

Out of the Frying Pan and Into the **Grease Fire:** A Case Study in Food Science

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Joe, the restaurant manager, shook his head, but Fire Chief Tipton was not about to give up. "Something's not right here," he exclaimed. "Grease fires in fast food restaurants are *not* the norm—in fact, they're so uncommon that they make the bloody news."

Fast Food Fire at "Famously Frenchy Fried"

Sunday, December 15, 2002
News Report: *Springfield Gazette*
ANTON KAZINSKI—Roaming Reporter

Last night at 10:15 pm EST, a fire at the newly opened "Famously Frenchy Fried" restaurant on Market Street caused close to \$500,000 in damages. Although the sprinkler system contained the fire long enough for the fire department to arrive in time to save the main dining area of the restaurant, major damages were sustained to the kitchen area of this popular hangout. An eyewitness report stated that employees and customers alike were screaming and stampeding out of the doors while a roaring fire was blazing out of the deep fryers in the kitchen. Smoke filled the air. While nobody was seriously injured, a few patrons and employees were treated for minor smoke inhalation at Memorial Hospital and released that evening. Fire department officials speculated a grease fire as the most likely cause of the blaze, but the investigation was still ongoing.

Tipton slammed the newspaper on the desk and asked Joe to go carefully over the events of that night one more time.

"I was in my office working on last month's report," Joe said, in a quiet voice, "when I heard the fire alarm go off. I ran into the kitchen area and saw the fire in the deep fryers. The sprinkler system had engaged already and really made a mess of things. Oil had splashed out of the fryers onto the floor, making the floor slippery and dangerous to walk on, and the smoke and steam made it hard to breathe."

"It saved you, that's what it did," Tipton commented.

Tipton quickly reviewed the report of the investigation. "OK, Joe, here is what we have. The fryers were set at 385° Celsius. Isn't that a little high?"

Joe's head jerked up. "Oh my God! Did you say 385° Celsius? Our frying temperatures are around 385° Fahrenheit, not 385° Celsius. What would 385° Celsius be in Fahrenheit? A heck of a lot higher." Joe brushed his hand over his head. His knees were shaking violently.

Tipton prodded further. "How often do you change your frying oil?" he asked.

"Why?" Joe asked. He was confused. He had recently been promoted to manager of the new restaurant after having worked first as cashier for three months and then in the kitchen for six months at a "Famously Frenchy Fried" restaurant across town. He knew that the regs were clear on this issue. Frying oils needed to be freshened daily because some oil was always absorbed into the food and the level of free fatty acids had to stay below 1%—"whatever that meant," Joe thought. He also knew that the oil was supposed to be changed when oil degradation products such as polymers were building up. Joe was a history major in college and was a little sketchy on this issue of fatty acids and polymers. However, he wanted his new restaurant to do well, so he had pushed it occasionally to several weeks before changing the oils. The customers didn't seem to mind. In fact, he couldn't remember when the oils were changed last and his books wouldn't help him.

Tipton kept on hammering away with more questions: "What type of oil do you use? Who is your supplier? Do you keep records of the lot numbers? We need to trace the oils back to see if there was anything unusual about them."

Joe had a feeling of impending doom—that nauseating feeling you get in the pit of your stomach when you know your world is about to come crashing down around you. He recently had switched to a cheaper oil; the sales guy had been really convincing and had assured him that the oil would perform just as well as the high quality branded oil they had been using in the past. Joe tried to recall what oil the sales guy said it was. He remembered that the restaurant chain owner, an old fellow who talked about "the old school" and the "good old days," kept telling his managers about his secret blend of peanut oil, corn oil, and avocado oil, which allowed him to use a slightly higher frying temperature that "locked in the good flavor." Avocado oil—what the heck is an avocado anyway. That avocado oil was outrageously expensive. By switching to the cheaper oil—he remembered now, it was a "semi-refined soy oil"—he could save a bundle and make that old man rich. Well, maybe after that half a million dollars in damages were paid off first....

Your Assignment

You are the Fire Chief Tipton. You were able to get Joe to tell you everything that he was just thinking about. Now you have to prepare the report for the insurance company about the cause of the fire. Do not be judgmental or assign blame in the report, but simply state the facts and the various causes and their effects for what was observed and reported—this is supposed to be a dull, but chock-full of facts, insurance report.

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