Co-funded by the European Union

Universidad de Extremadura

FERMENTATION CHALLENGE

BREAD GROUP


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Bekzod
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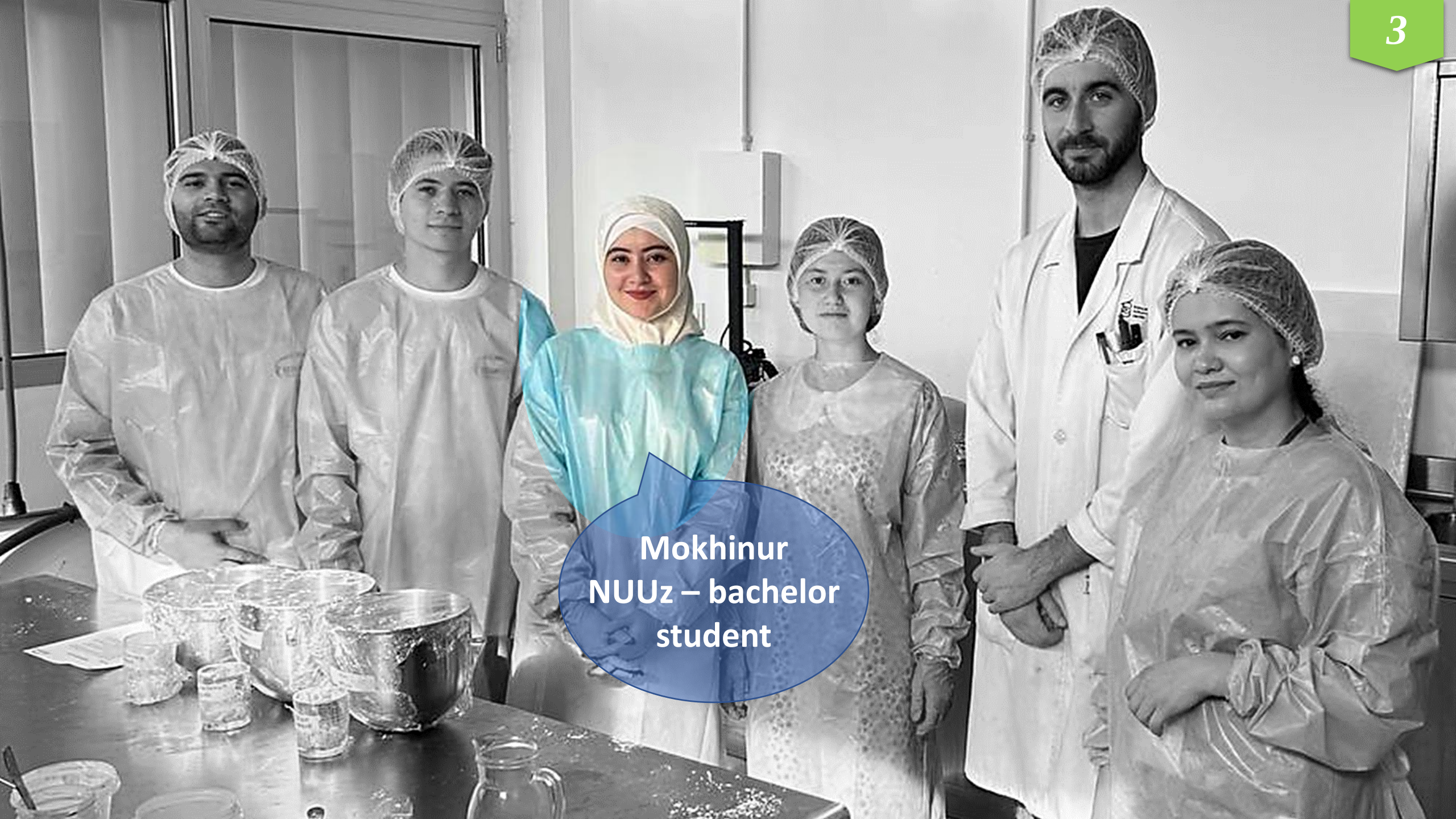
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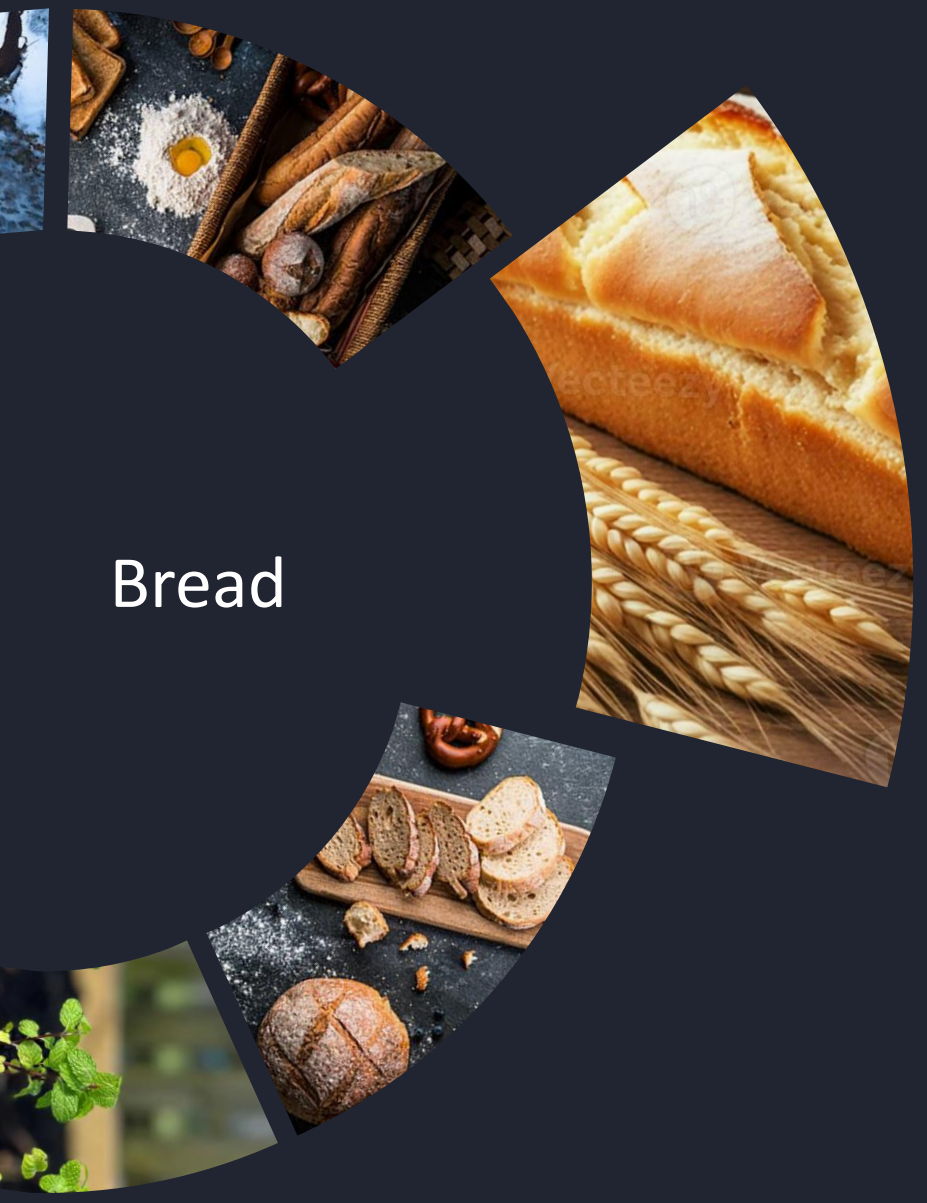
ASU – bachelor student


Maftuna
UrSU – Ph.D
student


JOSE - team coach


BREAD

Bread. Description. Origin



Bread is a versatile and essential food product made from flour, water, yeast, and salt. It comes in a variety of forms, including loaves, rolls, baguettes, and flatbreads, each with unique textures, flavors, and uses.

