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Fried By a Fryer

I've decide on addressing a piece of equipment I've always felt gave me the hardest time throughout my carrier in a kitchen. Deep frying food was said to come around in the 5th millennium BC by the Egyptians. Egyptians had a fondness for a treat of fried cake or dough. Though this technique was developed around this time it wasn't very practical as oil was a scarce commodity and usual only reserved for the wealth or royalty. Over the years and with the different processes for making oil and the different types of oils that came available frying became more popular and more readily available to all. Moving into the 19th century deep frying some foods, like French fries, became a staple in all restaurants in the United States (besides those goofy places with full raw food menus). Fast food joints cornerstone the fryer right from the get-go, but they limited the use to basic uses, chicken nuggets, breaded chicken patties, some deserts, and french-fries. In my carrier as a chef, I've fried almost everything from apples to quinoa and even water (yes, I know that's weird I just wanted to see if I could do it). Though the fryer has come along ways from its start in a pot over coals its design has been straight forward. With no real displays in its design apart from standing over it and looking into the fryer if possible. A deep tub in which the oil goes, anywhere from 1 to 4 baskets for dropping food into, internal temperature controls, vent coming from the back, and heating coils in the bottom of the tub (figure 1).

(1)   

A lot of the fryers though very simply designed do have the ability to get addons such as timers and displays, but they usually cost more than the fryer itself and require a specialist to install. Even then they are very simple in design and usually placed in inconvenient locations like above the fry attached to the hood system. Many other problems arise such as the addons getting too hot to use, shorting them out, and adding extra weight and strain to the hood system. I feel that this device could be greatly improved not only in its design but also how its laid out in kitchens for user ease and work efficiency. We can learn a lot from fast food joints as they design their spaces for quick efficiency while other restaurants leave the layout of the kitchen as an afterthought and then fill the space where they can with the equipment they need (Figure 2).

(2)  

The Why

In 15 years, I've walked into and opened countless restaurants and had to work in some of the worst and best conditions in the industry, but one thing was a constant. When ever something needed to be fried it was inconvenient on so many levels weather it be the time, placement of the fryer, other people who need to use it, or even the space to work around with it. Some places would use a small tabletop fryer for quick fry, but it has a hard time maintaining its temperature in a high-volume restaurant it also tends to take up a lot of workspaces that could be put to better use. Many restaurants only have a large standing fryer which must be placed in awkward locations in the kitchen where there's nowhere to place the things you need unless you make shit the space. I think with a few small adjustments and modifications we can begin to ease the stress of using the fryer while increasing output and precision.

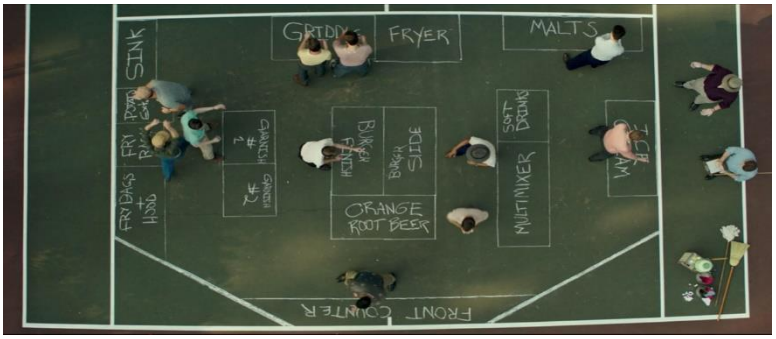
The Data

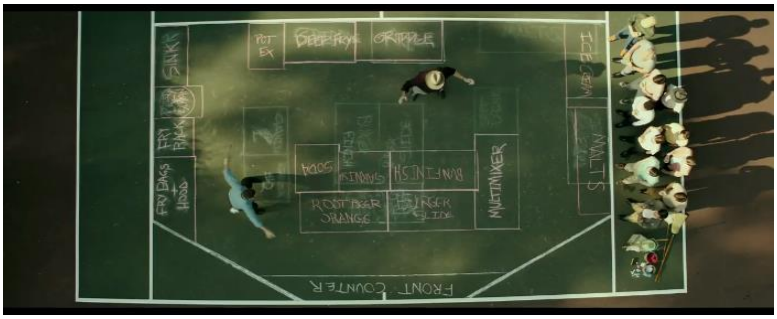
One of the most popular products cooked in a fryer is fried chicken. Though there are many other food items we could talk about such as French fries or mozzarella sticks im using fried chicken as the base line for my research due to its popularity and its complexity to cook as well as its many ways that it can cause food born illnesses. On average the people of the US consume 8 billion chickens every year of the 8 billion 57% is fried. On average it takes 12 to 15 minutes in the fryer to cook a thigh or breast in a fryer (to get to an internal temperature of 165 which is the FDA required temp for safe cooking) while only 8 to 10 min to cook a leg or wing. From a local restaurant I was helping with in Spokane over 4 weeks I was able to calculate that on average they sold around 22.5 lbs. of fried chicken every weekday and on Friday to Sunday they sold over 47 lbs. of chicken per day. With that many chickens being sold we ran into problems with the fryer holding temperature and someone having to constantly check on the product in the fryer and queuing up other orders that needed to get fried. Which caused long

