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Formulation of low-sodium Nabulsi cheese by using potassium chloride

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Introduction :

Cheese is perceived as being a food source that is highly concentrated in sodium (1) .

Nabulsi cheese :
- preserved in a highly concentrated brine solution
- traditional cheeses in Palestine
- classified as semi-solid
- Fresh Cheese (2,3)

Milk sources :
sheep
goat milk
Cows' milk,
a mixture between cow and goat milk.(2,3)

Preservation methods of Cheese :

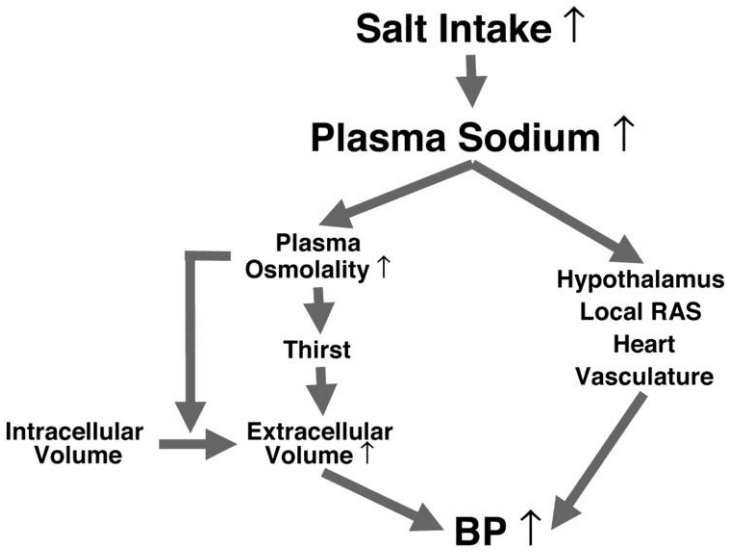
- Ripening
- Fermentation
- Brain solution as NaCl that use it Nabulsi Cheese (15%-20%)

- Manufacturers intentionally increase the salt content of the cheese to promote water loss and to Reducing microbial growth and preserve cheese during prolonged storage.(3)

The World Health Organization has proposed to reduce sodium intake by 30% in order to obtain the WHO guideline of 2 g/day (i.e., 5 g of salt/day) by 2020 .

High blood pressure (hypertension)

- factors increase the risk hypertension : high sodium intake , smoking, lack of physical activity, stress , age , race , being overweight, and there are genetic factors (5)



RAS : local renin-angiotensin system

BP : blood Pressure

High Sources of Sodium salt :

Objective :

- ❑ Study the characteristics of the cheese after the partial replacement of the sodium salt of the physical microbial growth , and the shelf life of the refrigerator temperature.

- ❑If the product with lower sodium content and consumer acceptance of it succeeds, then the benefits of reducing the risk of blood pressure by the Nabulsi cheese producer

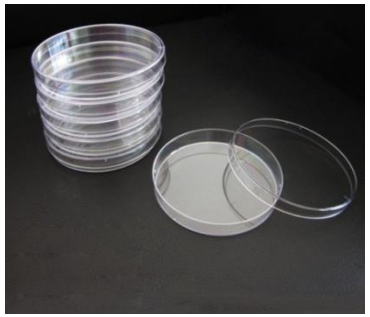
Material :

Electronic Balance

Agar for M.O

Texture Analyzer
load : 7 g / speed 2.00 mm/s

Colorimeter



Petri Dish

Fresh cheese

(NaCl) , KCl Salts

Material :

Questionnaire for sensory analysis :

parameters :