Origin

The earliest known records of yeast risen bread come from Ancient Egypt in 1300–1500 BCE (Samuel, 1996; Sicard and Legras, 2011) and China in 500–300 BC (Shevchenko et al., 2014).

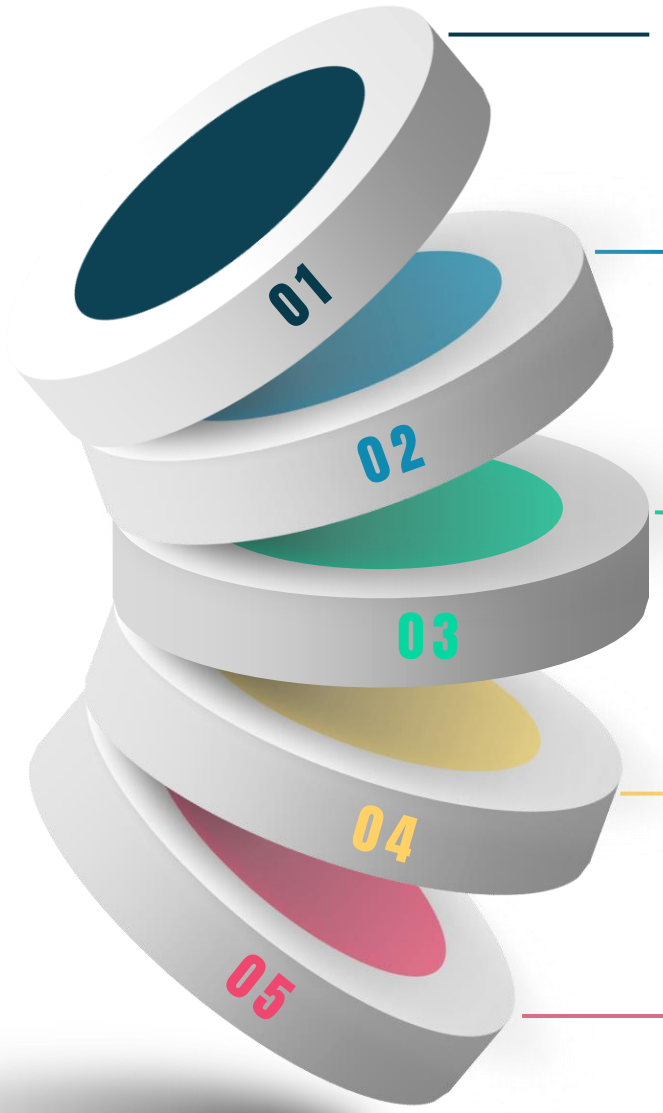
Commercial bread

The first “commercial” production of yeast, that is the growing of yeast for the sole purpose of selling it to others, arose in the 1700s.

Bread

Early recipes for commercial bread could contain as little as 4–6% yeast, which would consist of multiple strains as well as any associated bacteria (Frey, 1930).

Safety and health implications



Good hygiene practices should be followed. Including regular sanitation of equipment and facilities.

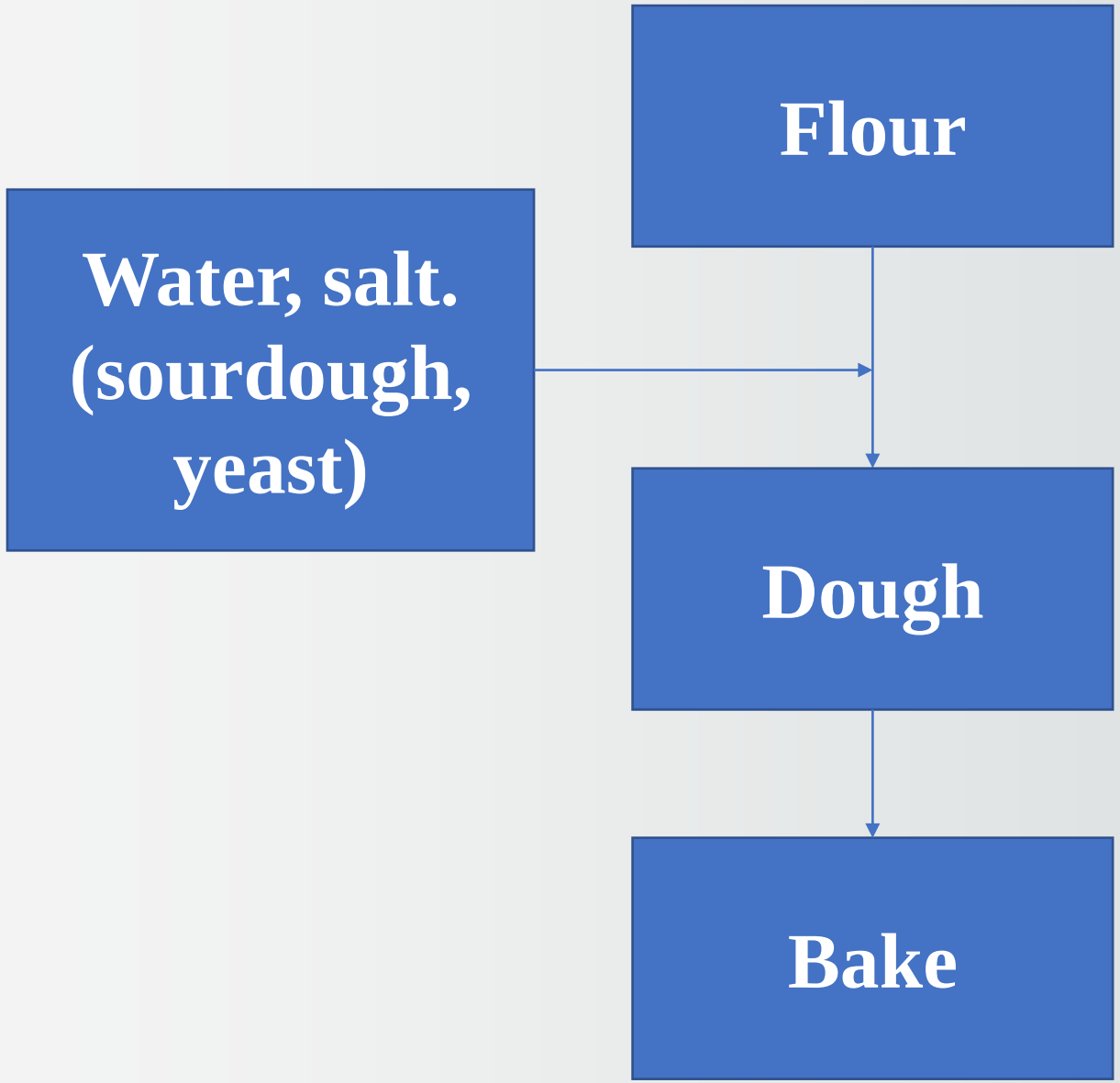
End product is only as good as the quality of the product going into it. Ingredients should be safe

Bread is a good source of essential nutrients, including carbohydrates for energy, fiber for digestive health, and various vitamins and minerals.

whole grain breads provide additional health benefits, such as reducing the risk of heart disease, aiding in weight management, and supporting overall gut health.

Fortification: Some of our bread varieties are fortified with additional nutrients like iron, folic acid, and B vitamins to support your dietary needs.

