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Sunday



**Faculty of Agriculture and Veterinary Medicine  
Nutrition & food technology**

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# PRODUCTION OF GREEN THYME UNDER VACUUM



# INTROUDUCTION

- ◉ Thyme was originated from the Mediterranean but is now recognized as one of the most aromatic herbs in the world. It is commonly used in Mediterranean cuisine, adding flavors to meats, vegetables and breads. It thrives in hot conditions, loves full-sun, and doesn't need constant watering or attention.

- This aromatic herb is also a good source of vitamins. They are especially rich in vitamins A and C. Other nutrients found in this herb include vitamins K and E, folic acid, potassium, calcium, iron, manganese, magnesium and selenium.

- Its range of use is impressive, and it has over 400 subspecies. Ancient Egyptians used it in their embalming practices, while ancient Greeks used it as incense.

# PROBLEM

Thyme is available in abundance and has several benefits. It has high demand and consumption by people, but it is seasonal and is not available throughout the year. If it is present, it is frozen which negatively affects its taste, nutritional value and color

In the period of production of green thyme, the consumer must use thyme directly because it is exposed to several problems, including browning and change in taste and nutritional value



The shelf life of available thyme is short and it is non convenient and contains contaminants.

As a result of these problems in fresh thyme and because of the availability of large quantities (overproduction), we thought in this project to produce fresh green thyme properly preserved to preserve its taste, color and nutritional value and increase shelf life

It is ready for direct consumption, saving time and effort due to the nature of working life

# THEORY

One of the problems of thyme damage is oxygen, which helps to browning (enzymatic deterioration) and increases the growth of aerobic bacteria, so the oxygen was withdrawn by the technique of vacuum, which inhibits the growth of aerobic bacteria and prevents the occurrence of browning and

This makes thyme safer on the microbial side and saves it for longer periods of time

And maintains its sensory properties as much as possible



## Vacuum packaging

Is a method of packaging that removes air from the package prior to sealing .

The purpose of the vacuum is to preserve the quality of the product as good and as long as possible ,and to ensure that the taste , color, flavor nutritional value are not lost

Why to use vacuum packaging ?

To remove  $O_2$  from the container to extend the shelf life of the product

The lack of  $O_2$  reduce the amount of spoilage due to oxidation

Minimize growth of aerobic micro organisms

Prevent evaporation of volatile components



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MAP require to flush out air from the package and replace it with a different gas or gas mixture.

The normal composition of air is 21% oxygen , 78% nitrogen and less than .1% co2 .

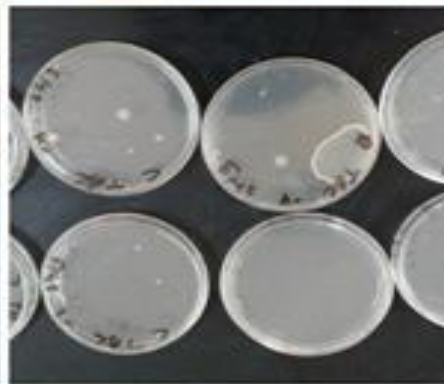
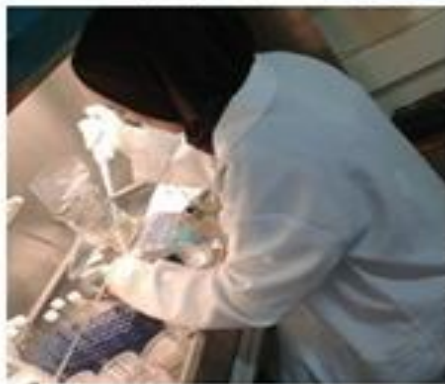
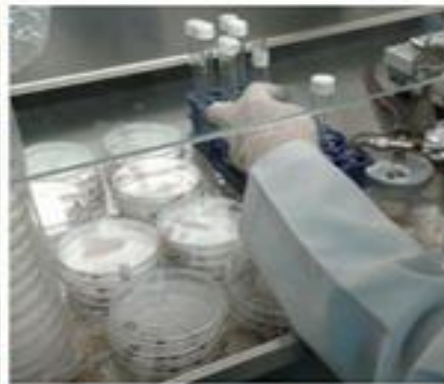
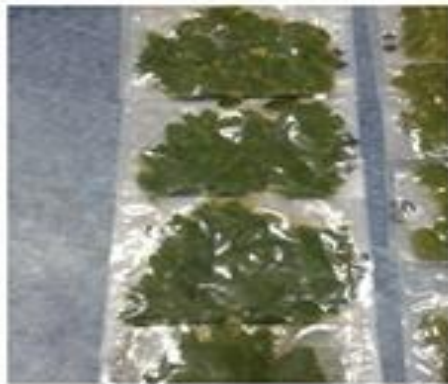
MAP by reducing o2 content , increasing levels of co2 and / or nitrogen ,extend shelf life of perishable food at chill temp .

