavily battered or breaded, like fresh fish and onion blossoms, are better suited for this type of equipment. The wide sediment areas, below the burner tubes, allow particles to settle and accumulate. However, because tubes are generally fixed in place, it can make cleaning more difficult and time consuming.

Some Do Not

Flat-bottom fryers are generally used for specialty items – usually those that float on top of the oil during the fry cycle. With a flat-bottom design, sediment and contaminants are in direct contact with the heat conducting fryer bottom, exposing these for longer periods of time to the highest temperatures in the fry pot. This can lead to more rapid oil decomposition, increased carbonization and accelerated formation of contaminant compounds in the oil.



Flat-Bottom Fryer

Because it lacks an area devoted to capturing precipitating sediment, this style of fryer allows contaminants to remain more in contact with foods prepared in them throughout the frying cycle. Patrons may complain about the appearance of “black specs” on a food’s surface or a difference in taste that can be attributed to carbonized contaminants.

Fryer Features and Benefits

Feature	Open-Pot	Tube-Style	Flat-Bottom
Sediment Zone	√	√	
General-Purpose	√	√	
Ease in Cleaning	√		
Longer Oil Life Cycle	√	√	
Wide Sediment Zone		√	
Specialty Uses			√

Source: Frymaster, LLC



More on Contaminants

Over the past couple of years, attention has been devoted to understanding the formation of acrylamides in foods and the impact these substances may have on human health. In 2002, researchers in Stockholm, Sweden reported finding acrylamide in a variety of fried and oven-baked foods. Further research, both abroad and in the United States, has shown that acrylamides are naturally occurring substances, found in a variety of foods, both cooked and uncooked. The range of foods includes coffee, cereals, potato chips, chocolate, nuts, olives and baby food.²

Preliminary research indicates that unusually high doses of acrylamides can be detrimental in lab animals. However, carcinogenicity tests performed on rodents utilized very high doses over much of the animal's lifespan. These doses may be hundreds or thousands of times greater than those to which humans are typically exposed.³ It is not known what impact, if any, there is when ingested by humans in the levels known to exist in commercial fried foods.⁴

Currently there are a number of pending recommendations on labeling items that contain acrylamide. At this time; however, no government organization or agency regulates acrylamide intake. Major governmental organizations, regulatory agencies and advisory groups have not advised consumers to alter either their food choices or food preparation methods.^{5,6} The formation mechanism for, and implications of, acrylamides in food are currently being researched and reviewed by the United States Food and Drug Administration and the World Health Organization.

THE RIGHT OIL

Once you've selected the right fryer to meet your operational needs, the next step in Frymaster's Fit Frying Program focuses on finding the right oil. Much attention and study has been given to oil in recent years – its composition, how it impacts the frying process, which types work best with certain foods, and ways to extend its life cycle.

² *Exploratory Data on Acrylamide in Food, United States Food and Drug Administration Bulletin, June 2005*

³ "Acrylamide: Is it a real threat to Public Health," position paper from the American Council on Science and Health, Joseph D. Rosen, Ph.D., Department of Food Science, Rutgers University, December 2002

⁴ *FDA Action Plan for Acrylamide in Food, United States Food and Drug Administration Bulletin, March 2004*

⁵ "Acrylamide in Foods: Frequently Asked Questions," World Health Organization, www.who.int

⁶ *FDA Action Plan for Acrylamide in Food, United States Food and Drug Administration Bulletin, March 2004*



In the past few years, there has been an increasing consumer awareness of healthier foods, even as the popularity of fried foods continued to grow. The development and refinement of oils used for cooking mirrors this trend. Research has shown that unsaturated fats (monounsaturated and polyunsaturated) are beneficial when consumed in moderation, saturated and *trans* fats are not. Therefore, it is advisable to prepare foods in oils that are low in saturated fat, *trans* fat, and cholesterol.⁷

Think of choosing oil for your fryer like buying gas for your car. The qualities of the oil most definitely impact both performance and output (food quality). Consider all oil options, features and benefits before making a decision.

Characteristics of Common Cooking Oils

Oil	Uses	Smoking Point	Flavor Characteristics	Health/Nutrition Characteristics
Canola	Deep-frying, pan-frying, sautéing, baking	High – 400F	Mild flavor	Lowest in saturated fat of all oils – helps lower cholesterol levels
Corn	Deep-frying, pan-frying	High – 450F	Light taste – can be used in place of olive oil	Believed to reduce bad cholesterol in the arteries
Grape Seed	Deep-frying, pan-frying, sautéing	High – 400F	Light taste – can be used in place of olive oil	Believed to reduce bad cholesterol in the arteries
Nextra	Deep-frying (primary), pan-frying, sautéing, grilling	High – 450F	Tallow, meaty flavor; generally a flavor enhancer	No cholesterol and no trans fat; decreases LDL
Olive	Sautéing, stir-frying	Low to Med unrefined: 320F, Extra Virgin: 406F, Virgin 420F	Bland to very strong, depending on type	A monosaturated oil – the green/golden variety has more antioxidants
Peanut (refined)	Stir-frying, deep-frying, wok cooking, sautéing, grilling	High – about 450F	Can add a rich, nutty taste, but does not absorb or transfer flavors	Contains reversatrol, which is associated with reduced cardiovascular risk and reduced cancer risk; however, it can cause allergic reactions
Safflower (refined)	Deep-frying, pan-frying, sautéing, baking	High – 450F	Bland, flavorless	High in polyunsaturated fats – helps reduce total cholesterol and LDL
Sesame (refined)	Wok cooking, dressings, flavoring	Medium – 410F	Pungent – used to flavor many Asian dishes	High in vitamin E (antioxidant), helps lower cholesterol
Sunflower (refined)	Deep-frying, pan-frying, sautéing	High – 450F	Generally bland	High in polyunsaturated fats – helps reduce total cholesterol and LDL
Vegetable (typically refined soy oil)	Deep-frying, pan-frying, sautéing, baking	High – 450F	Generally mild flavor	Soy oil is high in polyunsaturated fats – helps reduce total cholesterol and LDL; partially hydrogenated vegetable oils (PHVO) contain trans fats, which may increase risk of heart disease

