ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 12, Issue, 10, pp.14086-14088, October, 2020

DOI: https://doi.org/10.24941/ijcr.39972.10.2020

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

RESEARCH ARTICLE

STORAGE STUDIES ON THE QUALITY OF SWEET AVOCADO FRUIT SPREAD

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ARTICLE INFO

Article History:
Received 29th July, 2020
Received in revised form
17th August, 2020
Accepted 04th September, 2020
Published online 30th October, 2020

Key Words:
Acidity, Peroxide Value, Moisture, Microbial Count.

ABSTRACT

The study was carried out the objective to study the shelf stability of Sweet Avocado Fruit Spread stored at different packaging materials at ambient and refrigerated temperature for a period of 4 weeks. Changes in Acidity, Moisture, Peroxide Value, Microbial Count were investigated. The acidity, moisture, peroxide value and microbial count observed higher in Sweet Avocado Fruit Spread stored in polyethylene bags at ambient temperature. The lowest content was observed in sweet avocado fruit spread stored in glass bottle at refrigerated temperature. Yeast and fungal colonies was found higher in fruit spread kept in polyethylene bags compared to glass and plastic bottle.

Citation: ***Mary Gay L. Labrado, Ike Paul Q. Labrado, Emily C. Rosal, Analiza B. Layasan and Esmeralda S. Salazar.*** **2020.** "Storage studies on the quality of sweet avocado fruit spread", *International Journal of Current Research*, 12, (xx), xxx-xx.

INTRODUCTION

Persea americana. Mill, commonly known as avocado pear, is an evergreen tree belonging to the family Lauraceae. It is a tropical tree native to Mexico, Central America and South America but it is now grown worldwide (Duester, 2000). Avocados are a delicious and unique fruit that offer a range of benefits when consumed. The avocado is a unique fruit ,while most fruits primarily consist of carbohydrates, avocado is high in healthy fats. This fruit is prized for its high nutrient value and is added to various dishes due to its good flavor and rich texture. It is the main ingredient in guacamole. Phytosterols are present in avocado whose structure is very similar to cholesterol and it inhibits intestinal cholesterol absorption and decreases hepatic cholesterol synthesis (Chia & Dykes, 2010). The edible fleshy part of avocado is most nutritious of all salad fruits and served as a salad vegetable. Avocado can also be eaten raw or on bread and sandwich filling (Fulgoni *et al*., 2010). Jacob and Brenes (2013), reported that the avocado is characterized by an attractive color, a distinguishing texture, and an exquisite flavor and aroma.

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All these sensory attributes are closely related to its eating quality, which increases as the fruit ripens, and some of them are used for consumers as a guide at purchasing time. Obenland *et al*. (2014) reported that the higher fruit likeability was achieved for ripe avocados, which presented creamy, smooth and buttery texture with nuttiness and a minimum of grassy flavour. The minimally processed avocado product will provide conditions that are ideal for the growth of spoilage bacteria. Since these food products are ready to eat, microbial growth must be strictly controlled.. The commonly used preservative techniques are traditional technologies like thermal treatments and chemical preservatives which reduce microbial load but can lead to the generation of bitter off-flavours.

MATERIALS AND METHODS

The methodology is discussed under the following headings

- Selection of Avocado Fruits
- Processing of Sweet Avocado Fruit Spread
- Shelf life studies of Sweet Avocado Fruit Spread

Selection of Avocado Fruits: Purple Hybrid, common cultivar found in the households of Wayanad District was selected for the study.

Table 1. Changes Acidity Content of Sweet Avocado Fruit Spread during Storage (%)

Storage condition		Initial	1st week	2nd week	3rd week	4th week
Glass bottle	Ambient condition	0.002	0.010	0.011	0.012	0.013
	Refrigerated condition	0.002	0.006	0.011	0.012	0.014
Plastic bottle	Ambient condition	0.002	0.013	0.013	0.015	0.016
	Refrigerated condition	0.002	0.014	0.015	0.015	0.017
Polyethylene bag	Ambient condition	0.002	0.012	0.018	0.026	0.026
	Refrigerated condition	0.002	0.017	0.018	0.019	0.020
CD(0.05)		-	0.007	0.004	0.005	0.001

Table 2. Changes in Moisture Content of Sweet Avocado Fruit Spread during Storage (%)