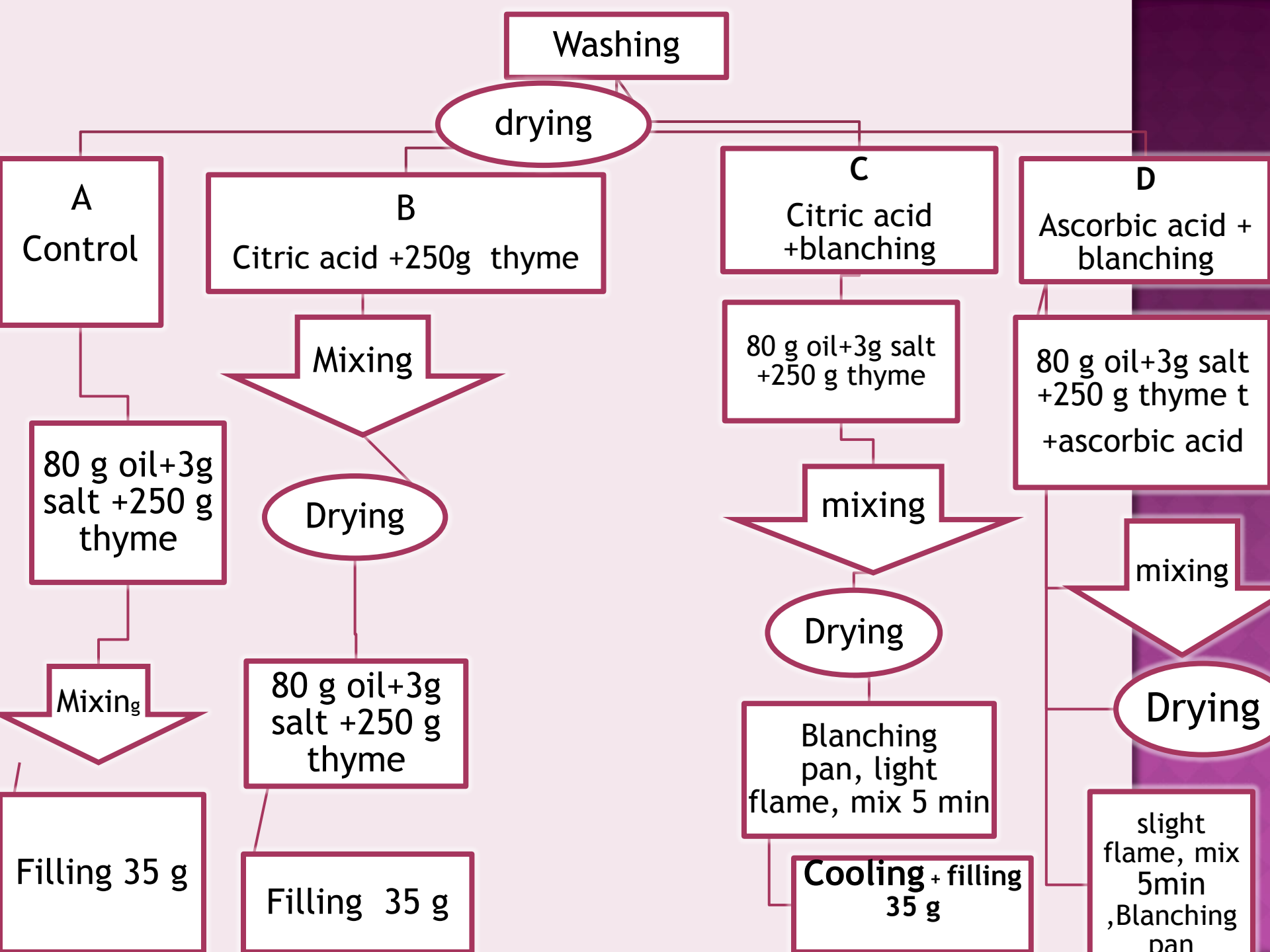


 Modified Atmosphere Packaging



# METHOD

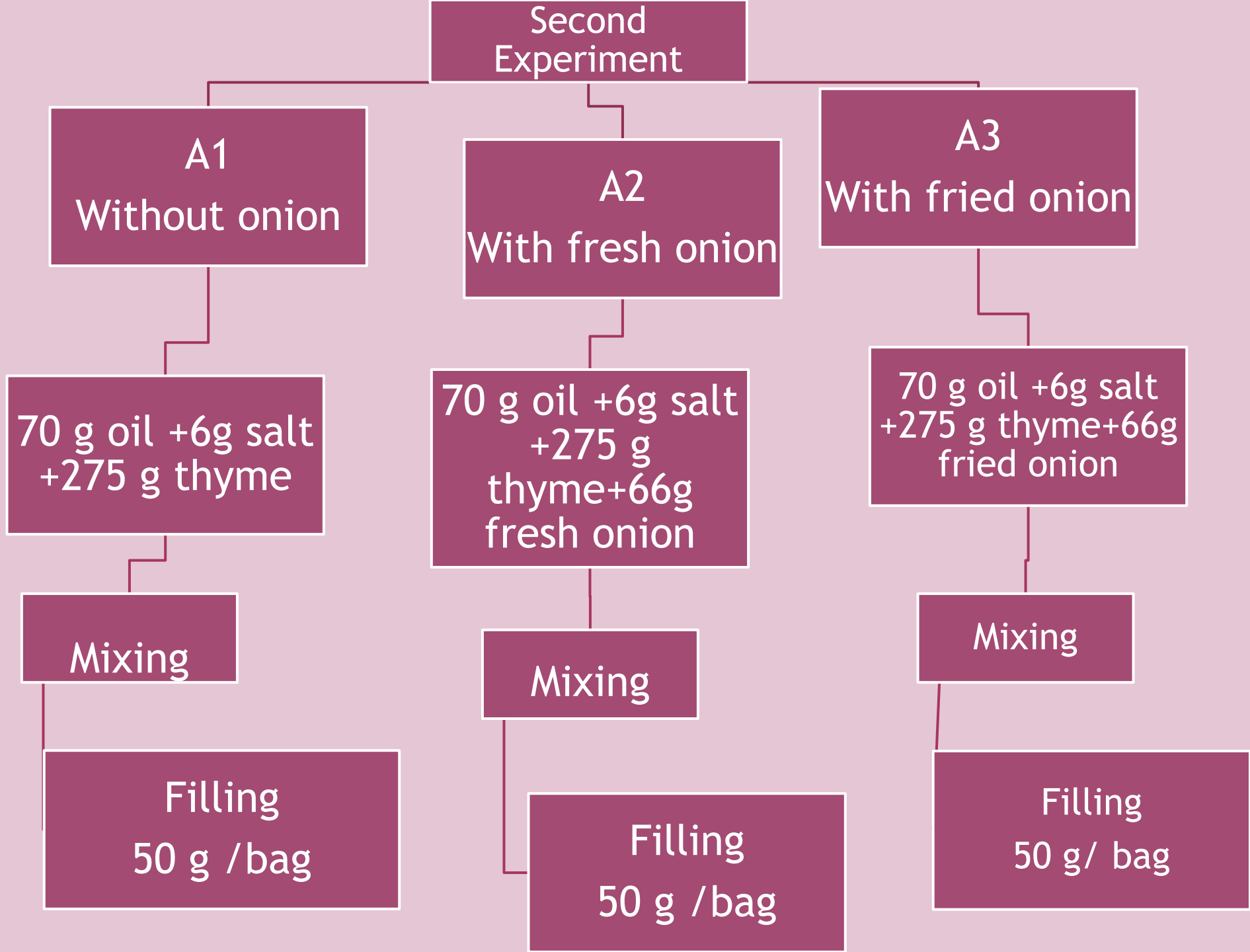




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- Total thyme weight 862 g
  - Thyme weight for every group 278g

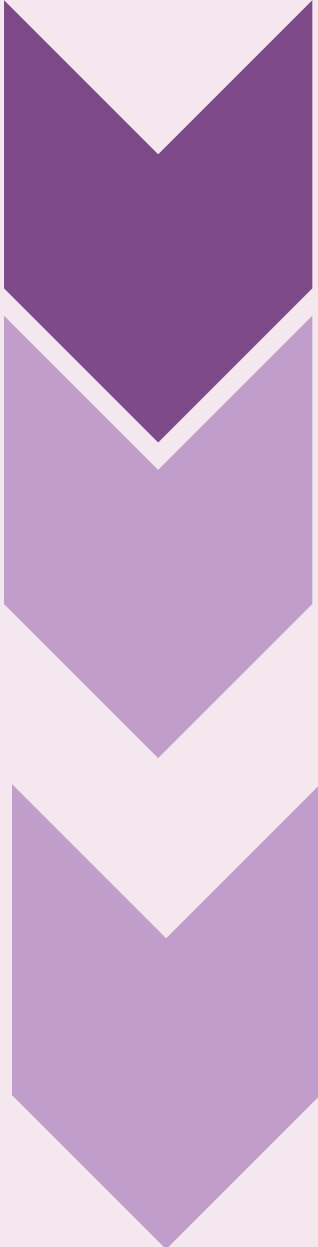
- Total onion weight 347 g
- Salt 2% of the weight of thyme → 6g for each group

- Onion 24% of the weight of thyme → 66 g
- Oil 25% of the weight of thyme → 70 g





# Microbial testing procedures

- 
- 1. Thyme bag was sterilized with alcohol from the outside & opened
  - 2. 10g of the thyme were taken & placed in a special bag

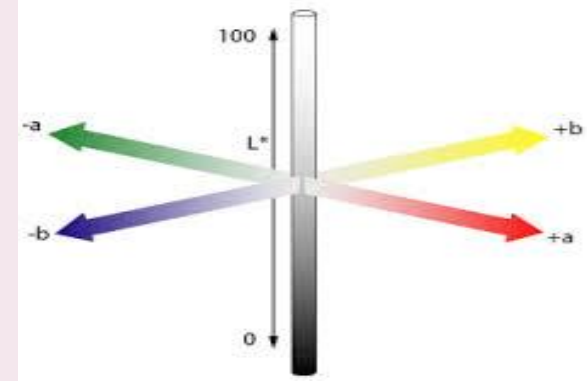
- 3. Peptone water was added until the weight reached 100 g (dilution -1 )
- 4. the bag was placed inside a stomacher for 1 min then different dilutions were prepared .

- 1 ml of each dilution was taken & placed in a Petri dish then the media was poured
- Samples were placed in the incubator
- 35 °c for bacteria for 48 h
- 25 °c for yeast & mold for 3-5 days

