



pH of Hot Sauce

Description

Although ketchup and mayonnaise are the kings of condiments, hot sauce has been steadily gaining attention in the eyes of consumers. Hot sauce, also known as chili sauce or pepper sauce, is a spicy condiment made from chili peppers. The history of hot sauce runs deep; evidence for chili peppers as condiments has been found as far back as 6000 years ago in the Americas. Since its discovery by colonists, the chili pepper has spread far and wide. Now, nearly every region of the world has a condiment made from the pungent pepper.

Although the variations of hot sauce is endless, all sauces contain at least one variety of chili pepper. The sauce might be vegetable-based with chilies added for heat, or chili-based for a more chili-forward flavor. Other spices and flavorings may also be included, such as garlic, black pepper, and mustard oil. In nearly all cases, these sauces have acidic ingredients added to provide a sharp, tart flavor. Most often, the acid addition is in the form of vinegar (acetic acid), but citrus juices can be used to replace or supplement the vinegar. The presence of acid helps to preserve the sauce, guarding against oxidation and microbial growth. Preparing sauces in this manner allows the sauces to be shelf-stable; sauces without acid would have to be refrigerated during storage.

Foodstuffs acidified with additional ingredients have guidelines set by the Code of Federal Regulations (CFR). 21 CFR Part 114 defines acidified foods as foods that have a pH above 4.6 that have added acids or acidic ingredients to them. The threshold value set of pH 4.6 set by 21 CFR part 114 is to protect consumers against

Clostridium botulinum, which thrives at pH values above 4.6. *C. botulinum* is known to produce toxins that can cause paralysis and death in low doses, even if the food is cooked. As a result, the CFR guidelines suggest that manufacturers measure pH in order to ensure that the finished product has a pH less than 4.6 and that the product is safe to sit on shelves. The guidelines provide several technologies for testing pH, such as pH paper, indicator dyes, and the potentiometric (meter and electrode) method. However, the potentiometric method is most often preferred due to its accuracy, especially when the pH of the food substance is above pH 4.0, where any amount of error can be the difference between life and death. As the pH of hot sauce varies widely based on the recipe (sometimes near the critical value), it is imperative to get accurate results during production.

Application

A hot sauce company contacted Hanna Instruments for a pH meter to replace their old pH tester. The tester had been working well for them but since they were expanding production, they wanted a meter with more accuracy and resolution. The technical sales representative offered the **HI98161** Professional Foodcare Portable pH Meter. The customer appreciated that the HI98161 is waterproof and durable, which gave him confidence in investing in a more advanced meter. Because the customer had some sauces that were in the pH range of 4.1-4.3, they wanted to be confident in their meter's accuracy in this critical range to ensure shelf stability of their product. The customer was pleased with the CAL Check™ of the HI98161, which provided calibration reminders and clearly displayed the electrode condition on the

measurement screen after each calibration. CAL Check definitely assured the customer that their calibration was valid and therefore, their readings were accurate, every time they used it.

The **FC2023** electrode included with the HI98161 was also an attractive feature. Unlike the tester they had been using previously, this electrode is specifically designed for measurements in foods. The clog-resistant open reference junction on the electrode helped them achieve faster response times. Additionally, the PVDF body on the electrode made the customer more confident that the electrode would not shatter while being on the production line. Overall, the customer found that the meter and electrode added value and provided confidence in their products.