ticket times and a waste of one employee's time that could have been better spent doing other tasks. If we consider the average pay of a cook in WA at $15/hr and having to check on the chicken every 6 minutes during a shift that runs 8/hrs long that works out to 80 mins wasted on checking chicken costing a little over $15 per day to watch chicken $105 a week, $420 a month, and over $5,040 a year wasted on 1 person watching chicken. Which doesn't include wasting time running from the cooler or prep station to grab the product to fry since most kitchens don't have space near a fryer to keep said product. We also need to take into account the repetitive motion of either bending over or crouching since the lack of space in a kitchen requires you to put storage where you can which is usually in lowboy coolers (figure 3) or in standing coolers in different locations. The repetitive bending over can lead to serious back complications not including the high stress of a job in a kitchen. We also start to run into the problem of cross contamination where the employee may touch other things or mishandle the product against FDA food service regulations.

(3)

Such problems can lead to lifelong mobility issues, dissatisfied clients / failing restaurant, health violations so severe that shutting down a restaurant is the nicest of fines you can get from the health board, and even possibly killing someone with salmonella or streptococci. What we can learn from companies such as McDonalds, Burger King, Wendy's, and others is that by optimizing the space and making things more ergonomic production can increase by upwards of 25%. In an article released by the Foodservice Equipment Journal in 2016 they talk about how the efficiency design of the modern-day McDonalds kitchens could be incorporated into other industries and have the same production increase. McDonalds decided to test the theory through a Taiwanese shipping company that was struggling to keep up with the shipping demands in their country. The company did not hire anymore employees but instead moved their truck loading and unloading to opposite ends and introduced a more efficient processing line. They were shocked to find that their ability to handle the same volume as they had previously was no longer a problem to process. There began to be more business as they were finding that they have more time for taking in more business. (McDonalds original efficiency test)





The Plan

For the overhaul of the fryer, I want to address these problems while keeping in mind the cost of the product to the consumer. Let's begin by tackling one problem at a time. I would like to address the watching of the food in the fryer to make sure there are no more need for someone to stand over the fryer by introducing a very simple fix to it. A display introduced to the fryer which would be standard design and not an addon. The display would have temperature reading to easily gauge if the fryer is able to keep its temp or is struggling during rushes. If the temperature fell about 20 degrees, then a small beep would sound letting you know of the drop in temperature. The display would also include a quick timer function that you could simply press, and the timer would start after you set the preset times and items for each button. On the side of the display will be a place that holds a temperature probe that you can quickly stick into the product to make sure it cooked all the way through. Such simple changes would go a long way to eliminating the guess work of cooking times and temperatures as well as the finishing of food products with minimal training, struggle, and guess work. As for the workspace for products it would not so much need to be a permanent design to the fryer but a cheaper and more effective addon with a low price and no special installation needed. By creating a stainless-steel plate that can slip over the edge of the fryer and protrude slightly off to either the right or left of the fryer you now have a workstation you can rest things on without having to run around the kitchen back and forth to work (figure 4).

(4) 

By design this is a very simple fix and something that has very little cost and easy to clean at the end of the day. The simplicity of this design would also allow for multiple trays to be place on a fryer if needed. For example, in one restaurant I would fry a couple of our garnishes like crispy quinoa, sweet potato strips, and chicharrons. My life would have been so much simpler if I could have had the raw product on one side then when it was done just transfer it to the container on the other side and do all 3 garnishes in a row quickly and efficiently. Instead, the amount of space I had to put things was limited to one at a time and even stacking pans on top of each other which would require me to be careful as to not break or crush the garnishes as I finished with them. I could even lay paper towels down on one of the trays and use it as a resting rack to make sure all the oil drains off the food.