

MOCREO[®]

A chef in a black uniform is focused on plating a dish. He is using a spoon to drizzle a sauce over a piece of fish on a white plate. The kitchen background is slightly blurred, showing various kitchen equipment and a menu board on the wall. The lighting is warm and focused on the chef's work.

**Real-time Temperature & Humidity
Monitoring System
For Your Restaurant**

Foodborne illness

In January 2011, The research from CDC has reported that each year 31 major pathogens acquired in the United States caused 9.4 million episodes of foodborne illness (5.5 million (59%) were caused by viruses, 3.6 million (39%) by bacteria and 0.2 million (2%) by parasites, 55,961 hospitalizations (64% were caused by bacteria, 27% by viruses, and 9% by parasites), and 1,351 deaths (64% were caused by bacteria, 25% by parasites, and 12% by viruses)

Text Source: https://wwwnc.cdc.gov/eid/article/17/1/p1-1101_article

Data Source: <https://wwwnc.cdc.gov/eid/article/17/1/p1-1101-t2>

<https://wwwnc.cdc.gov/eid/article/17/1/p1-1101-t3>

As we can see, food safety is the serious issue that we must focus on, especially for restaurant industry. The quality of foods is crucial for every restaurant otherwise a meal with spoiled food is eaten by customer, which would threaten the public health.



How to prevent foods from being contaminated? The core lies in the food storage temperature.

Without proper protection, bacteria and fungi rapidly colonize, increase in population and produce toxic and distasteful chemicals (Janzen 1977, Blackburn 2006, Pitt and Hocking 2009)

You can see the following graph (in the article from BioScience ,July 2015), which has pointed that the higher temperature is, the more bacteria multiples. Most spoilage of food meant for human consumption is caused by microorganisms, which would lead to another serious issue: food waste.

https://www.researchgate.net/publication/279939239_Food_Spoilage_Storage_and_Transport_Implications_for_a_Sustainable_Future