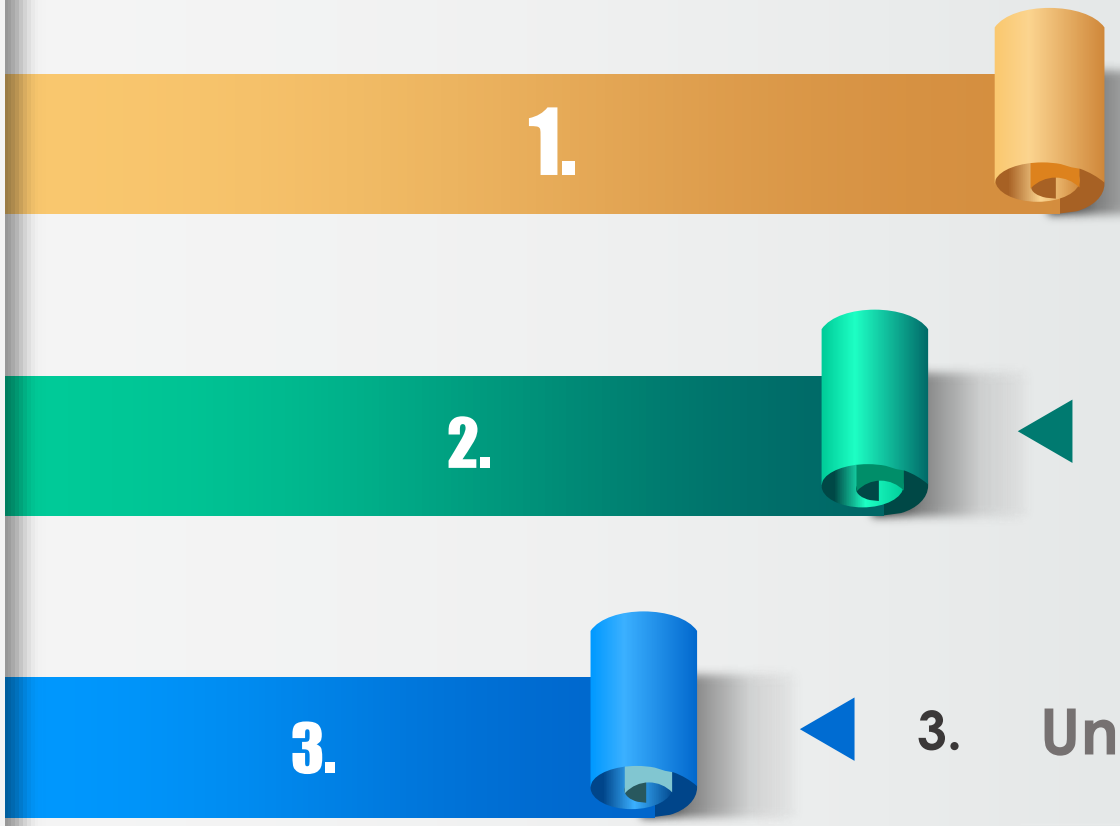
Process of baking bread



Mixing, knead.

Making folds. Wait 15minutes.
Fermentation 25–30 °C, 1 h
Bake 200°C, 45 min

Experimental design



1. Yeast Bread
2. Sourdough Bread
3. Unleavened Bread

1. Yeast

0.5 kg flour

400 mL water

30g salt

25g yeast

2. Sourdough

0.5kg flour

290 mL water

30g salt

166g sourdough

3. Unleavened

0.5kg flour

400 mL water

30g salt

Parameters that were controlled and monitored.

01 Color

02 pH level

03 CO_2 level

04 Texture level

Color meter

CM-700d Chroma Meter

Result

A and B

L

Color Meter is a versatile colorimeter designed to provide precise measurement of colors of various types of products and surfaces across different applications,

It measures 3 values.

L – light intensity

a – redness (from green to red)

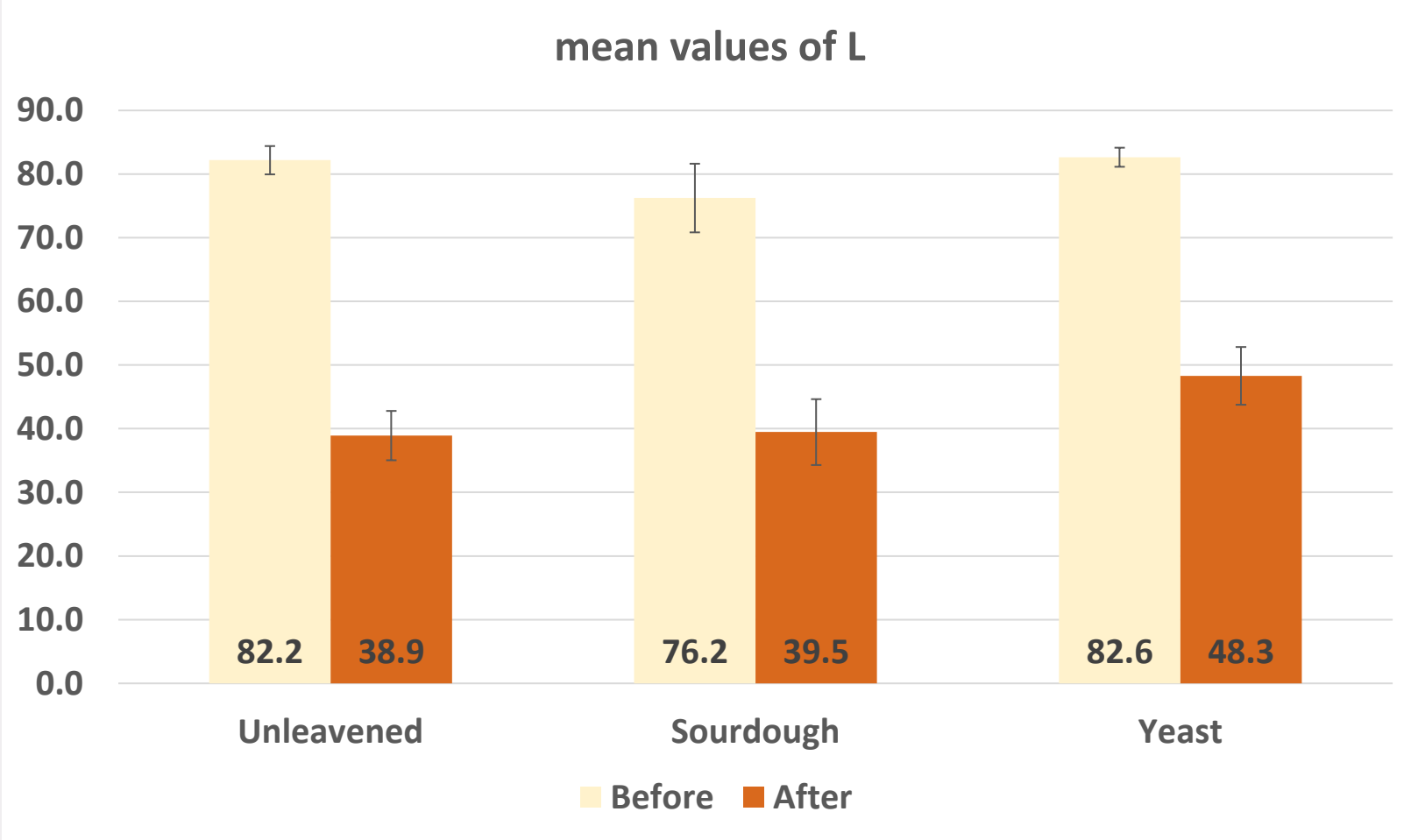
b – yellowness (blue to yellow)

Color meter

Result

A and B

Mean values of L (Before and after)



L

Color meter

Mean values of a (Before and after)

Mean values of b (Before and after)