# EMPIRICISM

## 1- COLOR

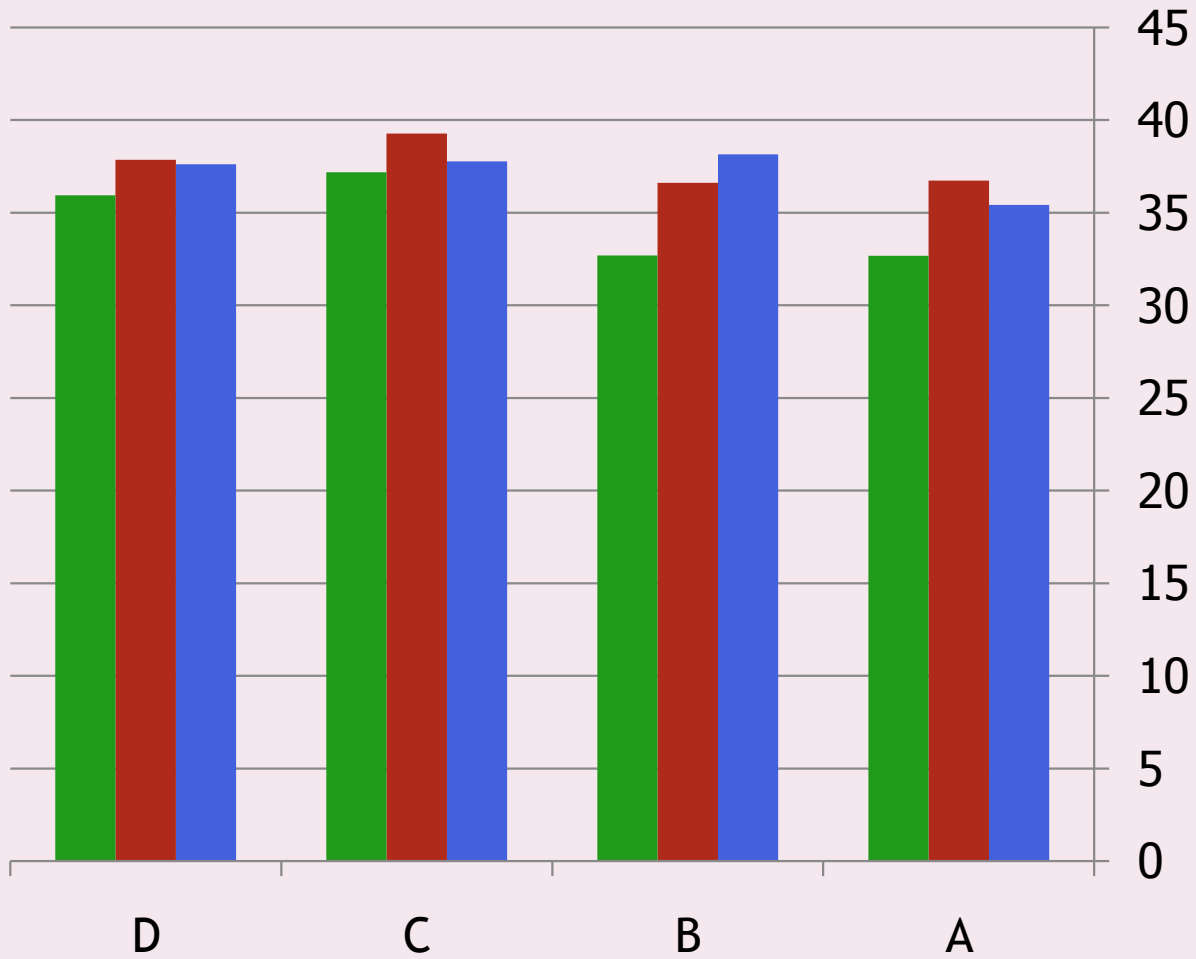
	l			a			b		
	0 day	10 days	20 days	0 d	10 d	20 d	0 d	10 d	20 d
A	32.66	36.72	35.42	-3.49	-5.6	-5.6	5.14	8.68	7.25
B	32.68	36.61	38.15	-4.02	-5.15	-4.57	5.47	10.51	10.21
C	37.17	39.27	37.77	-6.35	-1.69	-0.55	9.55	11.64	10.71
D	35.93	37.85	37.6	-4.03	-4.1	-2.05	6.86	10.73	10.83