Storage condition		Initial	1st week	2nd week	3rd week	4th week
Glass bottle	Ambient condition	42.33	55.00	56.33	63.00	67.90
	Refrigerated condition	42.33	44.24	51.95	54.89	56.29
Plastic bottle	Ambient condition	42.33	72.23	74.38	75.55	78.71
	Refrigerated condition	42.33	61.31	62.32	68.94	69.31
Polyethylene bag	Ambient condition	42.33	72.54	73.31	74.25	76.51
	Refrigerated condition	42.33	71.45	72.21	72.58	73.36
CD(0.05)		-	5.83	3.44	1.37	0.28

Table 3. Changes in Peroxide Content of Sweet Avocado Fruit Spread during Storage (%)

Storage condition		Initial	1st week	2nd week	3rd week	4th week
Glass bottle	Ambient condition	1.96	3.40	8.46	12.36	16.40
	Refrigerated condition	1.96	2.90	5.20	8.20	10.13
Plastic bottle	Ambient condition	1.96	4.23	10.33	14.13	16.20
	Refrigerated condition	1.96	2.26	5.33	8.53	12.20
Polyethylene bag	Ambient condition	1.96	4.33	9.40	17.60	19.26
	Refrigerated condition	1.96	3.23	9.03	17.60	19.26
CD(0.05)		-	0.35	0.60	0.43	0.37

Processing of Sweet Avocado Fruit Spread: The avocado fruit were collected and washed under running water and it was cut in to halves. The pulp was taken out by pitting and scooping and blending well using a blender. The Ingredients namely Sugar, Cocoa Powder, KMS, Citric acid were added and thoroughly mixed in to the puree.

Shelf life studies of Sweet Avocado Fruit Spread: The spread was then poured in to glass bottles, Plastic bottles and Polyethylene bag at ambient and refrigerated temperature. The shelf life of the developed fruit spread was evaluated at weekly intervals up to one month in terms of acidity, moisture, peroxide value and microbial count.

RESULTS

Sweet Avocado Fruit Spread with Pulp (100g): Cocoa powder (30g): Sugar (100g): Citric acid (0.1g) and KMS (0.25g) was selected as the superior blend. The stored avocado spreads was assessed for the presence of various microorganisms such as bacteria, fungi and coliform and initially and at one week interval up to one month. This was done by serial dilution and pour plating method suggested by Sackett *et al.,* (2010). Storage qualities in terms of moisture content, peroxide value, acidity and microbial growth of each of the avocado spread were recorded at weekly intervals. Microbial Profile of bacteria, fungi, yeast was determined using nutrient agar, eosine methylene blue. From the microbial evaluation it was revealed that bacterial, fungal and colonies were present in the sample.

The acidity content was observed higher in sweet avocado fruit spread stored in polyethylene bags at ambient temperature (0.026%),the lowest content of acidity was observed in sweet avocado fruit spread stored in glass bottle at refrigerated temperature (0.013 %). The moisture content of the stored sweet avocado fruit spread gradually increased during storage period. The statistical data showed that the moisture content of developed sweet avocado fruit spread varied from 44.2 to 72.5 percent during the first week period. The highest moisture content was recorded for sweet avocado fruit spread stored in plastic bottle (78.7%) at ambient temperature. The lowest was observed for sweet avocado fruit spread stored in glass bottles at refrigerated condition (56.29%). The highest peroxide content was recorded for sweet avocado fruit spread stored in Polyethylenge bags at ambient(19.26%) and refrigerated temperature (19.26%).The lowest was observed for sweet avocado fruit spread stored in glass bottles at refrigerated condition (10.13%). The microbial growth is seen within the permissible limit. The bacterial population was found in all containers kept under ambient condition. Fungal colonies was found in the fruit spread kept in glass bottle during 4th week. Yeast growth was recorded nil in fruit spread stored in glass bottle. Yeast and fungal colonies was found higher in fruit spreads kept in polyethylene bags compared to glass and plastic bottle. During the storage period in refrigerator, bacterial colonies were found to appear in developed sweet avocado fruit spread. Fungal colonies was found to be higher in fruit spread kept in polyethylene bag. Yeast growth was recorded nil in fruit spread stored in glass bottle.

Conclusion

In order to increase commercialization on a larger scale and give avocado an added value, it is important to develop food products derived from this fruit with a long enough shelf-life to assure their transportation and distribution to consumers. Improving the shelflife of a fruit is, in most cases, a result of improving its storage life.

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