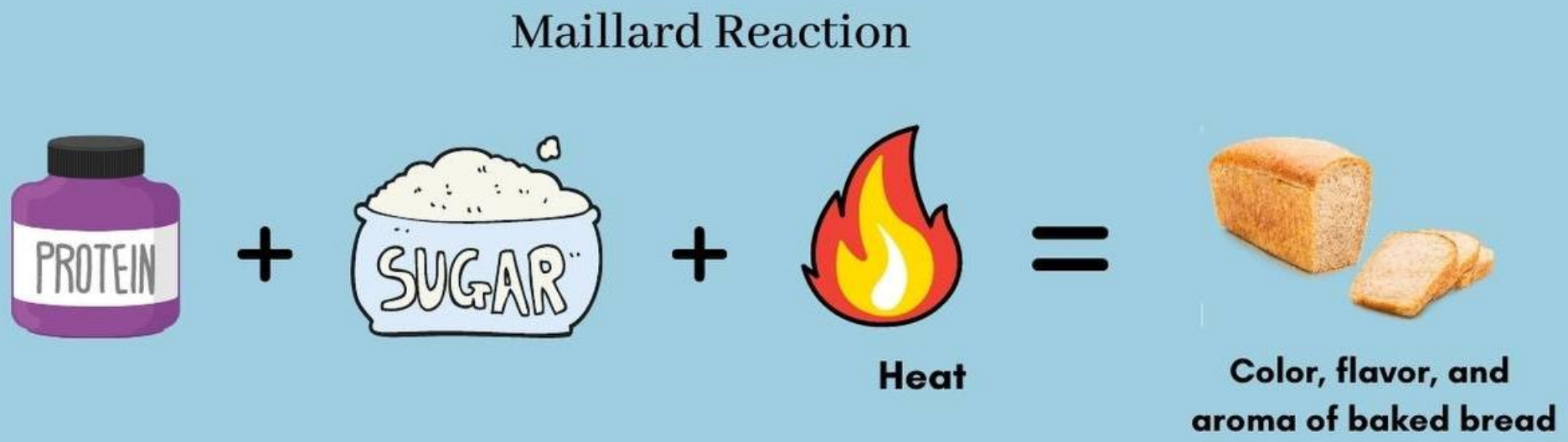
Before and After

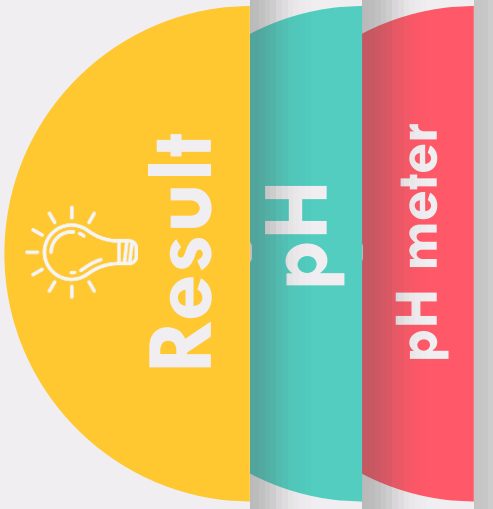
Yeast

Sourdough

Unleavened

Maillard reaction





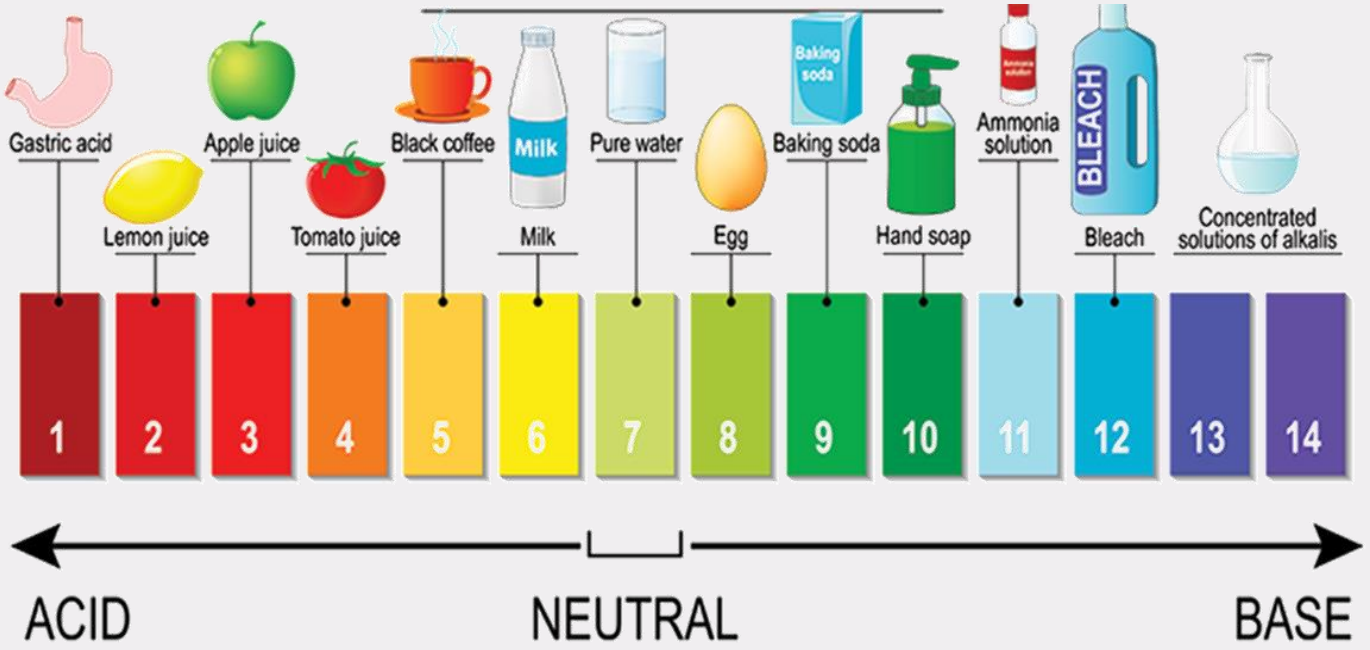
pH meter

Result

pH

pH meter

pH meter is an instrument measures acidity of a solution.

