

Invent Yourself: Baking bread

Team Romania

Problem

13. Invent Yourself: Baking bread

Distinctly different types of bread are produced by varying methods of baking, proportions of ingredients, and types of flour. Suggest an experimental and theoretical study of how one or several bread varieties are baked.

How does the rising agent affects the final product? What are the differences between bread with sourdough and bread with yeast?

Content

1. Bread: general facts
2. Basic ingredients: flour, water, sugar, salt, yeast
3. Yeast
4. Sourdough
5. Experiment 1: how to make sourdough starter
6. Experiment 2: comparison between sourdough and yeast
7. The chemistry behind baking bread
8. The process of bread-making
9. Experiment 3: baking bread with yeast
10. Experiment 4: baking bread with sourdough. Physical properties comparison.
11. Taste analyze
12. Expiration data
13. Economical comparison
14. Conclusions
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1. Bread

Soft, warm, chewy, doughy, bread is one of the oldest man-made foods and it's an important food in large parts of the world.



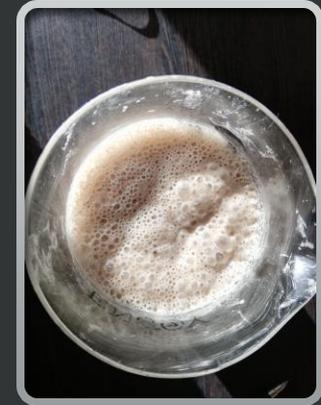
2. Basic ingredients

- Flour-provides the structure for the product
- Water-form the gluten bonds
- Sugar-provides “food” for yeast
- Salt-regulates the rate of yeast activity
- Rising agents

3. Yeast

- single-celled fungi
- most commonly used for bread is *saccharomyces cerevisiae*

4. Sourdough

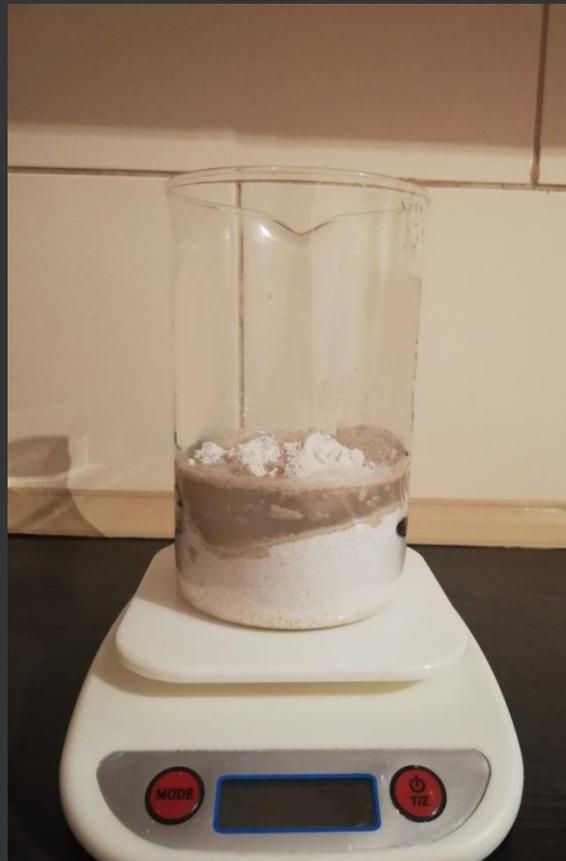


5. Experiment 1: how to make sourdough starter

The only ingredients that you need are water and multiple types of flour.

STEPS:

1. Mix 100g of whole grain flour and 150mL of water
2. Cover it up
3. Let it rest for a day at the room temperature



In the second day I removed half of the sourdough and added 50 more grams of whole grain flour, 50g of rye flour and 100mL of water. I repeated this procedure for 5 days.



Experiment 1

I did 2 different preferments with the sourdough with 2 different recipes.