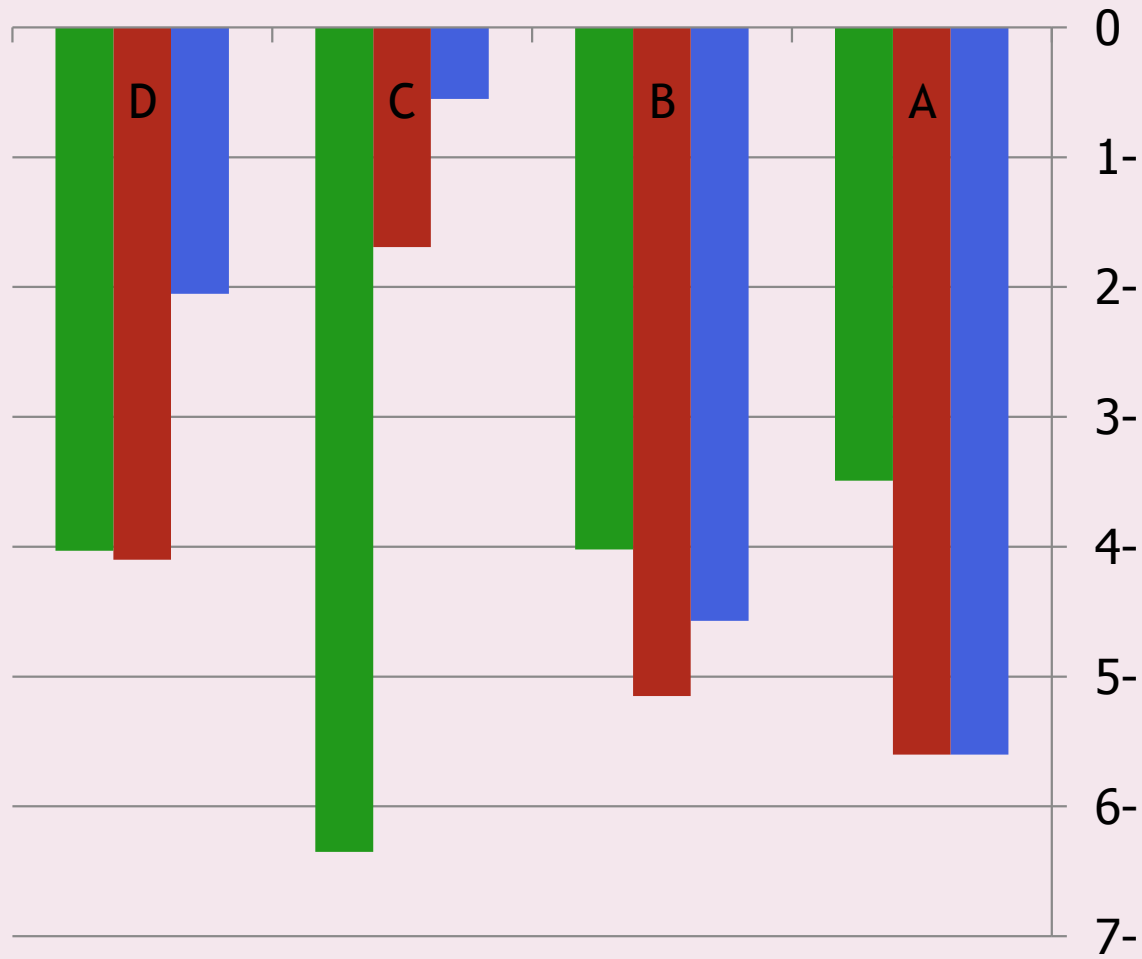
color index

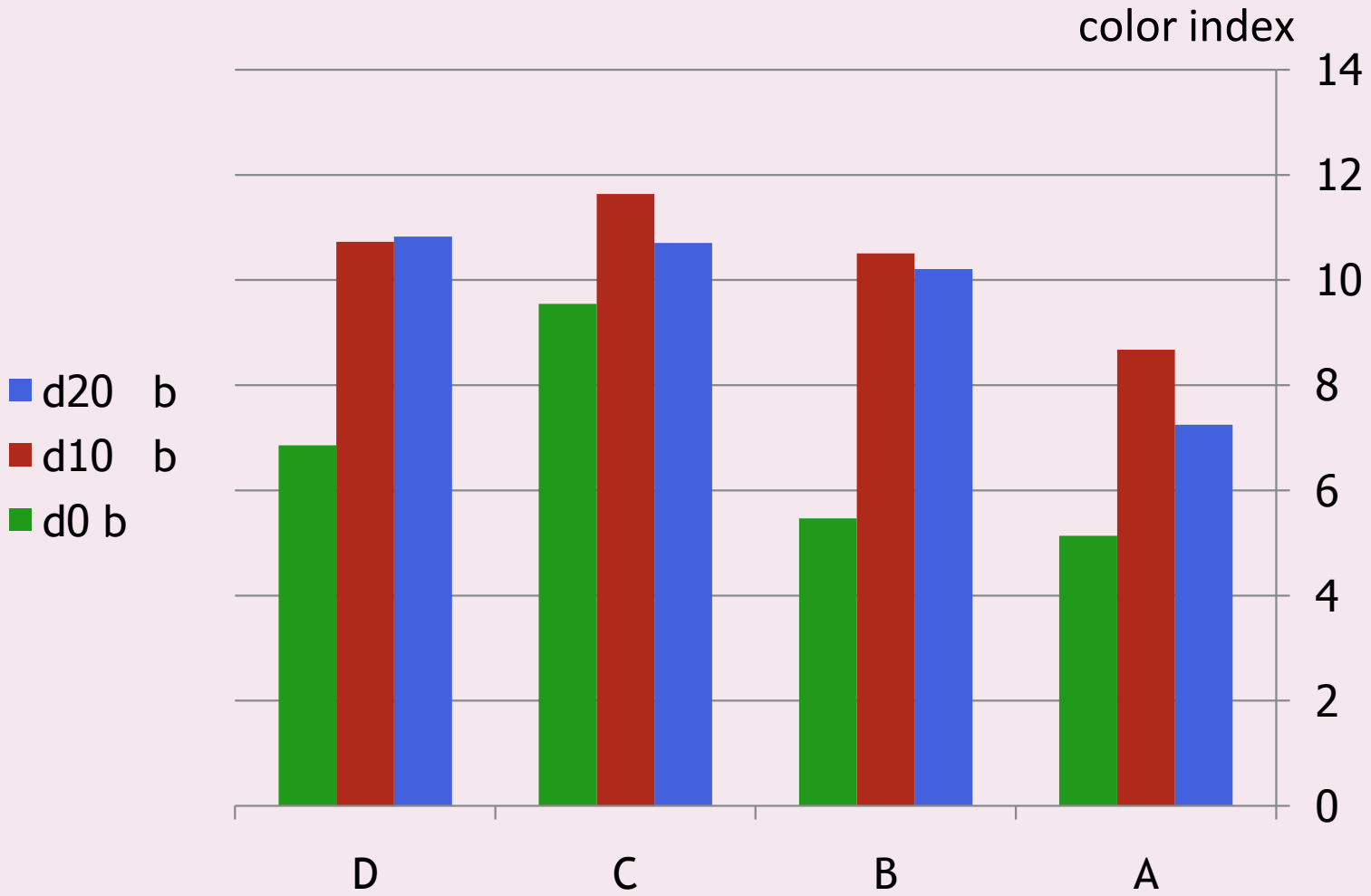
■ days20 l  
■ days10 l  
■ day0 l



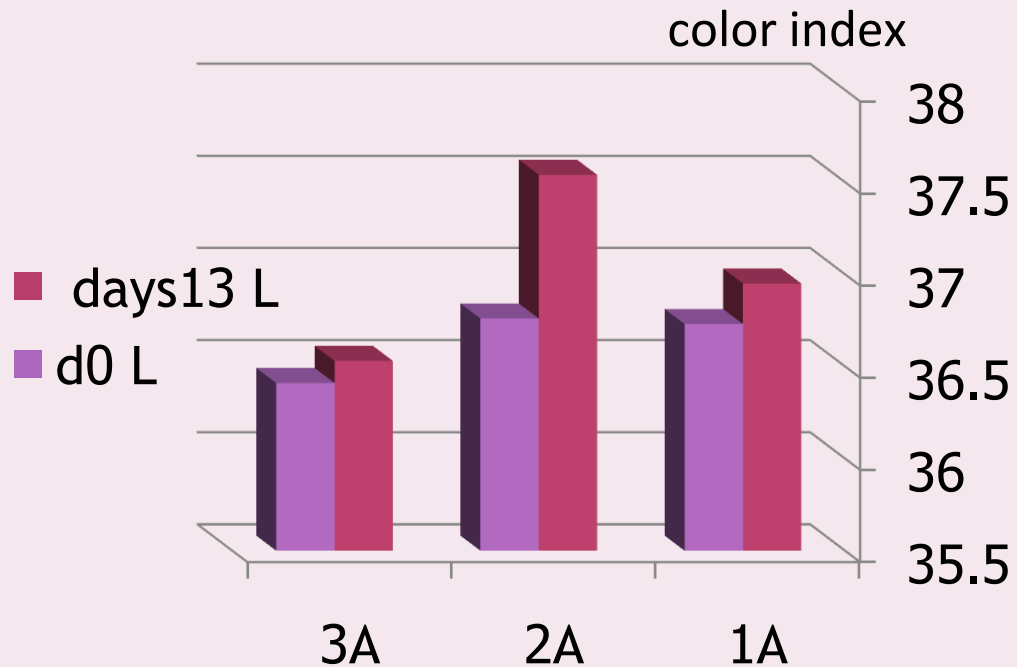
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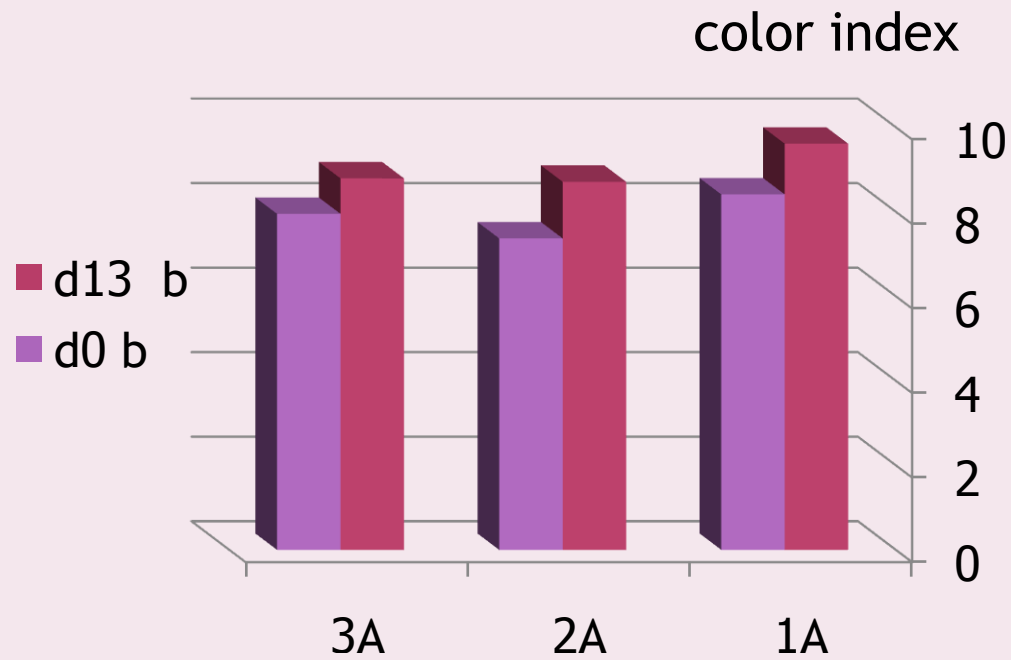
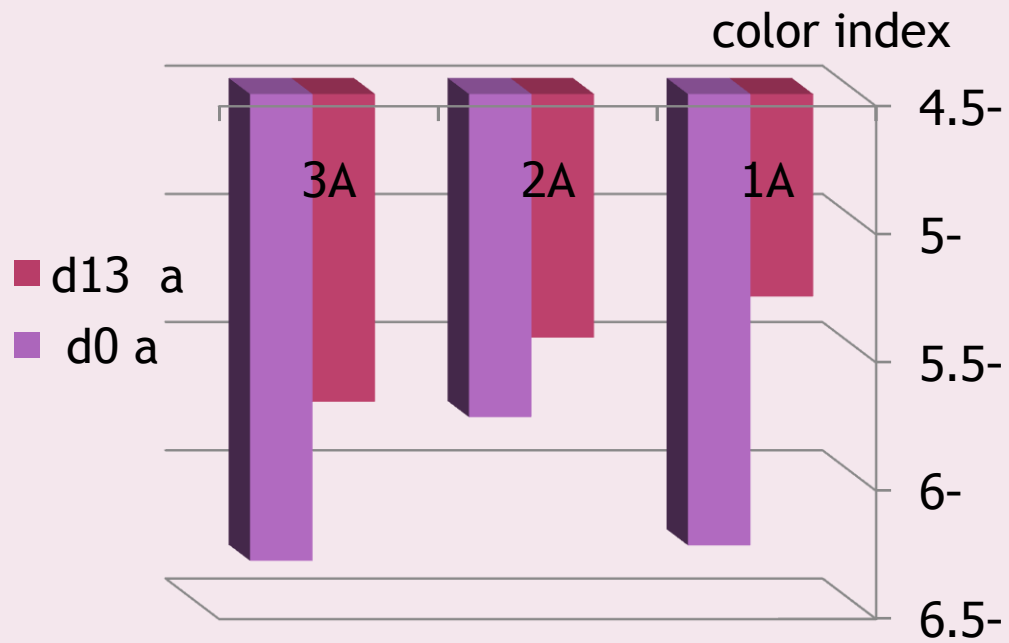
■ d20 a  
■ d10 a  
■ d0 a