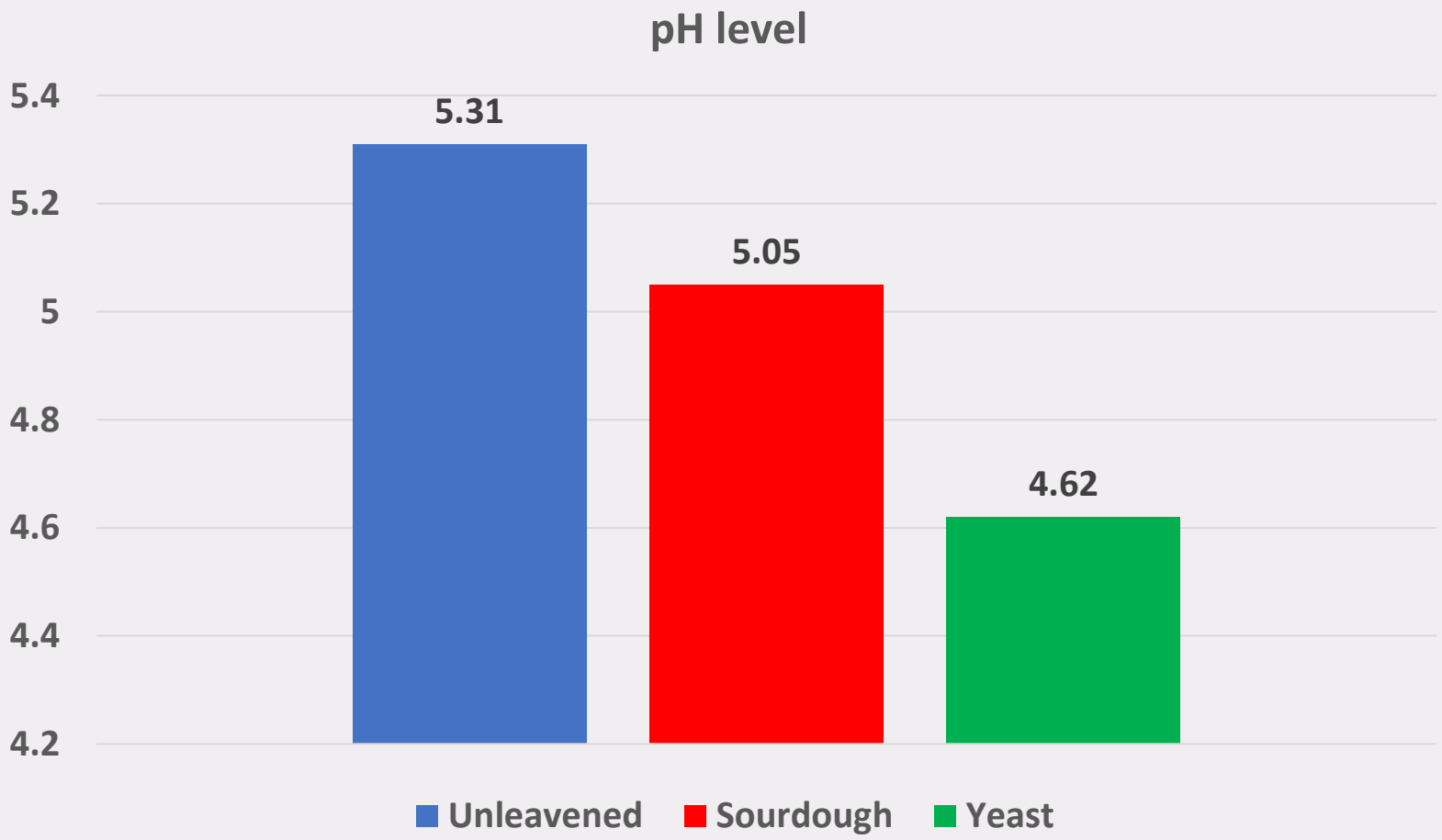


Result

pH

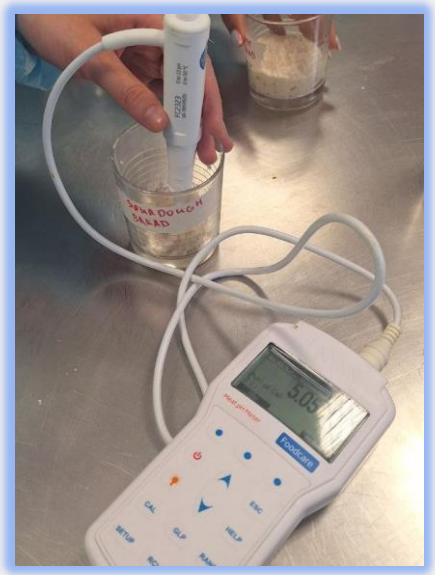
pH meter

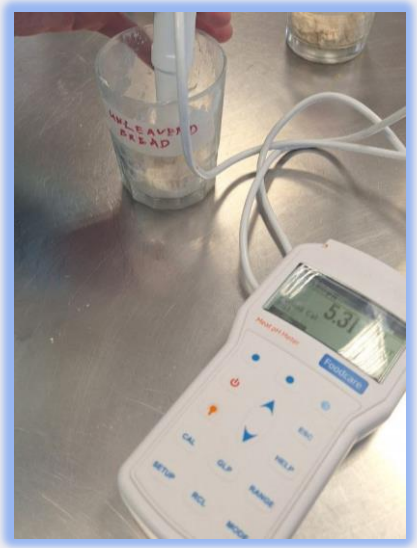
pH level of doughs (48 hours)



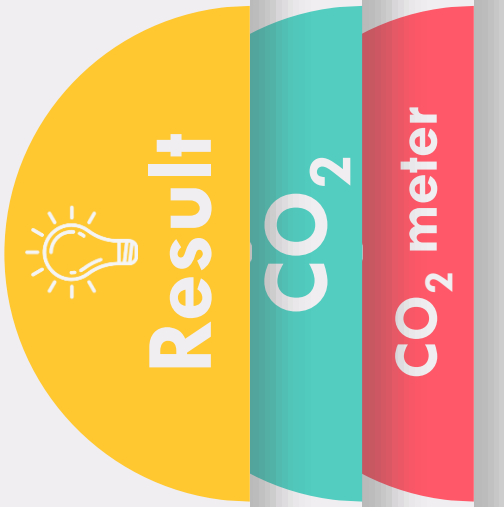
Results


HANNA
4.62 pH
Meat pH Meter
Foodcare
ESC
HELP






YEAST BREAD
SOURDOUGH BREAD
UNLEAVENED BREAD



CO_2

PBI Dansensor – gas detector

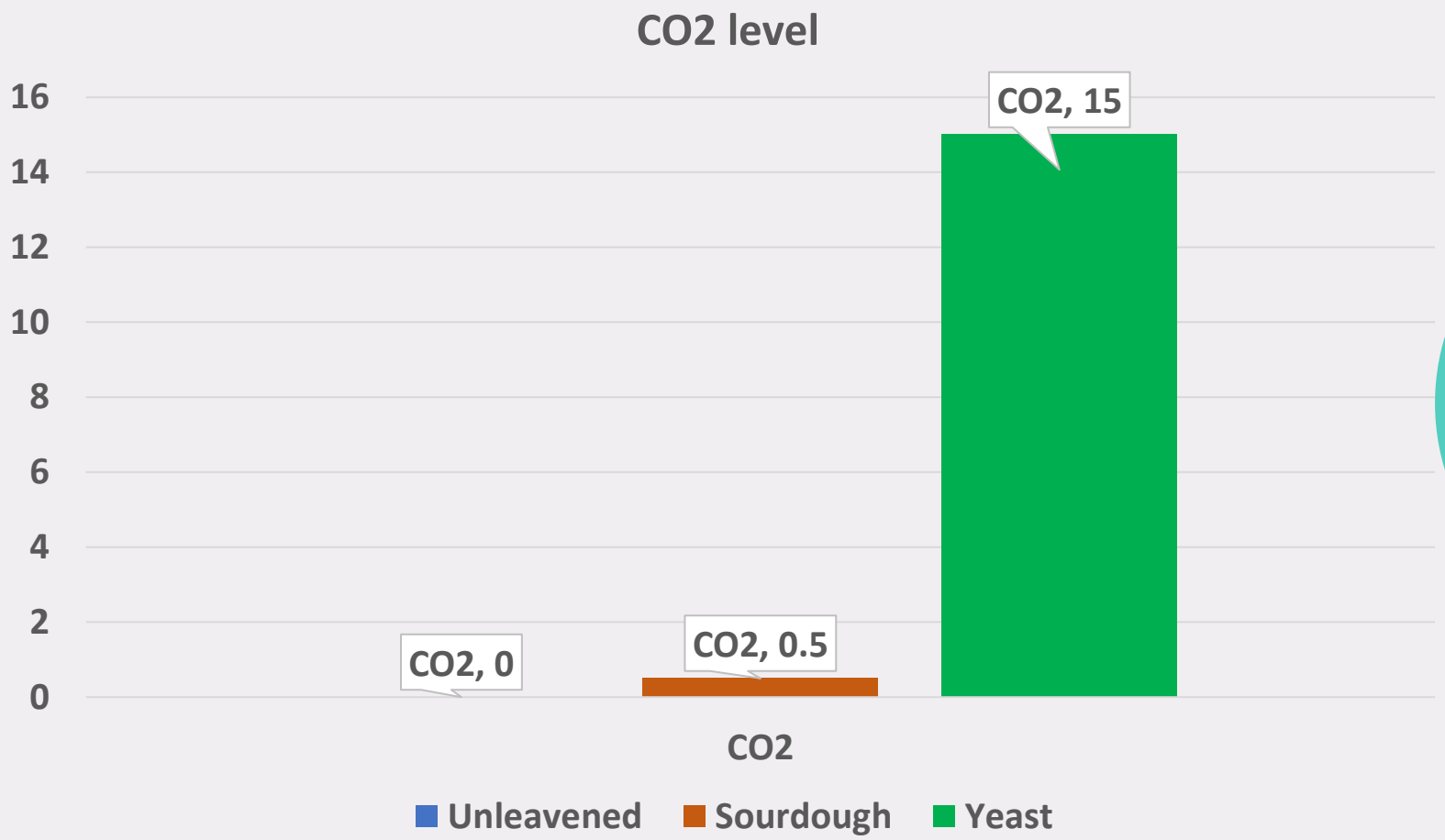
Result CO_2

PBI Dansensor – gas detector

It is able to measure both oxygen and carbon dioxide and it can check your gas for oxygen impurities.