saltiness

bitterness

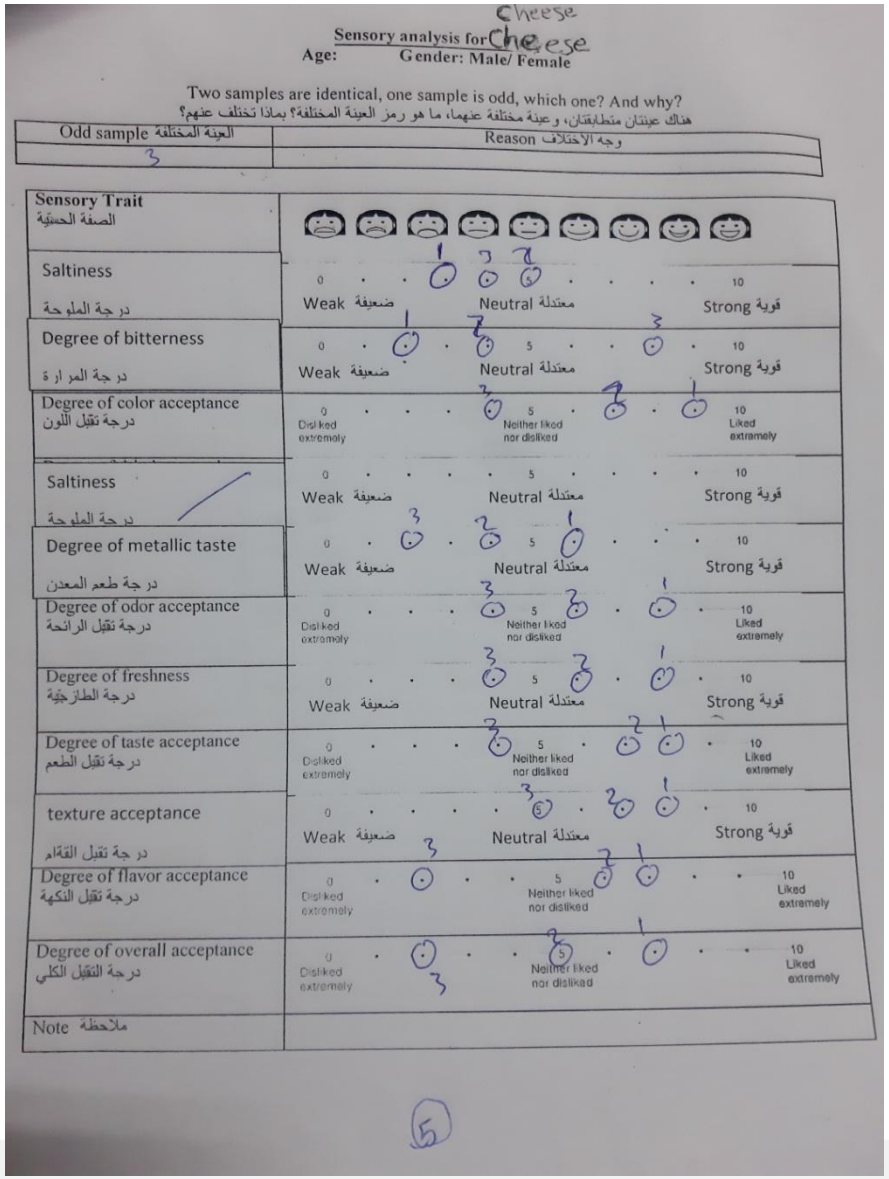
color acceptance

metallic

odor acceptance freshness

taste acceptance

texture acceptance



Cheese

Sensory analysis for Cheese

Age: Gender: Male/ Female

Two samples are identical, one sample is odd, which one? And why?

هناك عينتان متطابقتان، وعينة مختلفة عنهما، ما هو رمز العينة المختلفة؟ بماذا تختلف عنهم؟

Odd sample العينة المختلفة	Reason وجه الاختلاف
3	

Sensory Trait الصفة الحسية	
Saltiness درجة الملوحة	0 Weak ضعيفة · Neutral معتدلة · 10 Strong قوية
Degree of bitterness درجة المرارة	0 Weak ضعيفة · 5 Neutral معتدلة · 10 Strong قوية
Degree of color acceptance درجة تقبل اللون	0 Disliked extremely · 5 Neither liked nor disliked · 10 Liked extremely
Saltiness درجة الملوحة	0 Weak ضعيفة · Neutral معتدلة · 10 Strong قوية
Degree of metallic taste درجة طعم المعدن	0 Weak ضعيفة · 5 Neutral معتدلة · 10 Strong قوية
Degree of odor acceptance درجة تقبل الرائحة	0 Disliked extremely · 5 Neither liked nor disliked · 10 Liked extremely
Degree of freshness درجة الطازجية	0 Weak ضعيفة · 5 Neutral معتدلة · 10 Strong قوية
Degree of taste acceptance درجة تقبل الطعم	0 Disliked extremely · 5 Neither liked nor disliked · 10 Liked extremely
texture acceptance درجة تقبل القوام	0 Weak ضعيفة · Neutral معتدلة · 10 Strong قوية
Degree of flavor acceptance درجة تقبل النكهة	0 Disliked extremely · 5 Neither liked nor disliked · 10 Liked extremely
Degree of overall acceptance درجة التقبل الكلي	0 Disliked extremely · 5 Neither liked nor disliked · 10 Liked extremely
Note ملاحظة	

