

INVESTIGATION OF MICROBIOLOGICAL GROWTH IN FRESHLY SQUEEZED ORANGE JUICE



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ÖZET

Portakal suyu, kimyasal bileşenleri ve antioksidant özelliği sayesinde beslenmemizde önemli bir yere sahiptir. Portakal suyu üretimi sırasında ısısal işleme tabii tutulduğundan, üründe besin kayıpları oluşmaktadır.

Sağlık riskleri taşımayan güvenli ürünler oluşturmak ve ürünün raf ömrünü uzatmak için yeni teknolojiler üzerinde çalışılmaktadır. Isısal işlemler ve kimyasal katkıları ürünün tadında ve şeklinde tüketiciyi rahatsız eden bir takım değişikliklere sebep olabilir.

Bu çalışmada taze sıkılmış portakal suyu 20 gün boyunca 5 değişik sıcaklıkta (0 C, 4 C, 14 C, 20 C, 24 C) steril plastik şişelerde depolanmıştır.

Bu zaman sürecinde mikrobiyal parametreler (*E.coli* O157: H7, *Salmonella* spp., *Listeria monocytogenes*) incelendi ve 20 gün sonunda 0 C, 4 C, 14 C, 20 C, 24 C de *Salmonella* spp., ve *E. coli* de 7,7,2,,1 ve 1 günlerde üreme tespit edildi.

Listeria monocytogenes hiçbir numunede izole edilmedi.

SUMMARY

Fruit juice, due to their chemical composition and antioxidant value, have a very important place in nutrition. Fruit juices are mostly subject to thermal processes during production and these processes cause nutritional loss in the product.

New technologies are being developed for increasing the shelf life and quality of the fruit juices to obtain safe products that do not present health risks. Although the products processed through chemical additives and thermal processes may show differences as to the shape, taste etc than the original ones which disturb the consumer.

In this research, freshly squeezed orange juice was stored in sterilized plastic bottles. Samples were stored at five different isothermal conditions, (((0C, 4 C, 14 C, 20 C, 24 C) for 20 days.

During this period, microbial parameters (*E.coli* O157: H7, *Salmonella* spp, *Listeria monocytogenes*) were investigated and it was detected that no growth was observed with *Salmonella* spp and *E.coli* at 0 C, 4 C, 14 C, 20 C, 24 C in 7,7,2,1 and 1 respectively, but no growth of *Listeria monocytogenes* were estimated at the end of 20 days storage.

INTRODUCTION

Due to its high acidic value, freshly squeezed orange juice is accepted as safe for pathogenic microorganisms. But to prior production, due to non conforming storage and cleaning food poisonings may occur.

Microbial contamination on fruit peel is the most important factor that causes microbial quality and safety of freshly squeezed orange juice.

Since the microorganisms pass into the orange juice during extraction, the microbial load on the peel is very important. The pathogenic load of the peel affects the health risk of the orange juice.

The microbial load changes as 1.3-5.3 log kob/ml.

Since the fresh orange juice does not include any pathogen killing process, a disinfection is needed.

Non conforming disinfection and washing cause *Salmonella typhii* growth.

Endemic food poisonings may also occur. In 1999, *Salmonella enterica* serotype Muenchen contaminated fresh orange juice caused food poisonings in USA and Canada. 400 people had *Salmonella typhimurium* contaminated orange juice food poisonings in 1999 in South Australia.



MATERIAL AND METOD

Fruits are bought from the sales point, washed first with pure water and then 70% ethanol in water solution. Then squeezed with sterilized equipments and stored in five different temperatures in sterilized plastic bottles.

In this research, Choromagar 0157, Choromagar *Listeria* and Choromagar *Salmonella* ready growth medias are used.

In every 2 days, 1 ml of stored orange juice for each temperature are planted into *Salmonella* spp., *E.coli* and *Listeria monocytogenes* selective growth media, incubated at 37 C oven for 24 to 48 hours and suspicious colonies are counted. Suspicious colonies are also identified which were given on the following results.

RESULTS

Analysis	Storage Temperature Degree °C	%	DURATION OF ANALYSIS - DAY									
			D	0	2	4	7	9	11	13		
MB	0	<i>Salmonella</i> spp.		0	100	0		0	4	15		
MB	0	<i>Listeria monocytogenes</i>		0	0	0		0	0	0		
MB	0	<i>E. coli</i>		0	225	0		0	200	0		
MB	4	<i>Salmonella</i> spp.		0	0	1		0	35			
MB	4	<i>Listeria monocytogenes</i>		0	0	0		0	0			
MB	4	<i>E. coli</i>		0	0	2		0	6			
MB	14	<i>Salmonella</i> spp.		0	0	22						
MB	14	<i>Listeria monocytogenes</i>		0	0	0						
MB	14	<i>E. coli</i>		0	24	25						
MB	24	<i>Salmonella</i> spp.		0	0	7						
MB	24	<i>Listeria monocytogenes</i>		0	0	0						
MB	24	<i>E. coli</i>		0	460	25						
MB	20	<i>Salmonella</i> spp.		0	7	0		<i>Pseudomonas</i>				
MB	20	<i>Listeria monocytogenes</i>		0	0	0		0				
MB	20	<i>E. coli</i>		0	11	0		<i>Pseudomonas</i>				