(Approx. 1583 words)

Tech Up In Smoke

President's Corner

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Cooking has been an important element on humanity's path to civilization. In addition to warmth and light, the mastery of fire brought the ability to heat food and drink. Cooking food to a sufficient temperature to kill pathogens helps prevent food-borne illnesses. The ability to boil water and cook food is essential to human health and played a big part in helping to build today's advanced society.

Technology has played a significant role in food preparation and cooking. Over the thousands of years of human history, we have developed many ways to cook safe, nutritious, and appetizing food. Like in many other fields, we have recently made tremendous advancements in cooking tech. My grandmother, who had a reputation as a good cook, started out using a wood-fired stove when she was a young wife on a farm in rural Nebraska in the 1920s. When electricity came to the farm in the 1950s, she used an electric stove and oven, and in the 1980s, 's added a microwave oven. It always seemed interesting to me that she saw and embraced such changes in cooking technology over her lifetime. Still, like many of our tech, the rate of progress and advancement has slowed since microwaves. There is better control and more sophisticated programming of our cooking, but no one seems to be cooking with lasers or particle accelerators yet.

When I was growing up, the future of food seemed to be going in a modernistic direction. Microwave ovens enabled quick meals and snacks from prepackaged sources. Microwaveable dinners and microwave popcorn made food prep easy and fast. Space food sticks, instant breakfast (powdered drink mixes), and Tang came from our space race days and seemed to point to a future of convenience from processed foods. In recent years we seem to be going in the opposite direction; however, today, there is a greater emphasis on healthy, whole, less pre-processed, fresher, and a return to more traditional food preparation and cooking methods.

One traditional food preparation method I enjoy is smoking. The most common smoked meat products are bacon, ham, and sausage, but almost any meat can get enhanced flavor from smoking. Cheese can be smoked, and even vegetables gain flavor from the process. We have a long smoking tradition in my family. My grandfather used a smokehouse on the farm to prepare hams, bacon, and other meats. My father owned a home smoker, and our family Christmas dinner almost always had smoked prime rib of beef at its core. I got a smoker soon after I moved out and have now taken over that part of the family holiday cooking duties. My son has had several smokers and cooks with them much more often than any other family member.

Smoking is one of the oldest forms of food preparation, imparting flavor and providing some preservation. There are two types of smoking; the food is subjected to wood smoke in an enclosed container. In cold smoking, the food is exposed to low-temperature smoke (60 to 120 °F); the smoking process does not cook it (cheese is smoked this way). Hot smoking uses smoke that is hot enough (200 to 300 °F)

to slowly cook the meat (as in BBQ).

The basics of smoking are still the same, but the technology has changed over the years. My grandfather's smokehouse was just a small wood structure in which meats were hung and a smoldering fire burned for days or weeks. My cylindrical steel smoker burns charcoal in the bottom pan for heat. Wood chips or chunks are placed on the coals to generate the smoke. A water pan above the coals buffers the heat and provides moisture and a bit of steam. The food is placed on steel racks above the water pan. This type of smoker could also use an electric heating element or a wood fire as its heat source.

My son once had a Traeger smoker, which burned pre-made wood pellets. The pellets are dispensed in a controlled way into the fire under the meat to regulate the fire temperature. A pan of water can be placed on the grill with the meat to add moisture. These pellet grills and smokers can be very sophisticated, with Wi-Fi connections allowing remote control and monitoring through a smartphone app. One downside to them is that you must buy their wood pellets. My son now has a more traditional "stick" smoker with a cooking chamber and a separate firebox. Wood is burned in the firebox, which is connected to the grilling chamber to provide heat and smoke to the food indirectly.

 I like my steel cylindrical smoker, but determining when the meat is
 done is often difficult. While it is said that you really can't overcook
 in a smoker, getting the desired level of doneness can be challenging. It does not help that I often only use the smoker a few times a year, typically for a holiday or party where my smoking is center stage. In the early years, I cooked by time alone, with reasonable results, though I usually suffered through a lot of stress, wondering when to take the meat off. Unfortunately, removing the cover to examine the meat or measure its internal temperature released heat that had to build back up, slowing the cooking. All I had to go by was experience and a small, questionable relative temperature indicator built into the smoker top cover. Many variables come into play when you have a target time to eat and then have to work backwards through when to take the meat off, when to put it on, and when to start the coals. I've had to try to compensate for cold, rain, and warm days in my process over the years to produce the results that have come to be expected.

When low-cost electronic cooking thermometers became available, they seemed to improve my results' repeatability. I could now continuously monitor the meat's internal temperature and, thus, doneness. This was a big help, but issues remained. We almost always smoke two pieces of meat for our large holiday gatherings, one on the smoker's top grate and one on the bottom. I wound up with two different digital BBQ meat thermometers and used one for each piece of meat. Unfortunately, the two thermometers did not read the same; one read about five degrees higher than the other. This reminds me of the saying," The person with one clock always knows what time it is, while the person with two is never sure." I also found knowing the smoker's internal air temperature and the water bowl temperature would be very helpful, but that meant buying even more electronic thermometers.

For Father's Day last year, I received the gift that changed my outlook o n smoking: an Easy BBQ 6-probe digital electronic meat thermometer with Bluetooth capability. This combined the capabilities of six separate thermometers in one device and allowed it to be controlled and read through a smartphone app. This would allow me to gather much more data on smoking and better predict the doneness of the meat and the time required to achieve it.

With six temperature probes, I could simultaneously monitor the temperatures of the bottom meat, top meat, bottom grill air, top grill air, water pan, and outside ambient air.

When I had it all instrumented up, all the wires coming out of the smoker reminded me of photos of the "Gadget" device that exploded in the first atomic bomb test at the Trinity test site in New Mexico in 1945.

One problem I have not found a way to work around is that the app won't connect to the thermometer device through Bluetooth when running on my new Samsung Galaxy S22 phone. It will work when running on my old Samsung Galaxy J3 phone (which I kept), so it may be an app compatibility issue with the new Android version. While annoying, it is not that objectionable as long as I can continue to keep my old phone working. I also found that this product that my wife purchased for me from Amazon ($45.99 at the time) is no longer available, so I hope it lasts. Some reviews on Amazon reported that the probes could fail, so I'm considering buying some of the replacement probes that are still available.

The app can show the temperatures of all the monitored points as the smoking goes on, but the only way I have found to record the data (other than writing it down) is to take screenshots from the app on the phone. The best thing about the app is that it can show graphs of each temp probe over the cooking time, which can be very useful for determining how these monitored points relate to each other over time. I capture these graphs with a screenshot as well.

With all the data collected from the 6-input thermometer, I can feel more confident in predicting when cooking is done to the desired level and how making changes will affect the cooking time. For example, now I'll know better when I need to stir the coals to turn up the heat or leave them undisturbed to reduce the heat so that the meat can come out of the smoker at the desired time with the desired doneness. So here's to cooking the traditional way with a high-tech assist!