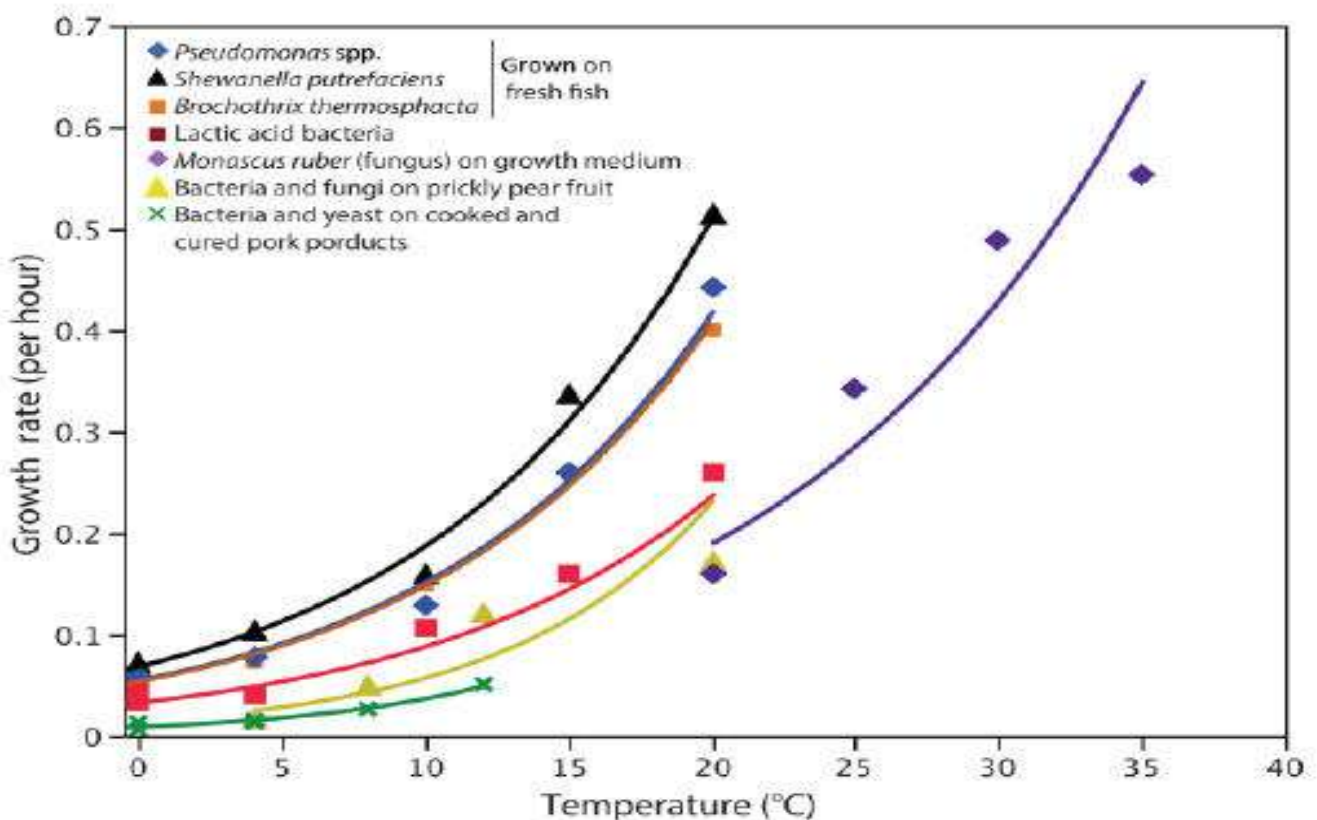
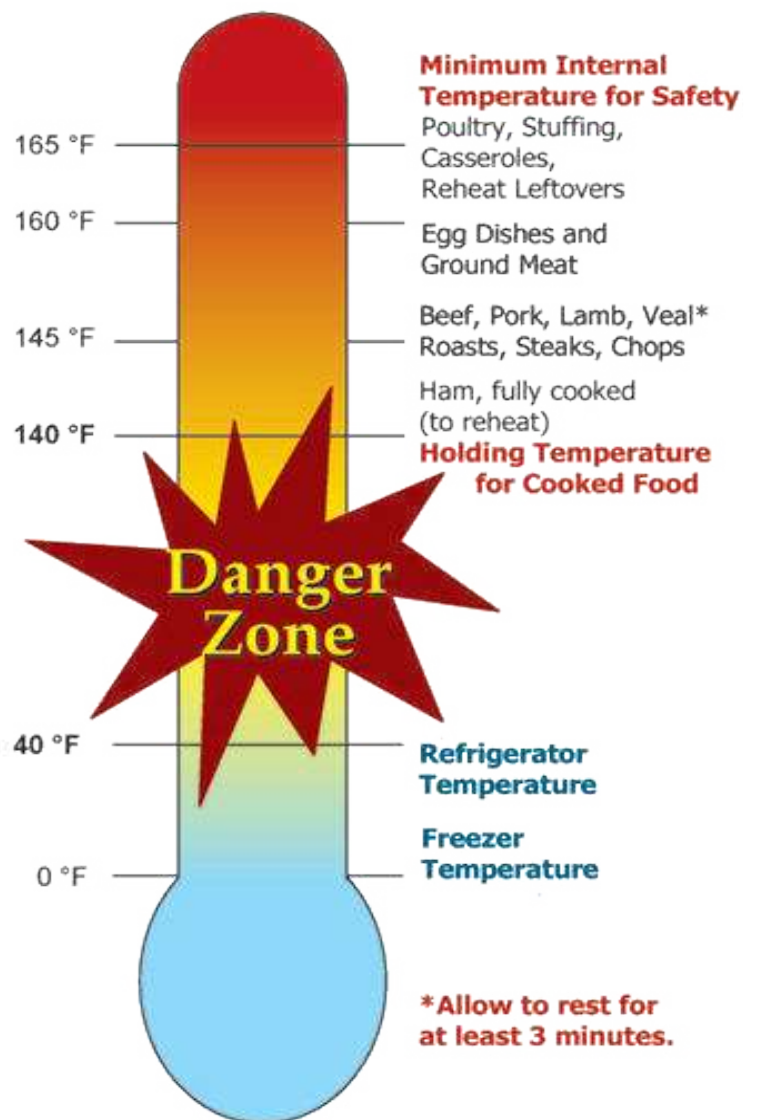


Figure 1. The temperature-dependent growth rates of various microbes involved in food spoilage. An exponential curve has been fitted to the data points for each culture using ordinary least squares. See supplemental table S1 for the data sources and statistical methods. Abbreviation: °C, degrees Celsius.