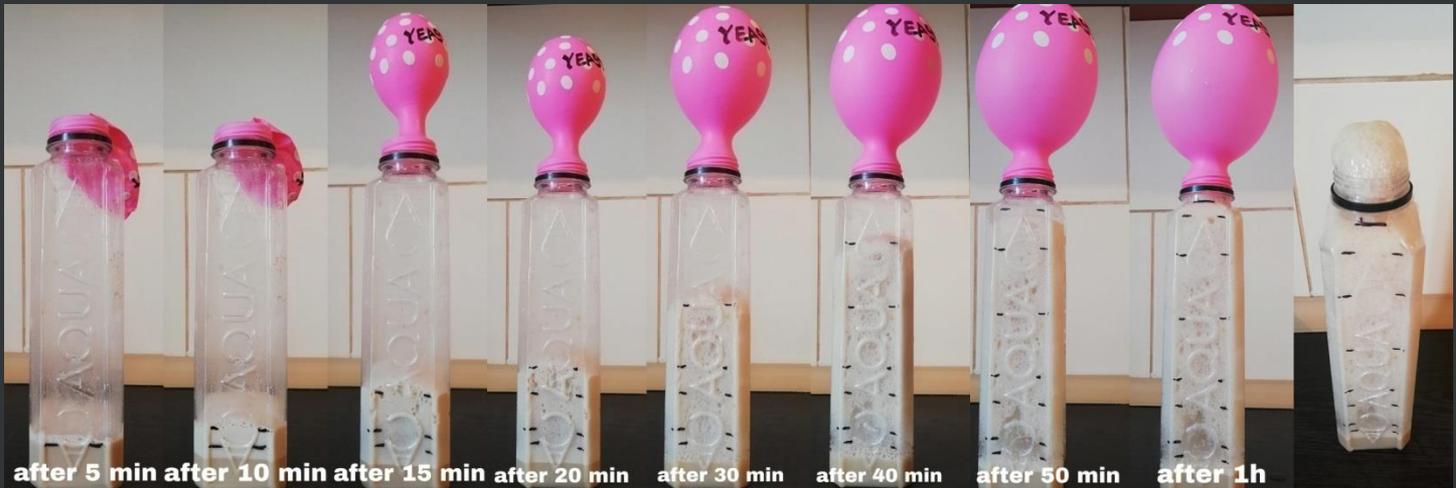
Comparison between the activity of sourdough
in the day 3 and 4

6. Experiment 2

For the second experiment our team proposes a comparison between the volume of carbon dioxide emitted by yeast and by sourdough. For this experiment you will need:

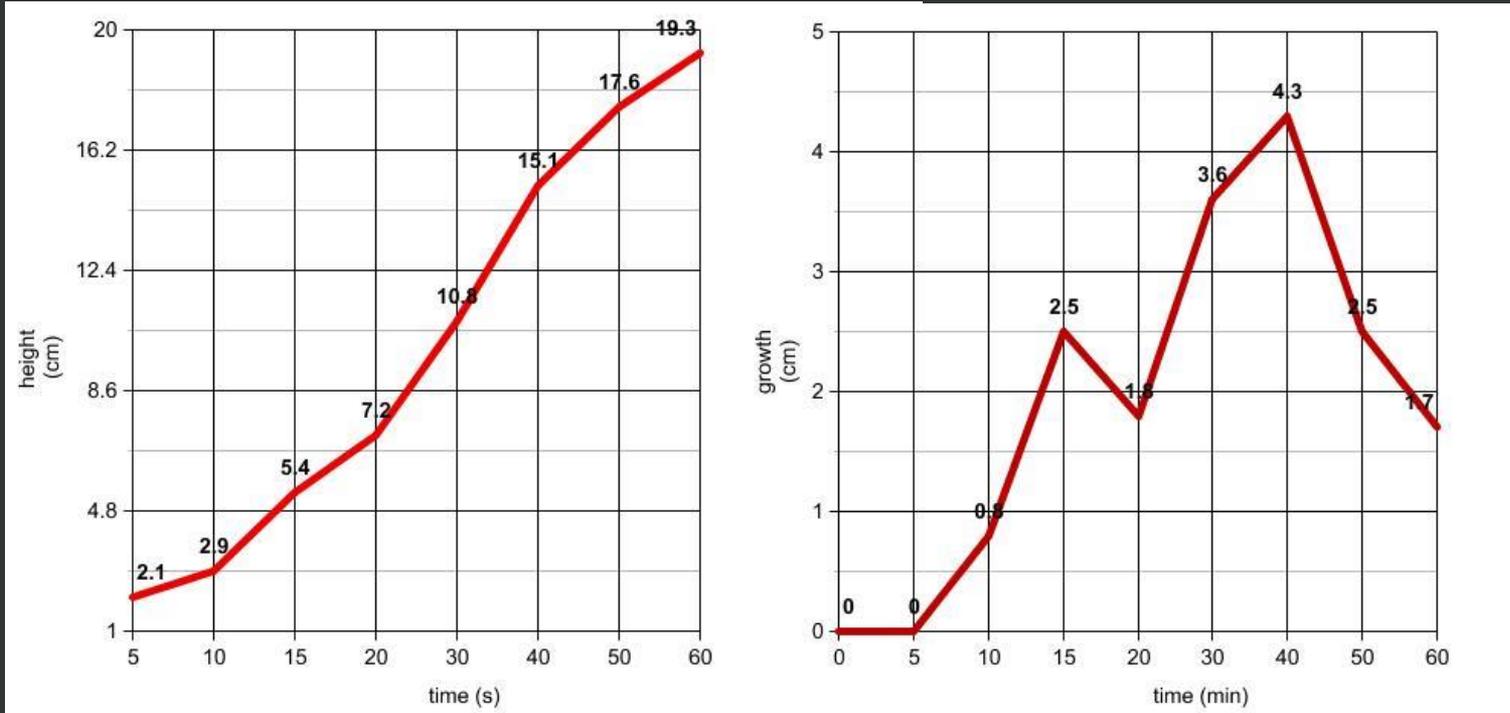


Description of the yeast experiment

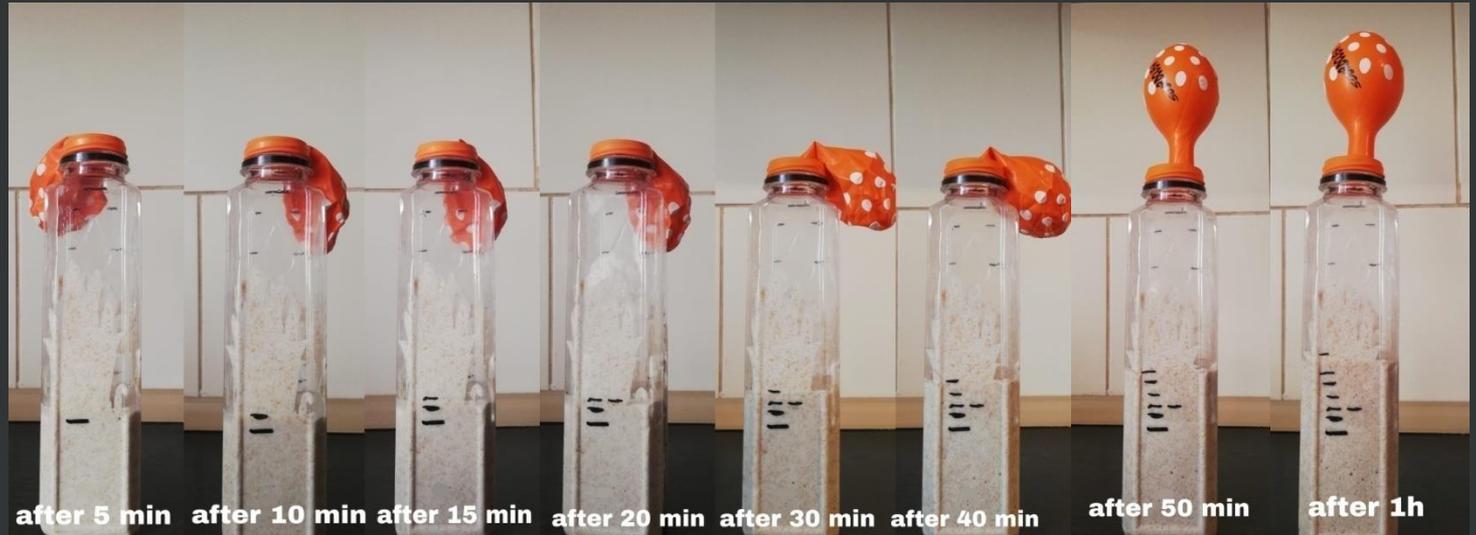


Yeast

Yeast experiment results

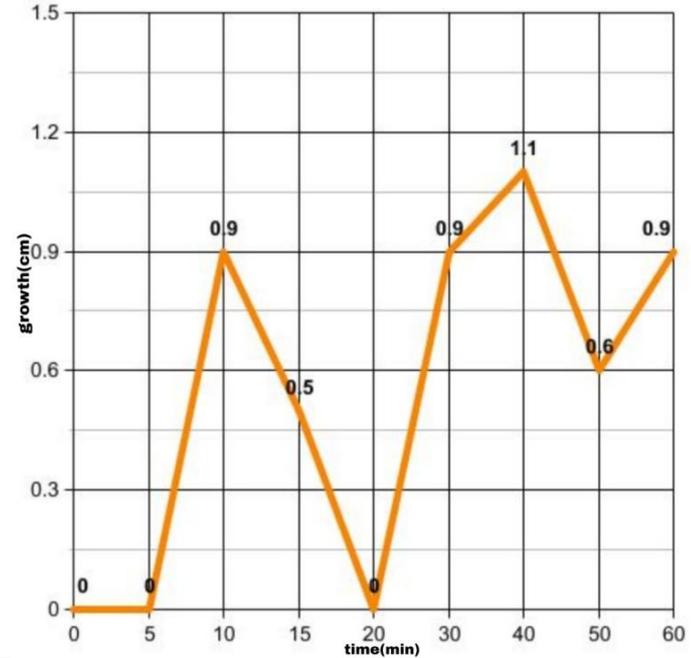
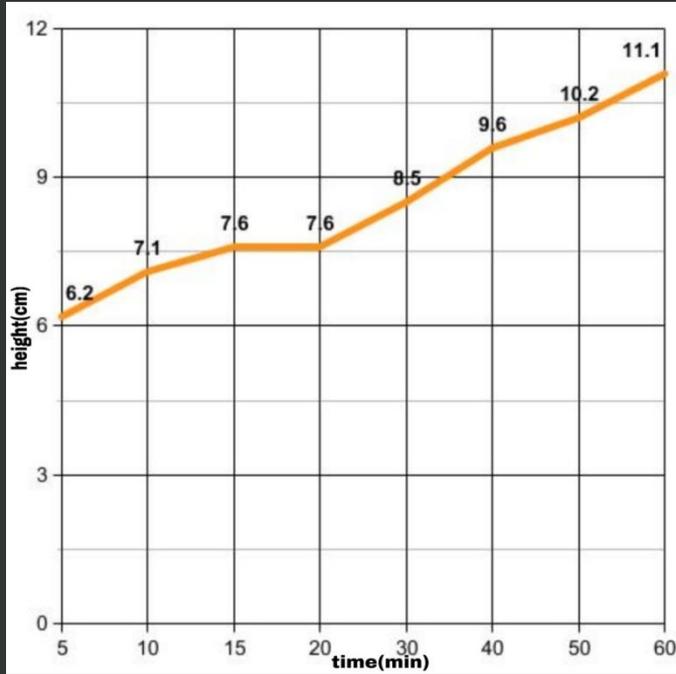


Description of the sourdough experiment



Sourdough

Sourdough experiment results

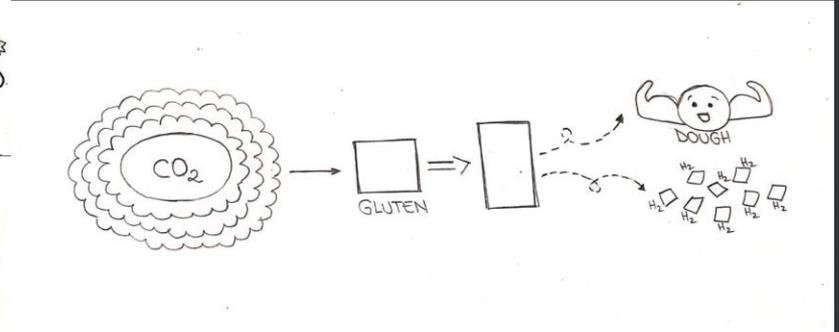