5

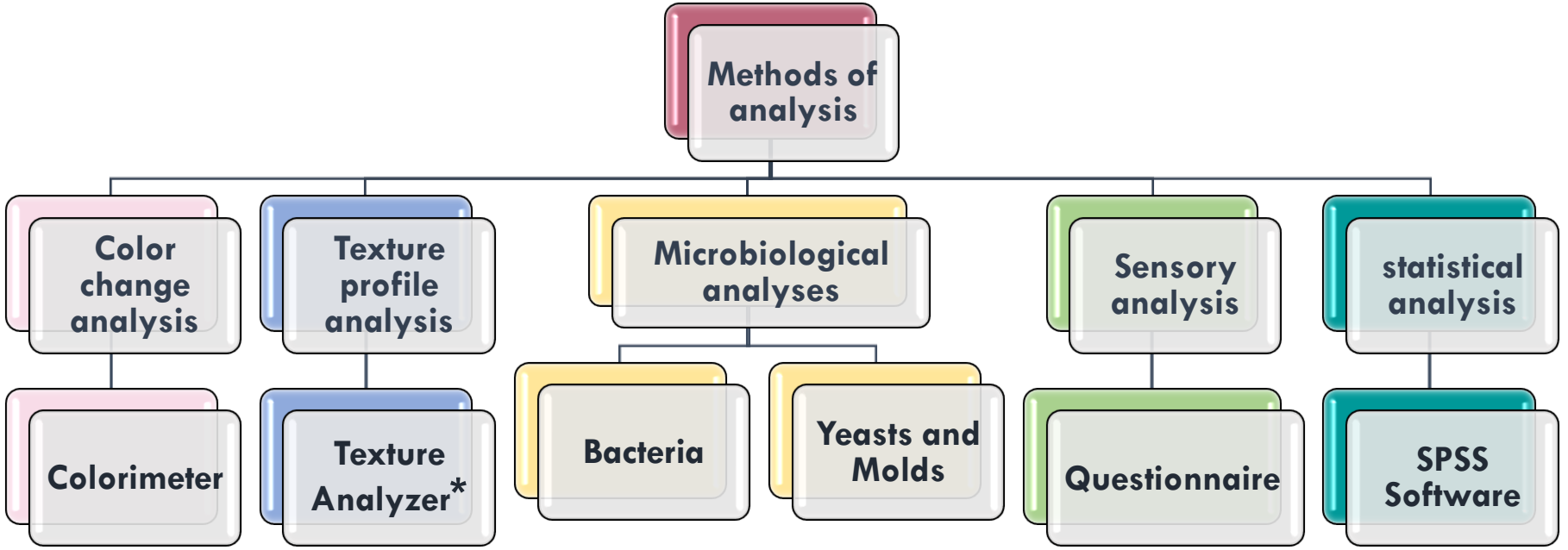
Method :

Cheese preservation

- Salt concentration 4%

Treatments	Salt concentration
A (Control)	100% Nacl
B	80% NaCl , 20 %KCl
C	60% NaCl , 40% KCl

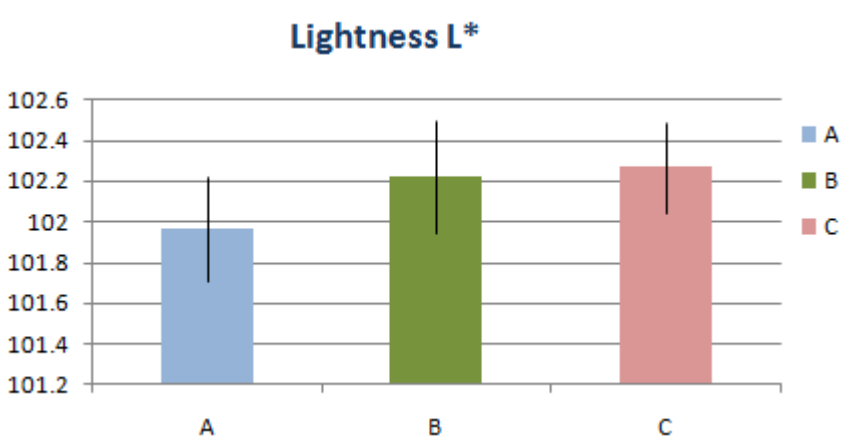
Methods :