Food waste

Researchers observed that 4% to 10% of food purchased by restaurant leaders never gets to the customer totaling approximately \$1000 of the company's revenue per 3.3 lb of food waste (Christ & Burritt, 2017; Massow & McAdams, 2015; Miroso et al., 2016). Approximately 31% to 40% of the food served to customers never gets consumed (Vogliano & Brown, 2016).



Dara Source: <https://scholarworks.waldenu.edu/cgi/viewcontent.cgi?article=1371&context=ijamt>

MOCREO[®]



Improper storage is one of reasons of food waste in restaurant industry. The refrigerator should be at 40 ° F or below and the freezer at 0 ° F or below, which helps prevent growth of the harmful microbes. When the storage temperature rises up to “danger zone” and keeps for a long time, the foodstuffs are tend to be contaminated and don’t adhere to the food safety requirements. Hence, the restaurant leader has no choice but to throw out the spoiled foodstuffs, thereby causing the food waste.

Meanwhile, if foodstuffs are stored beyond the appropriate storage time, they would reproduce the bacteria as well. And you can see the following chart which shows the FDA’s recommended storage time to keep foodstuffs from spoiling or becoming dangerous.

<https://www.fda.gov/media/74435/download>

REFRIGERATOR & FREEZER STORAGE CHART

These short but safe time limits will help keep refrigerated food 40° F (4° C) from spoiling or becoming dangerous. Since product dates aren't a guide for safe use of a product, consult this chart and follow these tips:

- Purchase the product before "sell-by" or expiration dates.
- Follow handling recommendations on product.
- Keep meat and poultry in its package until just before using.
- If freezing meat and poultry in its original package longer than 2 months, overwrap these packages with airtight heavy-duty foil, plastic wrap, or freezer paper, or place the package inside a plastic bag.

Because freezing 0° F (-18° C) keeps food safe indefinitely, the following recommended storage times are for quality only.

Product	Refrigerator	Freezer
Eggs		
Fresh, in shell	3 - 5 weeks	Don't freeze
Raw yolk, whites	2 - 4 days	1 year
Hard cooked	1 week	Don't freeze
Liquid pasteurized eggs or egg substitutes, opened	3 days	Don't freeze
unopened	10 days	1 year
TV Dinners, Frozen Casseroles		
Keep frozen until ready to heat		3 - 4 months
Deli & Vacuum-Packed Products		
Store-prepared (or homemade): egg, chicken, tuna, ham, macaroni salads		
	3 - 5 days	Don't freeze
Pre-stuffed pork & lamb chops, chicken breasts stuffed w/dressing		
	1 day	Don't freeze
Store-cooked convenience meals		
	3 - 4 days	Don't freeze
Commercial brand vacuum-packed dinners with USDA seal, unopened		
	2 weeks	Don't freeze
Raw Hamburger, Ground & Stew Meat		
Hamburger & stew meats	1 - 2 days	3 - 4 months
Ground turkey, veal, pork, lamb	1 - 2 days	3 - 4 months
Ham, Corned Beef		
Corned beef in pouch with pickling juices		
	5 - 7 days	Drained, 1 month
Ham, canned, labeled "Keep Refrigerated," unopened		
	6 - 9 months	Don't freeze
opened	3 - 5 days	1 - 2 months
Ham, fully cooked, whole	7 days	1 - 2 months
Ham, fully cooked, half	3 - 5 days	1 - 2 months
Ham, fully cooked, slices	3 - 4 days	1 - 2 months
Hot Dogs & Lunch Meats (in freezer wrap)		
Hot dogs, opened package		
	1 week	1 - 2 months
unopened package	2 weeks	1 - 2 months
Lunch meats, opened package		
	3 - 5 days	1 - 2 months
unopened package	2 weeks	1 - 2 months