	L		a		b	
	0 d	13 days	0 d	13 d	0 d	13 d
A1	36.73	36.95	-6.26	-5.29	8.41	9.61
A2	36.76	37.54	-5.76	-5.45	7.37	8.71
A3	36.41	36.53	-6.32	-5.7	7.95	8.79







# 2- SENSORY ANALYSIS

	Taste	Flavor	Appearance	Saltness	Overall acceptance
A	6.85	6.92	7.07	3	6.85
B	6	6.28	7.07	2.85	6.57
C	5.42	5.28	6.21	2.92	5.28
D	6.07	6.35	7.21	3.07	6.57



Age

Gender: M F

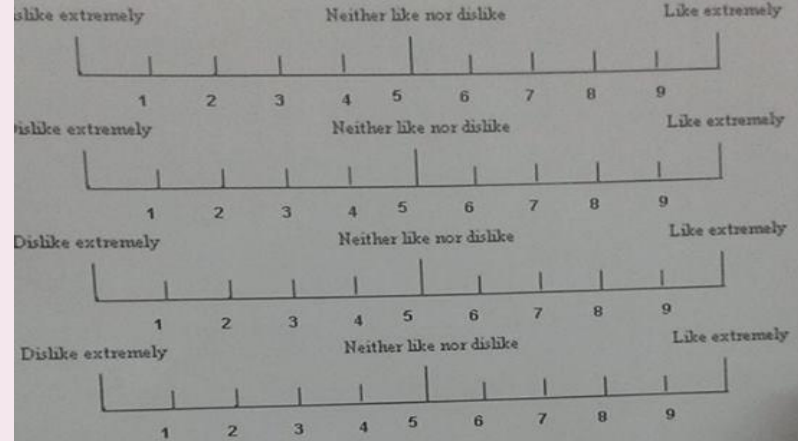
### Hedonic Scale for Evaluating Foods

Scale	Taste	Flavor	Appearance	Saltiness	Overall acceptance	
9						Like Extremely
8						Like Very Much
7						Like Moderately
6						Like Slightly
5						Neither Like Nor Dislike
4						Dislike Slightly
3						Dislike Moderately
2						Dislike Very Much
1						Dislike Extremely

M

F

Age: .....