CO_2 meter

CO_2 level of doughs (48 hours)

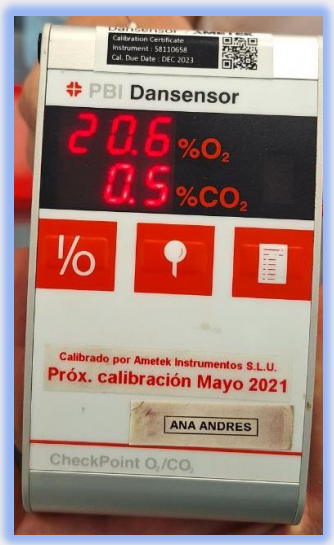


Result

CO_2

CO_2 meter

Results



Result

CO_2

CO_2 meter

Texture meter

Te.Xt plus

Texture analyser

Chewiness

Gumminess

Cohesiveness

Springiness

Hardness

Texture

Texture Analyser is a texture measurement system that moves in either an up or down direction to compress or stretch a sample.

Chewiness

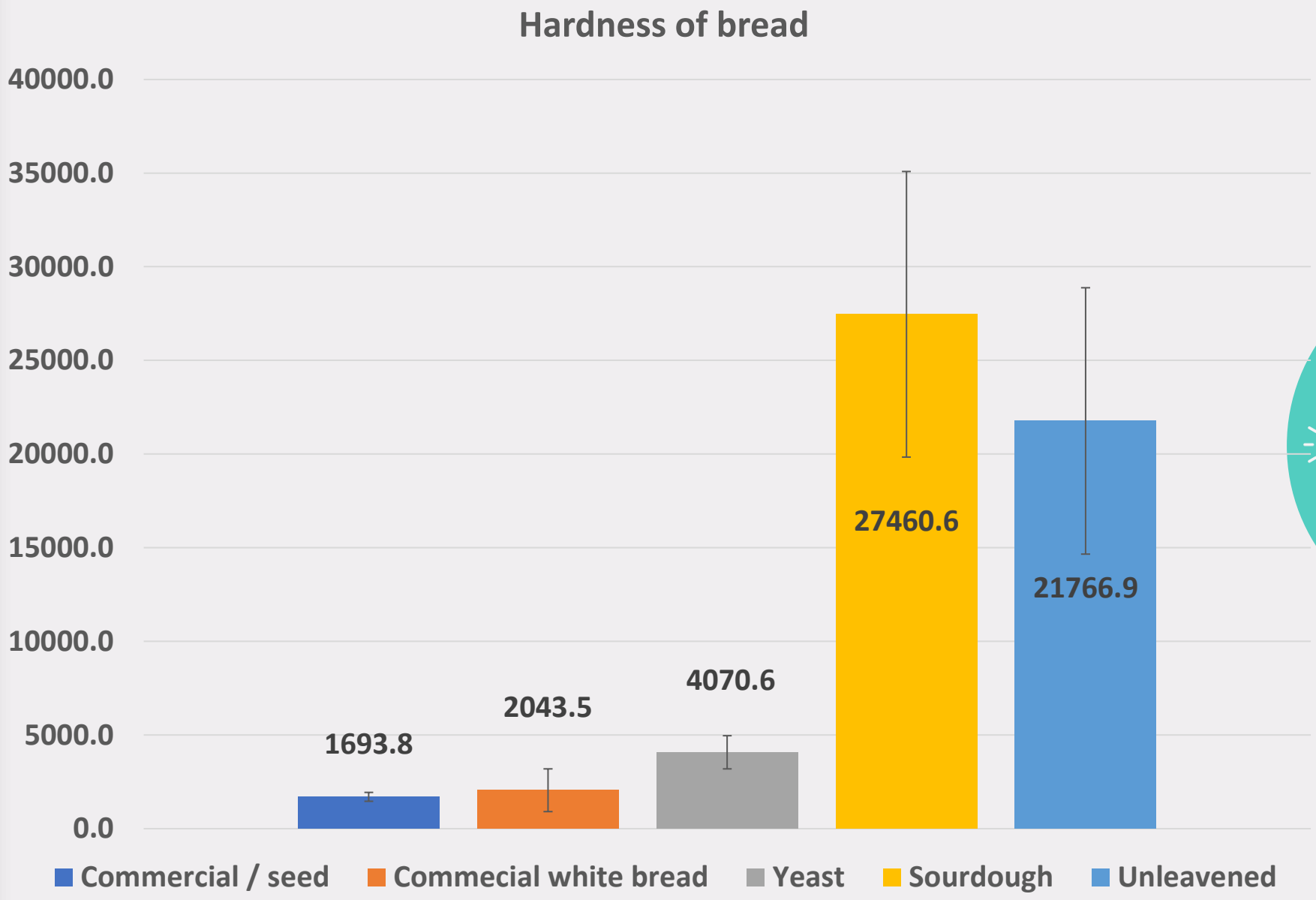