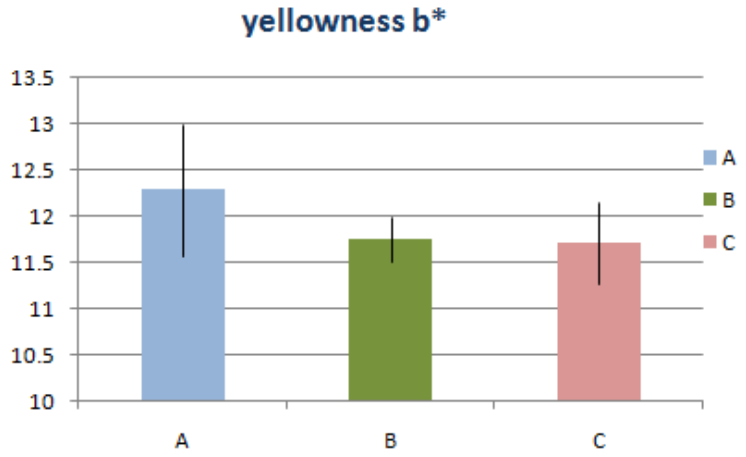


*Parameters such as Hardness, Stringiness Length , Cohesiveness, Springiness , Gumminess: Chewiness

Result :

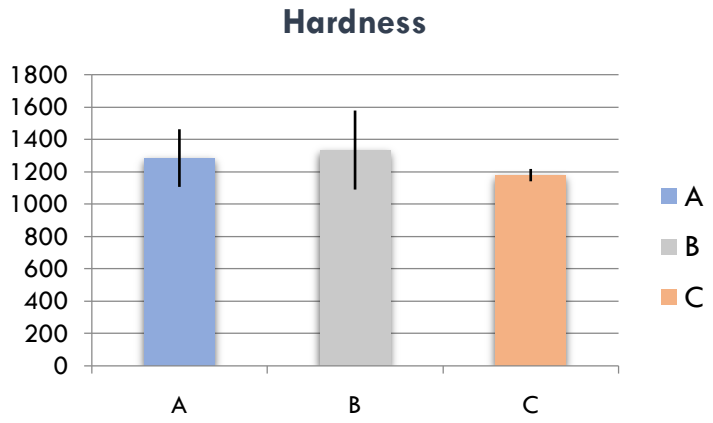
1. Color Changes

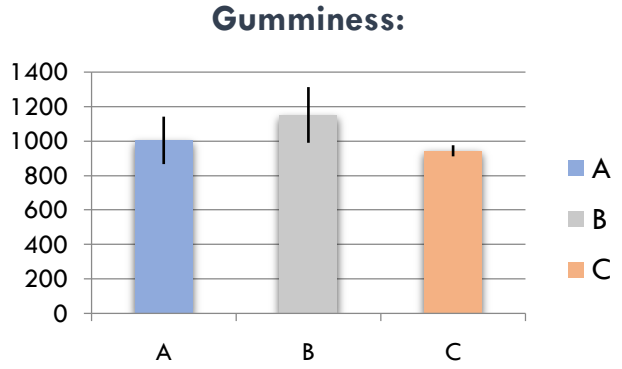


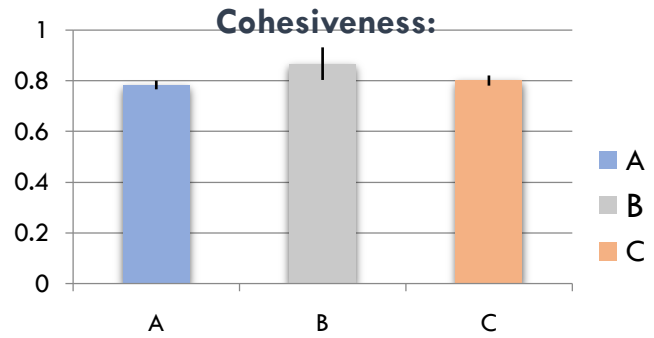


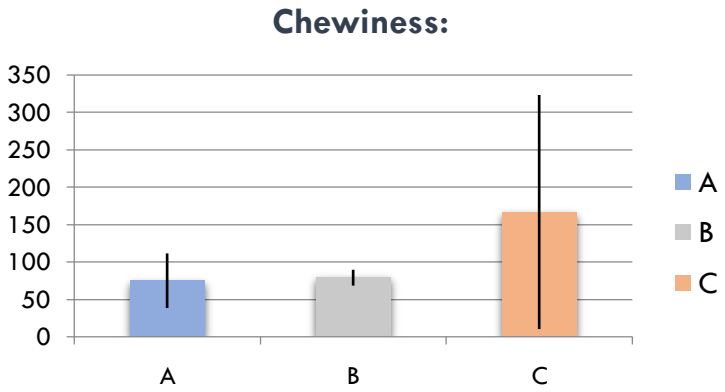
Result :