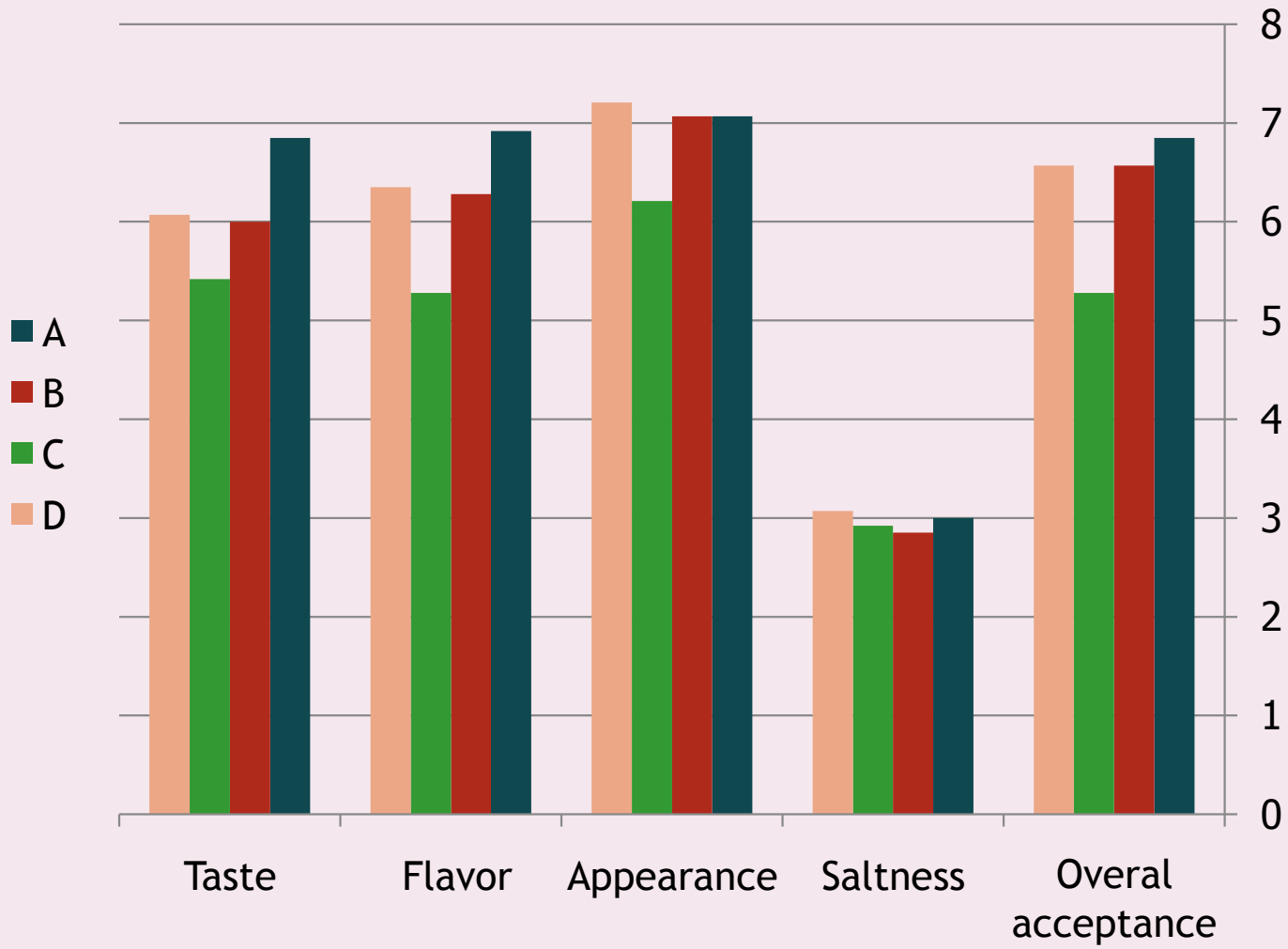


#### Saltiness

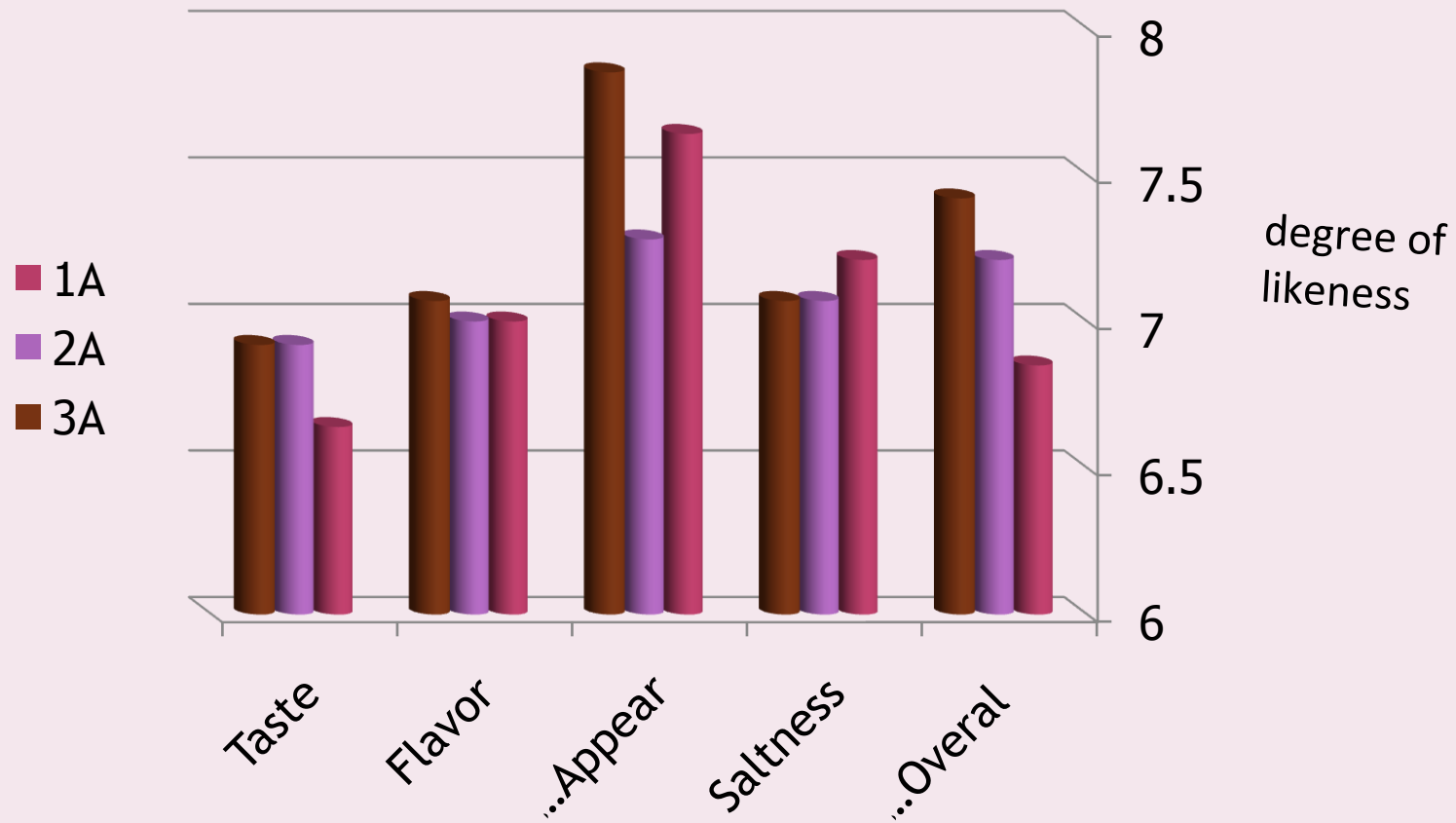
- Very much too salt
- Too salt
- Slightly too salt
- Just about right
- Slightly not salt enough
- Not salt enough
- Very much not salt enough

- 9  Like extremely
- 8  Like very much
- 7  Like moderately
- 6  Like slightly
- 5  Neither like nor dislike
- 4  Dislike slightly
- 3  Dislike moderately
- 2  Dislike very much
- 1  Dislike extremely

degree of likeness



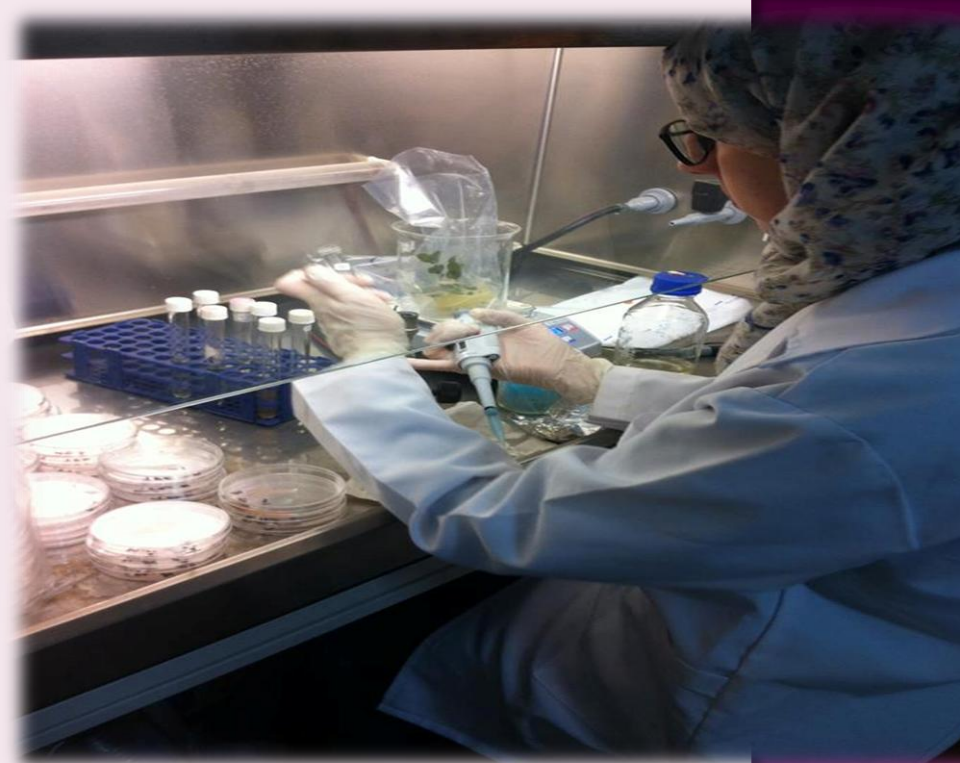
	Taste	Flavor	Appearance	Saltiness	Overall acceptance
A1	6.64	7	7.64	7.21	6.85
A2	6.92	7	7.28	7.07	7.21
A3	6.92	7.07	7.85	7.07	7.42



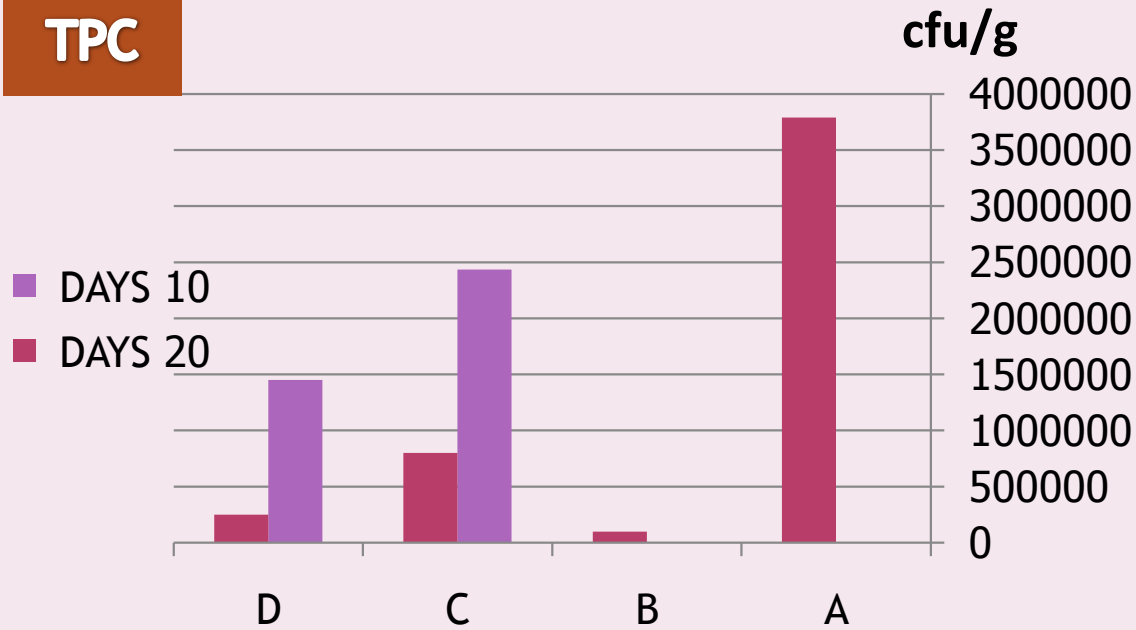
# 3- MICRO

TPC	10 DAYS	20 DAYS
A	$3 \cdot 10^3$	$379 \cdot 10^4$
B	0	$10 \cdot 10^4$
C	$2436 \cdot 10^3$	$80 \cdot 10^4$
D	$1450 \cdot 10^3$	$25 \cdot 10^4$