Gumminess

Cohesiveness

Springiness

Hardness

Texture



Chewiness

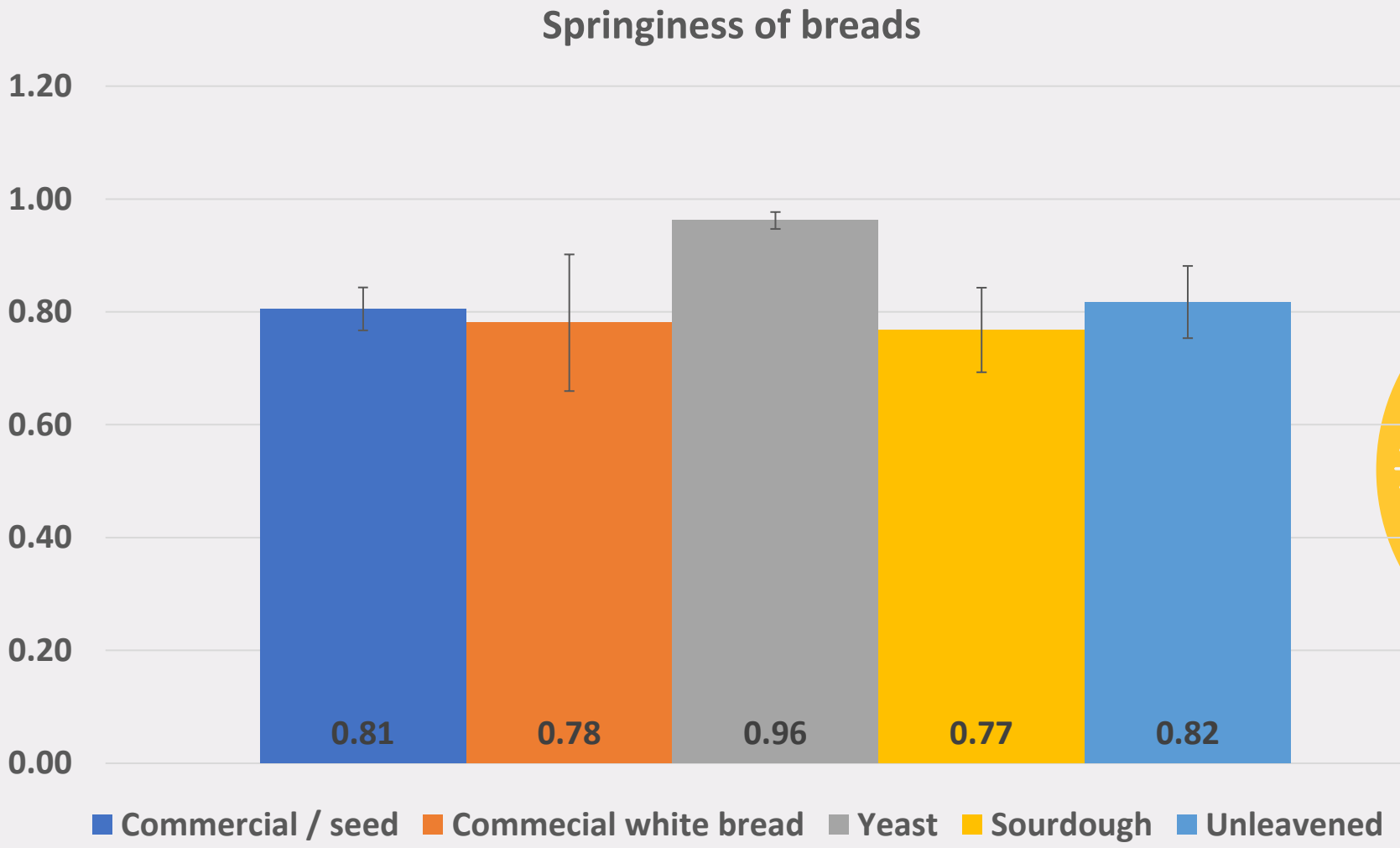
Gumminess

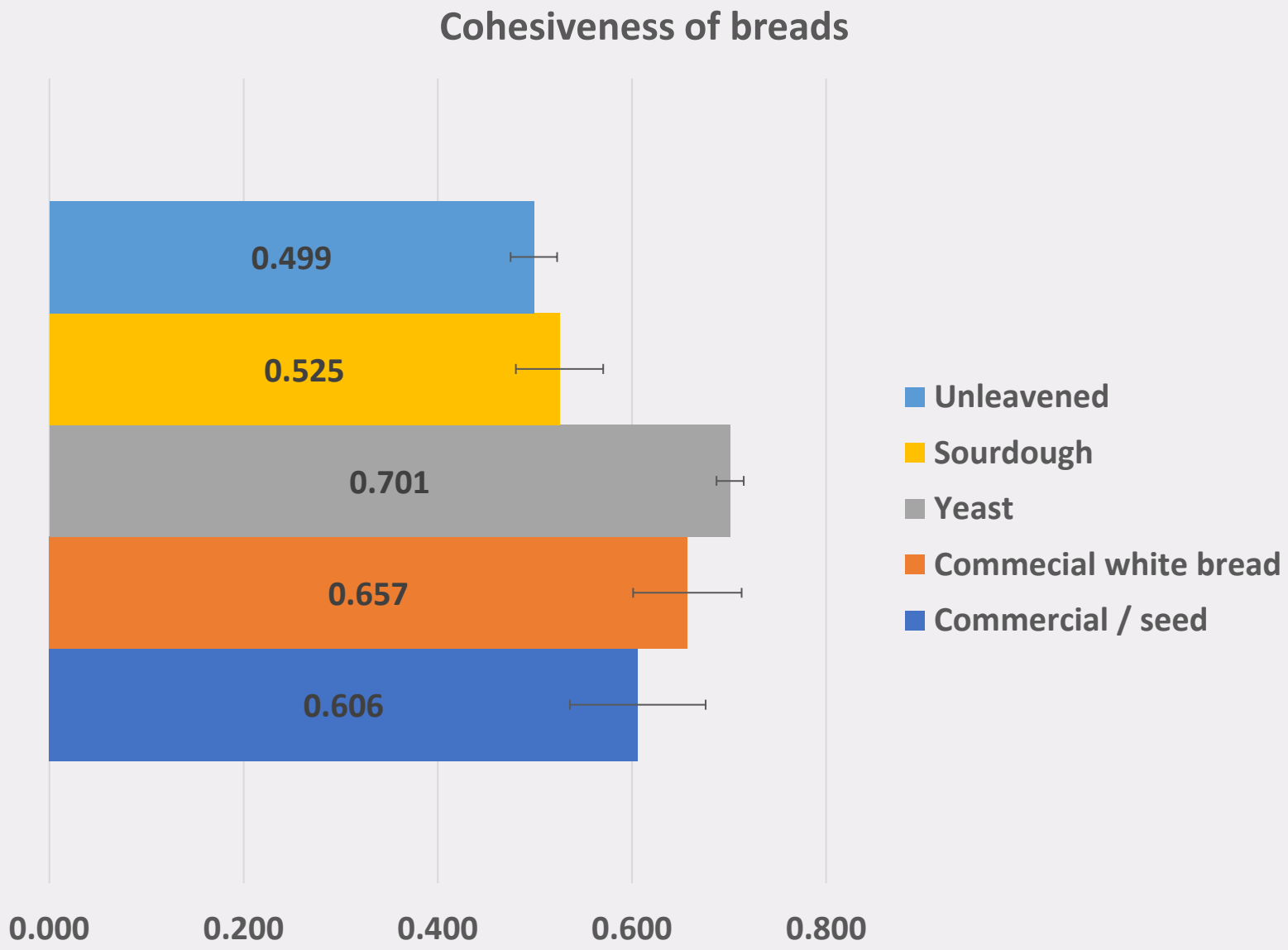
Cohesiveness

Springiness

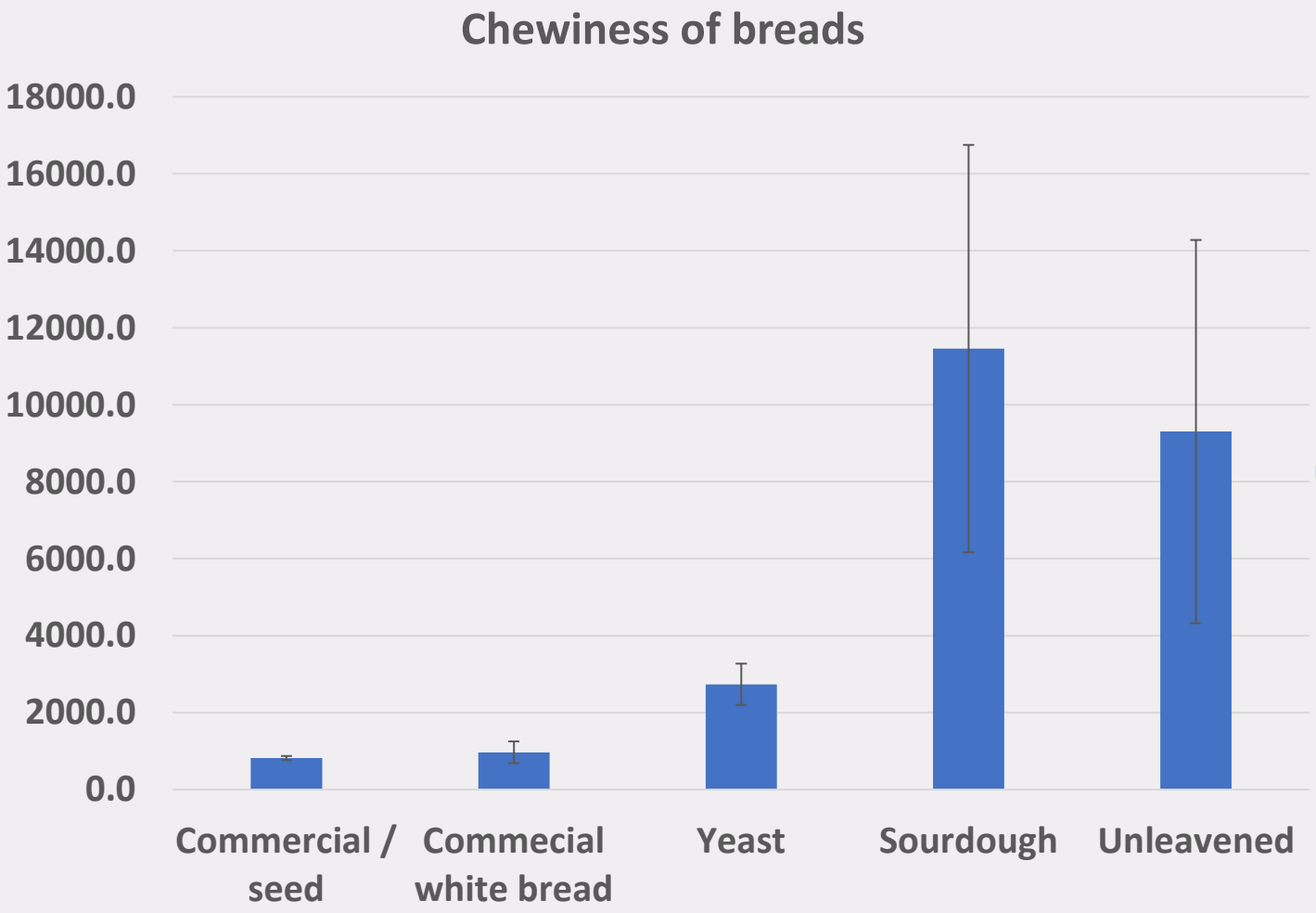
Hardness

Texture




Cohesiveness of breads
0.499
0.525
0.701
0.657
0.606
0.000
0.200
0.400
0.600
0.800
Unleavened
Sourdough
Yeast
Commecial white bread
Commercial / seed


