Analysis of salsa sample for pH value and indicator microorganisms

Report Submitted to Company A by the Ravishankar Lab

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Introduction

The growth of microorganisms in food may lead to either food spoilage or food poisoning. To ensure that the food product maintains its quality and safety during storage, microbiological testing is needed. The Aerobic Plate Count (APC) is used as an indicator of the level of bacteria in a food product and can be used to indicate the quality and spoilage level of the product. Coliforms are a group of Gram-negative, facultatively anaerobic rod-shaped bacteria that ferments lactose to produce acid and gas. Coliforms are indicators of organic, environmental or fecal contamination. Both yeasts and molds cause various degrees of deterioration and decomposition of foods. Hence, it is important to determine the populations of aerobic bacteria, coliforms and yeasts and molds in the finished food product, to predict the shelf-life. The pH of foods is generally used to determine processing requirements and applicability of specific regulations. An appropriate pH of a food product can be critical to ensuring the safety of the product. The objective of the present study was to determine the pH value, APC, coliforms, and yeasts and molds in one salsa sample during 14 days of storage.

Materials and Methods

The Salsa sample was stored at 4°C upon receiving. Samples were taken at Day 0, 7 and 14 to perform the pH and microbiological tests. At each sampling day, twenty-five grams of the salsa sample were weighed into a stomacher bag, and 225 mL of Buffered Peptone Water was added into the sample bag. The bag was stomached for 1 min at normal speed. Serial dilutions were

made in 0.1% peptone water and plated on Tryptic Soy Agar (TSA) for APC enumeration, on Chromagar™ ECC for coliforms enumeration, and on Dichloran Rose Bengal Chloramphenicol (DRBC) agar for yeasts and molds enumeration. The TSA and Chromagar™ ECC plates were incubated at 37°C for 48 h and 24 h, respectively. The DRBC agar plates were incubated at 25°C for 5 days. The colonies on the plates were counted and calculated as colony forming units per gram (CFU/g).

The pH values of the salsa sample were measured using a Fisher Scientific ORION STAR A211 pH meter.

Results

The pH values, APC, total coliforms and yeasts and molds in the salsa sample are shown in Table 1.

Table 1. The pH value, APC, total coliforms and yeasts and molds (CFU/g) in salsa sample

Test done	Day 0	Day 7	Day 14
pH value	4.25	4.20	4.10
APC	1.70×10^3	2.50×10^3	3.10×10^3
Total Coliforms	20	<10*	<10
Yeasts and molds	46	70	180

*The detection limit of coliforms for this protocol was 10 CFU/g.

The pH value of the salsa sample kept constant during the 14 days of storage. The APC maintained at a constant level (ca. 10^3 CFU/g) with small variations. Low level of coliforms was found at Day 0, but the population was reduced to below detection limit at Days 7 and 14. The

possible reason for the reduction might be that they couldn't survive due to the low pH condition during the storage. Low level of yeasts and molds was detected at Days 0 and 7, and their population slightly increased at Day 14. Modifying the process parameters to reduce the population of yeasts and molds as well as APC will help improve the product stability and shelf-life.

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