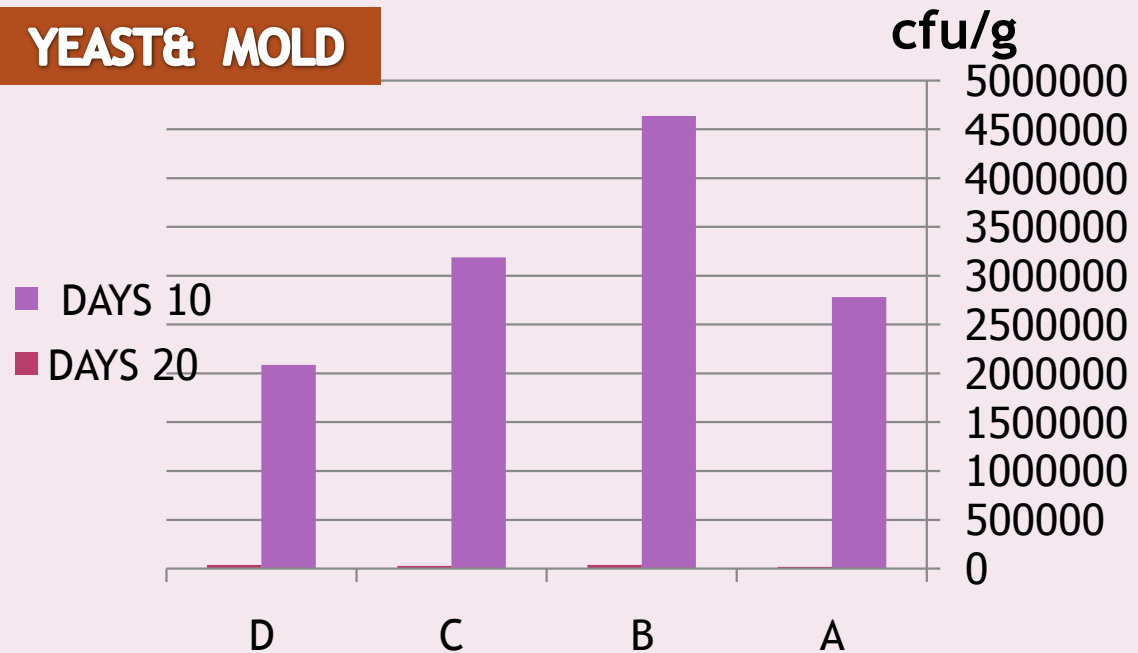
Yeast	10 DAYS	20 DAYS
A	$2784 \cdot 10^3$	$2 \cdot 10^4$
B	$4640 \cdot 10^3$	$4 \cdot 10^4$
C	$3190 \cdot 10^3$	$3 \cdot 10^4$
D	$2088 \cdot 10^3$	$4 \cdot 10^4$



# TPC



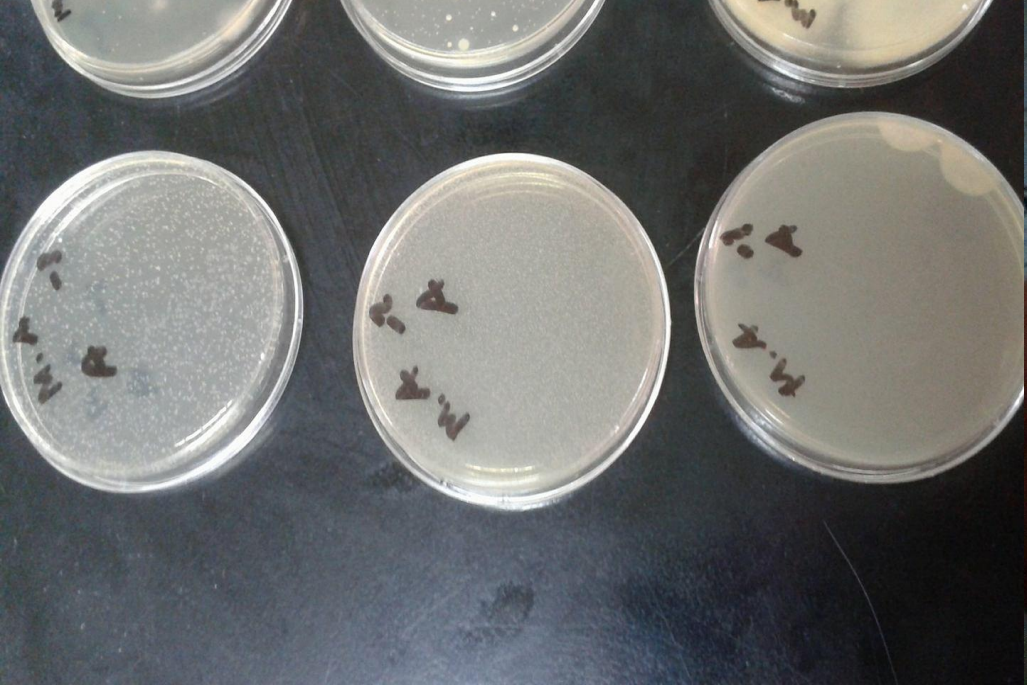
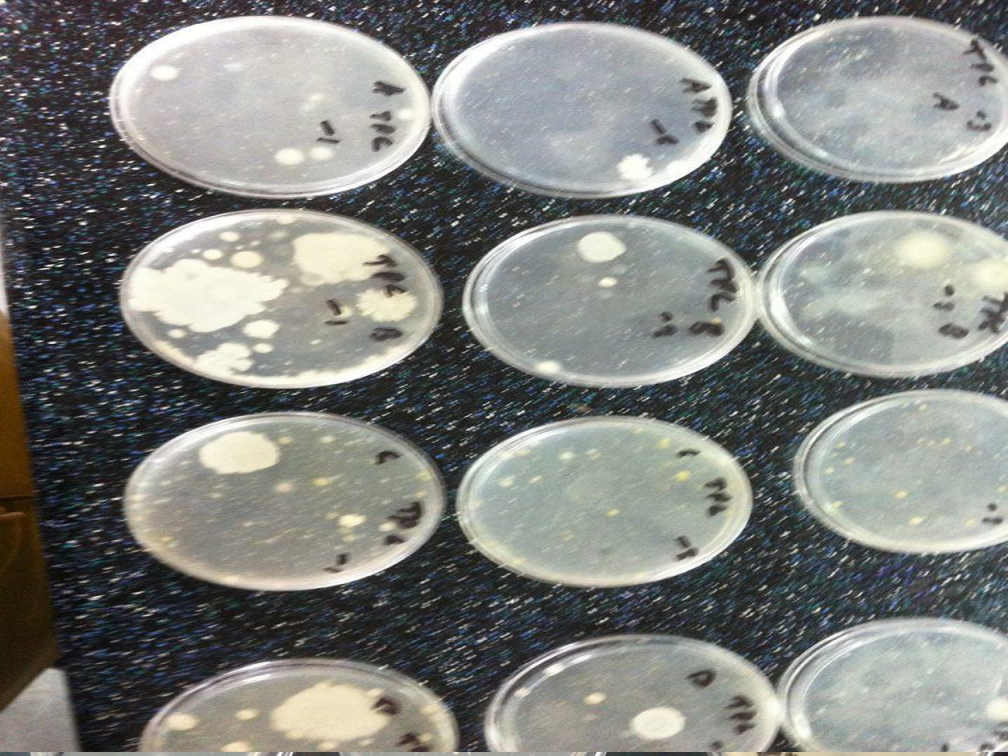
# YEAST & MOLD