Gumminess of breads
25000.0
20000.0
15000.0
10000.0
5000.0
0.0
1022.6
1303.3
2846.8
14588.4
11203.5
Commercial / seed
Commecial white bread
Yeast
Sourdough
Unleavened



Resilience

Chewiness

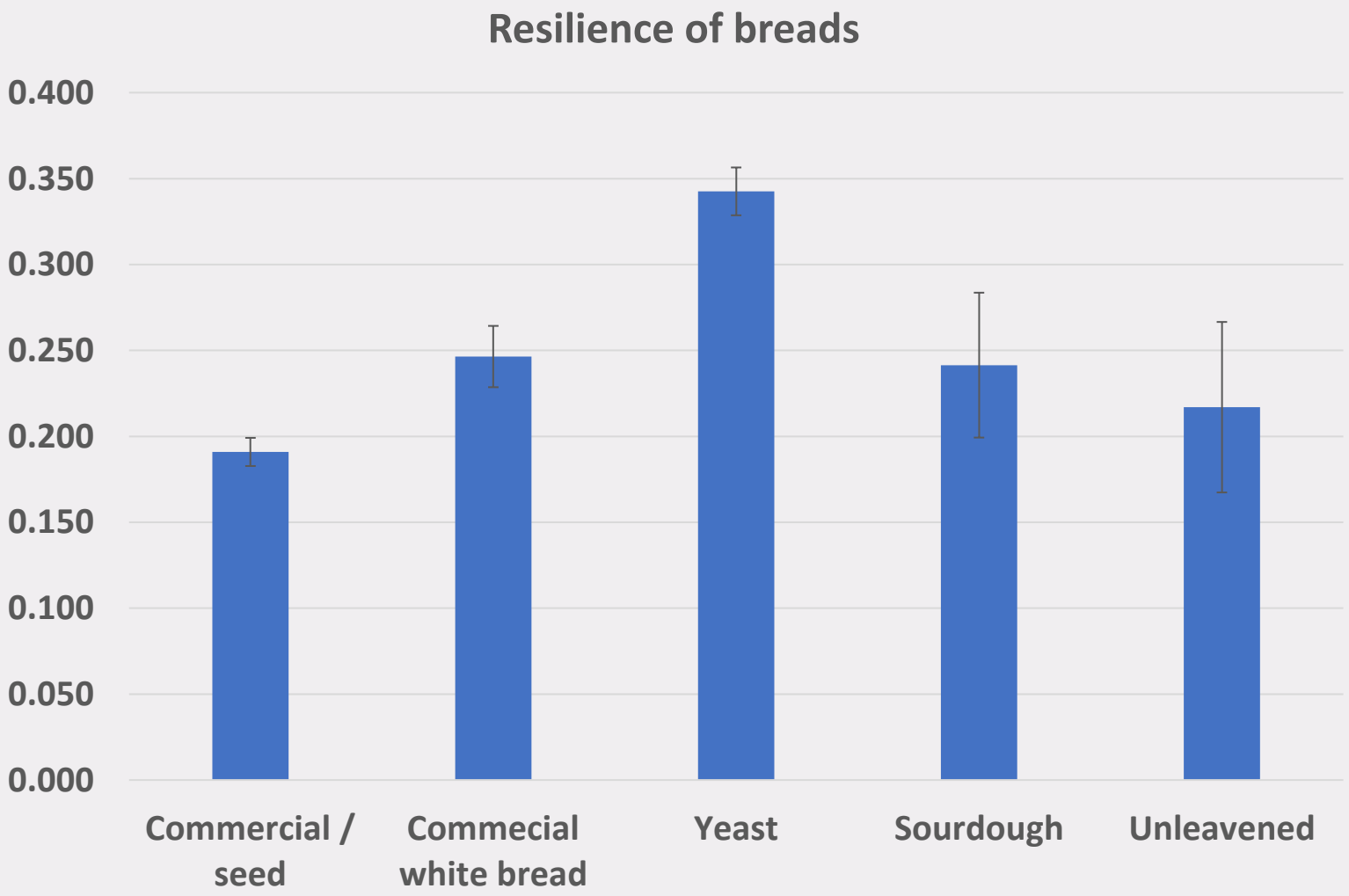
Gumminess

Cohesiveness

Springiness

Hardness

Texture



Resilience
Chewiness
Gumminess
Cohesiveness
Springiness
Hardness

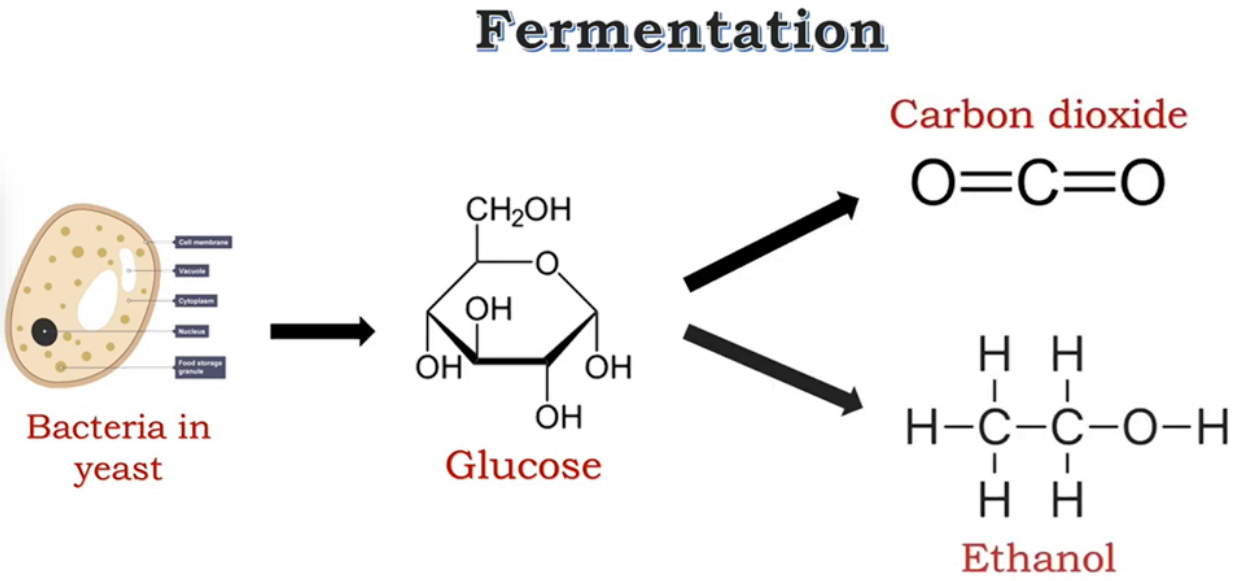
D

C

B

A

Conclusions



Gracias! Thank you! Mange tak! Rahmat!