2. TPA result









Result :

3. Microbial growth

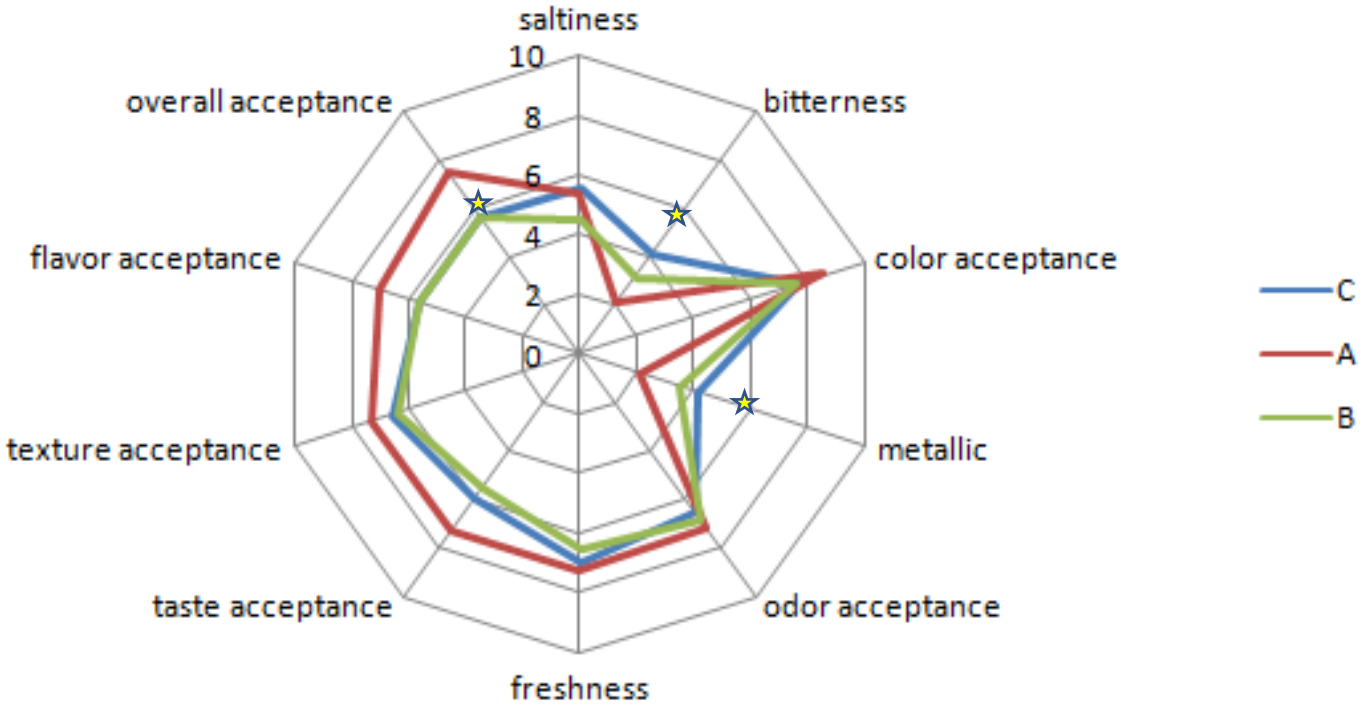
The third dilution for microbial test bacteria , yeasts , molds

Microorganisms	Sample	0 days	12 days
TPC	A	5.1×10^{-4}	TNTC
	B	1.60×10^{-5}	2.8×10^{-5} ★
	C	1.40×10^{-5}	2.0×10^{-5} ★
Yeast/Molds	A	1.3×10^{-4}	TNTC
	B	7.0×10^{-4}	TNTC
	C	5.0×10^{-4}	TNTC

TNTC : Too Numerous To Count

Result :

4 . Sensory analysis



Conclusions :

-No significant different in control sample 100% NaCl and use 20% concentrate of potassium salt .

-There were positive results for the use of KCl salt in growth microbial, where the growth was less , and the color was a clear indication of freshness .

- consumer acceptance was not specified for samples containing KCl salt , However, the sensory receptivity of the control sample was higher and samples containing KCL salt concentrations were not specified whether it would be accepted or not .

Recommendation :

The consumer should aim to reduce the food that is highly concentrated in the sodium salt due to its harmful effects .

It is for factories to adopt the idea of substitution to reduce the sodium content .

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