Product	Refrigerator	Freezer
Soups & Stews		
Vegetable or meat-added & mixtures of them	3 - 4 days	2 - 3 months
Bacon & Sausage		
Bacon		
Sausage, raw from pork, beef, chicken or turkey	7 days	1 month
Smoked breakfast links, patties	1 - 2 days	1 - 2 months
	7 days	1 - 2 months
Fresh Meat (Beef, Veal, Lamb, & Pork)		
Steaks	3 - 5 days	6 - 12 months
Chops	3 - 5 days	4 - 6 months
Roasts	3 - 5 days	4 - 12 months
Variety meats (tongue, lardons, liver, heart, chitterlings)	1 - 2 days	3 - 4 months
Meat Leftovers		
Cooked meat & meat dishes	3 - 4 days	2 - 3 months
Gravy & meat broth	1 - 2 days	2 - 3 months
Fresh Poultry		
Chicken or turkey, whole	1 - 2 days	1 year
Chicken or turkey, parts	1 - 2 days	9 months
Giblets	1 - 2 days	3 - 4 months
Cooked Poultry, Leftover		
Fried chicken	3 - 4 days	4 months
Cooked poultry dishes	3 - 4 days	4 - 6 months
Pieces, plain	3 - 4 days	4 months
Pieces covered with broth, gravy	3 - 4 days	6 months
Chicken nuggets, patties	3 - 4 days	1 - 3 months
Fish & Shellfish		
Lean fish	1 - 2 days	6 - 8 months
Fatty fish	1 - 2 days	2 - 3 months
Cooked fish	3 - 4 days	4 - 6 months
Smoked fish	14 days	2 months
Fresh shrimp, scallops, crawfish, squid	1 - 2 days	3 - 6 months
Canned seafood (Pantry, 5 years)	after opening 3 - 4 days	out of can 2 months



**U.S. FOOD & DRUG
ADMINISTRATION**

Alert Instantly, Monitor Remotely With Mocreo

However, It is unpredictable that freezer or refrigerator failures occur outside of working hours, including between shifts or overnight. Meanwhile, even though during the working time, as a restaurant manager, your spirit is limited and you have different jobs to do so it is impossible for you to inspect the devices at any moment. When a chef found the freezers too warm, It is so late that some of the food already had become spoiled .

At those situations, what would happen for restaurant?

Restaurant manager has no choice but to dispose of the spoiled food and has to hurry to the grocery store to repurchase the new ones, which aren't always available.

it slows down service time and restricts what menu items will be available to customers

restaurant manager has to spend extra cost and close restaurant temporarily for repairing the coolers

Restaurant manager would be fined due to violating the food safety regulations

Waste the Food...

The Mocreo logo features the brand name in a sans-serif font, with 'MO' in black and 'creo' in a light green color. A registered trademark symbol (®) is positioned to the upper right of the 'o' in 'creo'.

MOCreo®

Wireless Temperature Sensor with External Probe



Track Temperature (-40°F~257°F)