Source: “Finding the Right Chemistry,” *Restaurant Startup & Growth*, June 2005

⁷ FDA Consumer Magazine, United States Food and Drug Administration, Revised May 2004



THE RIGHT PROCESS

It's not easy being oil. During use, its composition changes as it interacts physically and chemically with food, oxygen and heat. Byproducts are created as a result of this process, some of which evaporate, and some of which stick around – changing the oil's nature. Contaminants, including food particles, and water and starches migrating from food during cooking, can get into the oil before, during and after normal cooking.

There are several ways operators can minimize potential oil contamination and slow changes in composition –

- Load, then shake fry baskets away from the fry pot area, allowing food particles and other contaminants to fall safely away from the oil.
- Remember CWASH: avoid unnecessary exposure to crumbs, water, air, salt and heat.
- For normal contaminants entering the oil during cooking, careful and frequent filtering coupled with good fry station management will remove solid contaminants including food particles and non-dissolved salts.
- If oil is contaminated by any unexpected substance or object it should be disposed of immediately in accordance with safe handling guidelines. The fryer should also be carefully cleaned and sanitized before being used again.
- Follow the manufacturer's recommendations and instructions for fry pot cleaning and replace oil promptly when needed.
- Maintain optimal oil temperature in the cooking zone. It extends oil life and avoids situations in which foods are cooked too quickly or at a temperature that's too high.
- The duration for which food is held at a specific temperature is referred to as the "cooking curve." This can vary based on the type of food involved, operator preference and desired outcome – including oil absorption.
 - For best results, oil temperatures should be maintained at 330°F–350°F at the beginning of the fry cycle – then reduced to near 330° F for a short period, then elevated again to 330°F-350°F.

NOTE: In Europe, some EU countries have adopted standards for measuring oil properties and requiring oil change and management based on those measurements.



THE RIGHT MAINTENANCE

Following Frymaster's guidelines for fry station management, oil filtering and temperature management can extend oil longevity in an open pot fryer. Frequent oil filtering removes sediment and contaminants from food, slows the creation of compounds that affect oil quality, and significantly extends oil life. Frymaster recommends that most operators filter oil at least once daily. In high volume operations and when frying heavily battered items, you should filter periodically throughout the day. Frymaster recommends fine particle filtration at the 5 micron level, which greatly extends oil life by removing a wide variety of contaminants. It also prevents visible carbonized particles from being deposited on food.

Oil polishing is a process by which filtering takes place for an extended period of time to maximize clarity and oil life cycle. With integrated filters, oil polishing can be conducted at start-up and at various times during the day when patron traffic is slower. Integrated filters make the process easier and more convenient for employees, increasing the likelihood that it actually happens.

CONCLUSION

As an industry leader, Frymaster is taking proactive steps to educate foodservice operators in all sectors on the benefits of proper frying technique. Knowing how to properly operate and maintain a fryer can help ensure your foods are health conscious and consistently delicious. It also helps minimize costs by extending the life of your oil and machinery. The Frymaster Fit Frying Program is based on a simple 4-step process –

- Finding the right fryer
- Selecting the right oil
- Using best practices or “right” cooking processes
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To learn more about Fit Frying visit www.frymaster.com.



FRYMASTER - THE RIGHT RESOURCE FOR YOUR OPERATION

Frymaster is a market leader in commercial foodservice equipment – the choice of many of the world’s largest foodservice chains. It is the leading fryer brand in terms of market share – with more fryers in use throughout the world today than any major brand. A pioneer in frying technology, Frymaster owns more than 84 patents. Among the company’s areas of focus are combustion technology, electrical heat generation and management, advanced materials applications, control systems, micron level particle filtration, oil use and management, and ergonomics. Frymaster markets two brands, Frymaster and Dean, offering open vat, tube-style, cold zone and flat bottomed fryers. Frymaster also offers integration of different types of fryers and filtration systems into one bank, providing the flexibility to best fit the operators menu and volume.

Frymaster partners with prominent research labs and experts to further the science of frying and expands this learning through one-on-one work with key customers, participation in industry and scientific groups, and through industry-leading Frying Masters training programs. Over the past 70 years, Frymaster has commissioned and participated in a variety of independent tests conducted by third party labs on oil contaminant analysis and prevention, oil characteristics, oil management and performance. These studies include –

- Libra Labs Analysis June 2005
- MG Edible Oils Particle Size Study September 2000
- PG&E “Frying Medium Quality Life Determination” January 1992
- ADL Shortening Saver Fryer Study September 1988

Frymaster has a long history of participation, contribution and leadership in local, regional, national and international groups focusing on technology, equipment, food, nutrition and health. The company monitors, participates in, and provides both scientific and practical input to a wide range of initiatives related to consumer health, nutrition, industry regulation, operational safety, and improved business results. Frymaster is committed to continuing its leadership and participation in these areas to help operators deliver the best results with fried foods.

For more information visit www.frymaster.com.