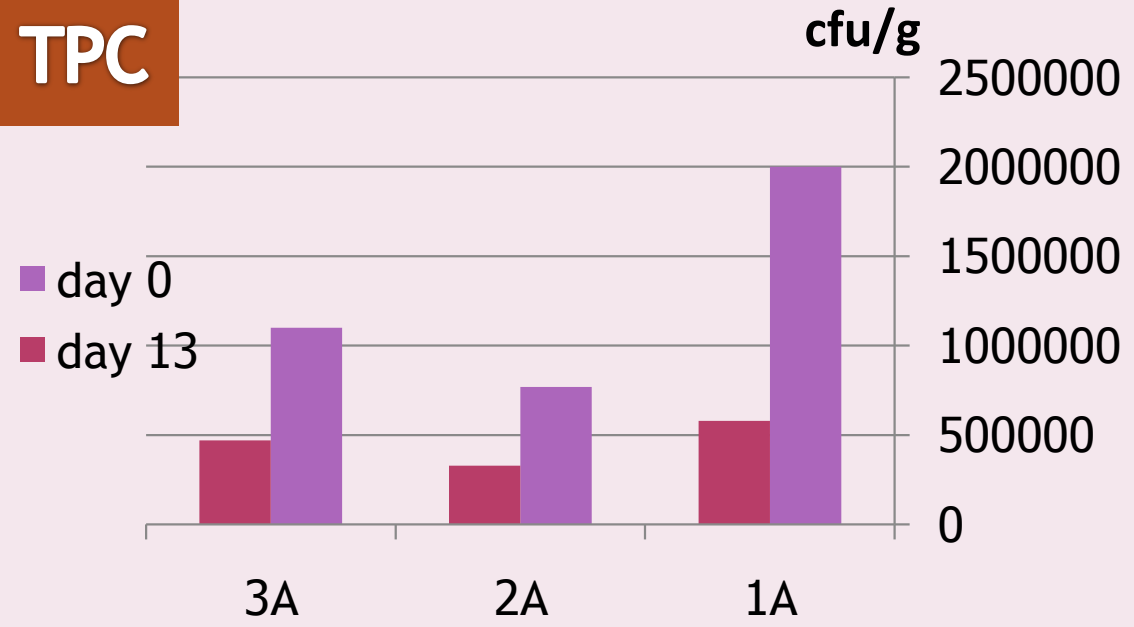
TPC	0 day	13 day
A1	$200 \cdot 10^4$	$58 \cdot 10^4$
A2	$77 \cdot 10^4$	$33 \cdot 10^4$
A3	$110 \cdot 10^4$	$47 \cdot 10^4$

YEAST	0 day	13 day
A1	$10 \cdot 10^3$	$28 \cdot 10^3$
A2	$196 \cdot 10^3$	$20 \cdot 10^3$
A3	$16 \cdot 10^3$	$21 \cdot 10^3$

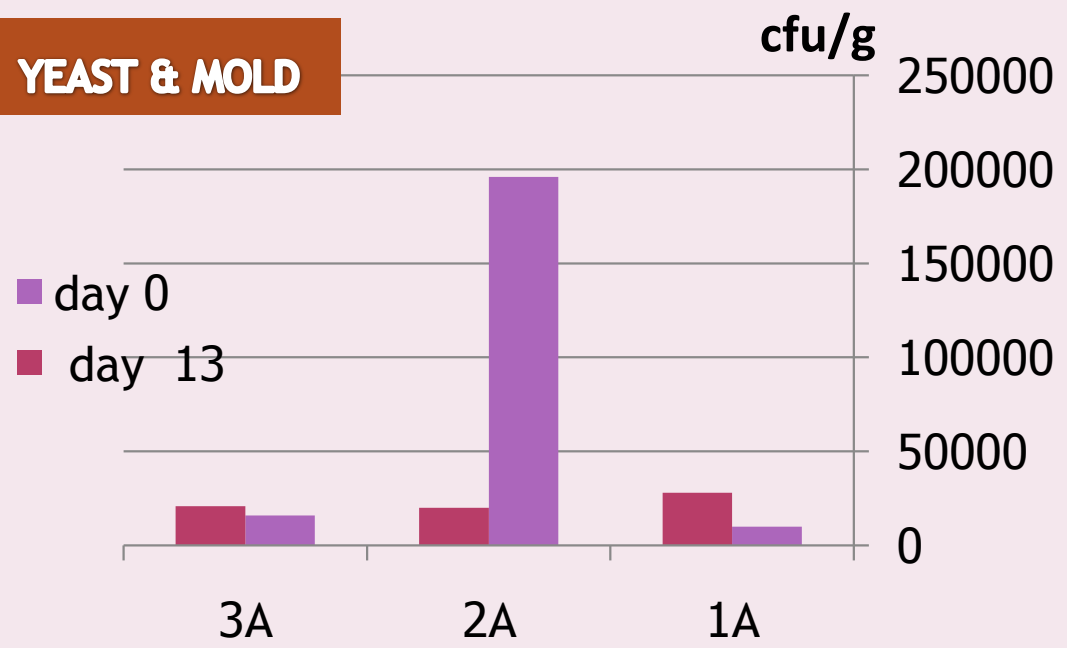




# TPC



# YEAST & MOLD



# CONCLUSION

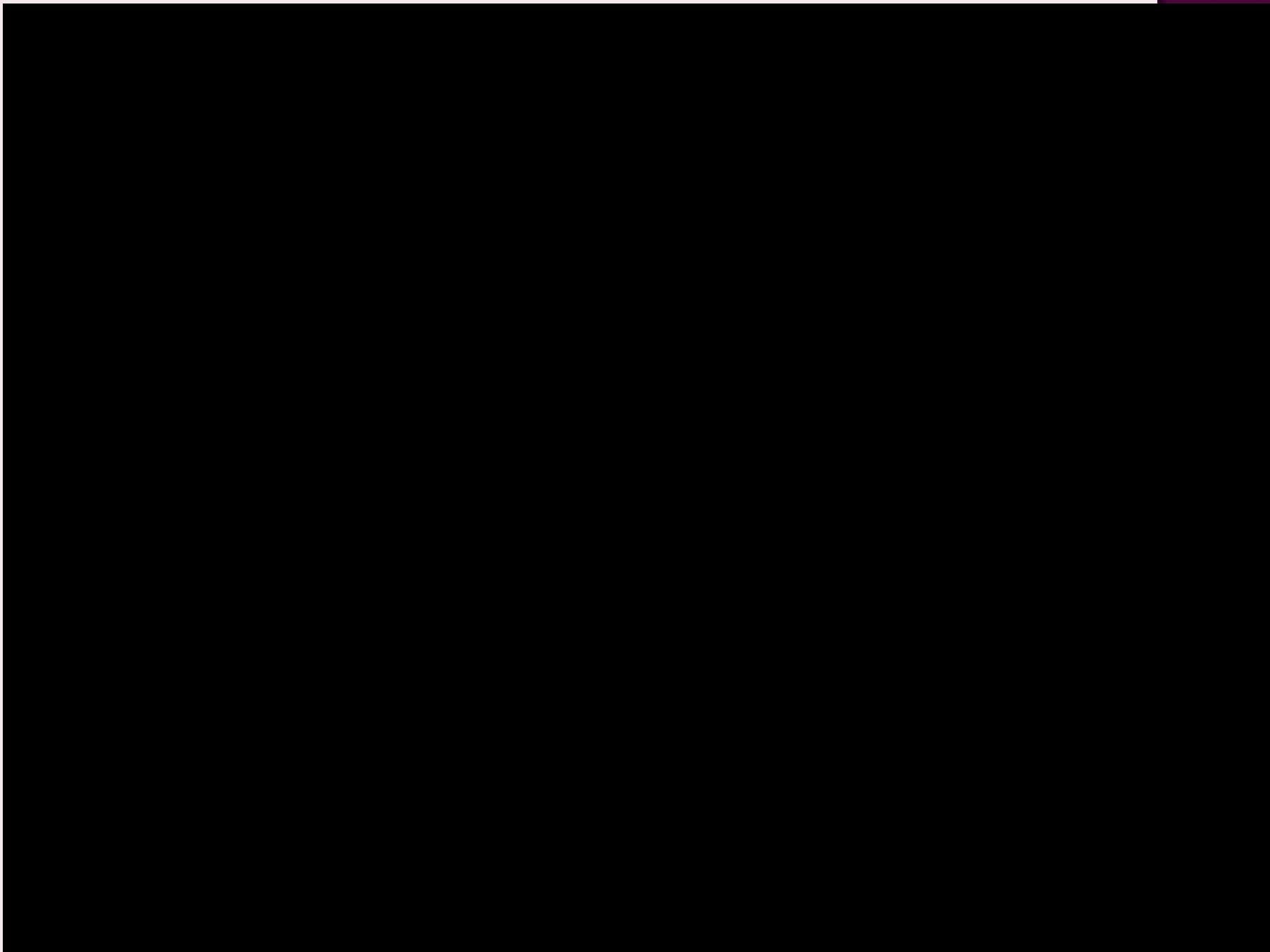
After conducting the first experiment and discussing its results it was shown that the best groups of all the sensory and microbiological aspects is A

After conducting the second experiment, we chose A2 as the best group , which we will complete on it .

As it gave the best results in terms of color .tests and microbial tests and it has been very admired and accepted by people

# FUTURE PERSPECTIVE

- ◉ FOCUS ON :-
- ◉ Safety
- ◉ Microbial tests to determine stability and shelf life of this product .
- ◉ Using of MAP packaging





THANK YOU FOR LISTENING!