Accuracy: $\pm 0.5^{\circ}\text{C}$



Rechargeable - 2+ years battery life



Instant App/Email Alert

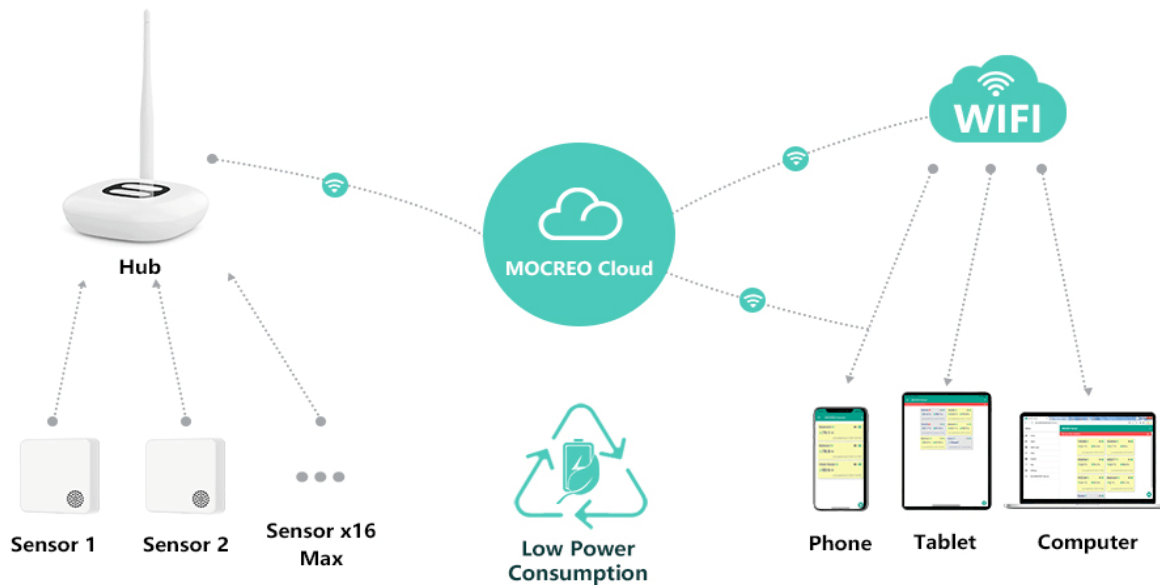


With Mocreo, it provides a temperature & humidity monitoring system to peace of mind. It keeps an eye on your freezers and foods. With real-time monitor and instant alert, it helps you track the foods stored at a constant temperature. Additionally, it alerts you immediately when temperature is change suddenly. By doing so, it meets the food safety requirements and saves restaurant cost as well as enhances satisfaction of your customers with safe and high-quality meals.

Real-time Temperature & Humidity Monitoring System For Restaurant

How the Mocreo Solution Works

Mocreo real-time temperature & humidity system includes wireless sensors, hubs and Mocreo app.



The restaurant manager can preset the temperature that he wants to be notified in time and then places some wireless sensors in the freezers. The hub take bridge between sensors and app. The sensors would automatically record the temperature data and then the hub would sent the data to app. Hence, manager will be notified in time by app notification, e-mail or beeping on the hub when the temperature is out of normal range. In this way, manager can alert staffs to take timely action before potential issues become the serious issues.

Each sensor can work last for **more than 2 years** on average before the next charge. Use a hub to connect the network make the whole system connection more stable and secure as well as multiple sensors are easy to manage.

The benefits

Remote Monitor & Accurate data

Build-in the Swiss-Made Sensor chip (SHT30), MOCREO Sensor provides you with the accurate value. Staffs can always know temperature and humidity conditions of a refrigerator anywhere



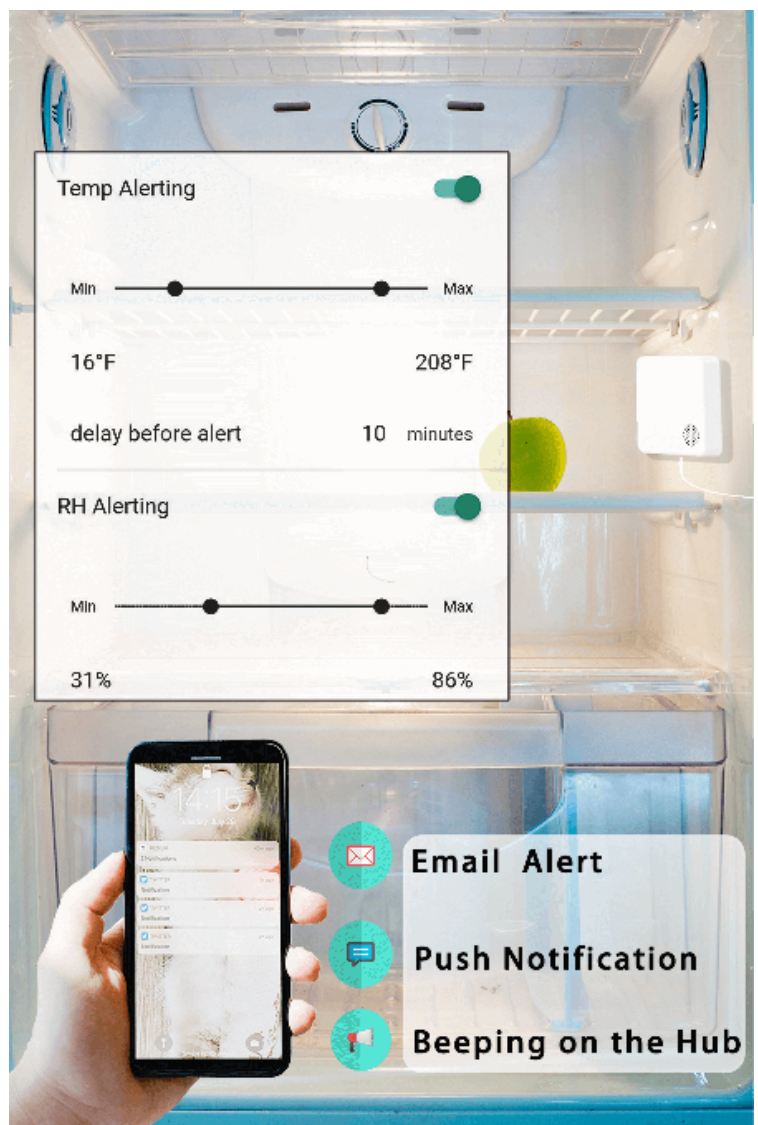
at any time even though staffs are outside of working hours.

That means it can remotely monitor the temperature range in the appropriate zone to maintain the freshness and quality of foods to provide high-quality and safe foods for customers.

Instant Alert

Notifies you through app notification, email alert, beeping on the Hub when temperature & humidity exceeds the set value.

Alert restaurant staffs in minutes when there is any abnormal temperature fluctuation due to without being closed properly, sudden malfunction or power outage. Push them to take action in time before foods become spoiled and then avoids wasting the food and save the extra cost.



Multi-Device Access

It's easy for multiple users or devices to log into the same account and monitor and get alerts, which means all staffs can monitor the temperature & humidity together, thereby enhancing the monitoring strength for refrigerators to some extent.



Multiple Occasions & Easy Installation

Single hub supports up to 16 sensors to be connected at multiple occasions. Restaurant manager can deploy hub with the wireless sensors any location where you want to monitor the temperature.

If your restaurant has different locations, our temperature & humidity monitoring system is your **ideal scalable solution**.

MOCREO®

- ◆ Protocol Supported: Wi-Fi, BLE, ZigBee, LoRa, NB-IoT, LTE-M, SyncFi (self-developed protocol)
 - ◆ Contains rechargeable battery with multi-year battery performance
 - ◆ Predictive insights that drive optimization and new revenue opportunities
 - ◆ Built with cloud-based enterprise-level software platform with network, sensor, security and data management
 - ◆ Completely cloud configurable hardware (no need to change device Firmware)
 - ◆ Easy third-party Sensor/Device and machine interfacing and integration through server-side sensor management system
 - ◆ Over-the-Air (OTA) updates and device diagnostics
- Supported by a full IoT security stack, power and device management and Data-as-a-Service out of the box



Real-time Temperature & Humidity Monitoring System For Restaurant



“MO” means “mobile” and “CREO” originates from a Latin word meaning “to create or make”. Headquartered in San Francisco, we are committed to combining IoT technology with various industries, like restaurants, hospitals, laboratories, pharmacies, etc. With Mocreo, our temperature & humidity monitoring system facilitates you to inspect the “things” you want to monitor. Our goal is to simplify anything, intelligentize anything and save your time and money.

MOC

CREO

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PST 9:30am-6:30pm, Mon to Fri

<https://mocreo.com/>