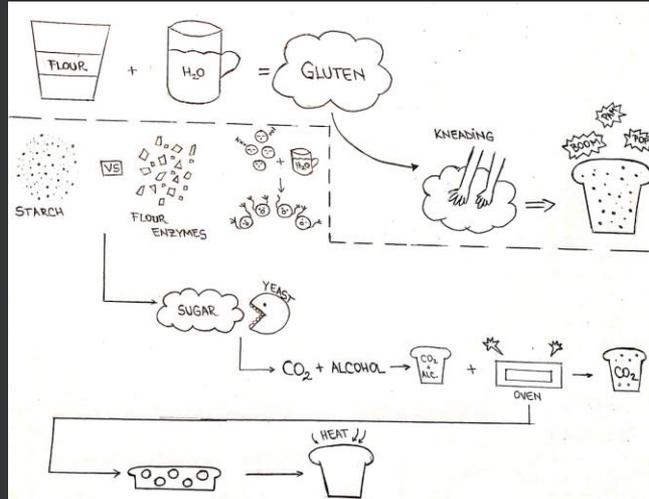


Comparison between the results and interpretation



8.The process of bread making

The kneading process



9. Experiment 3: baking bread with yeast



What will you need?



In the oven

The final product



10. Experiment 4: baking bread with sourdough

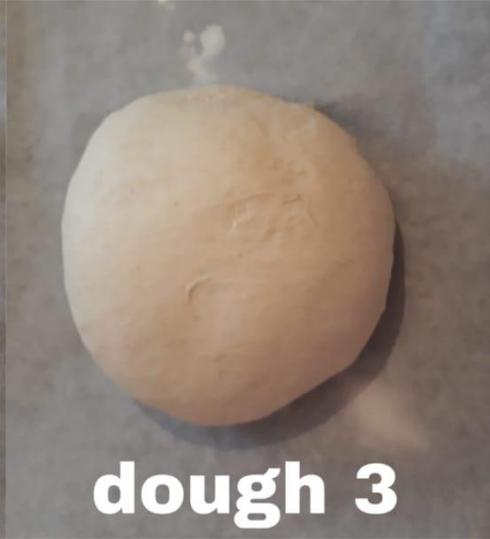
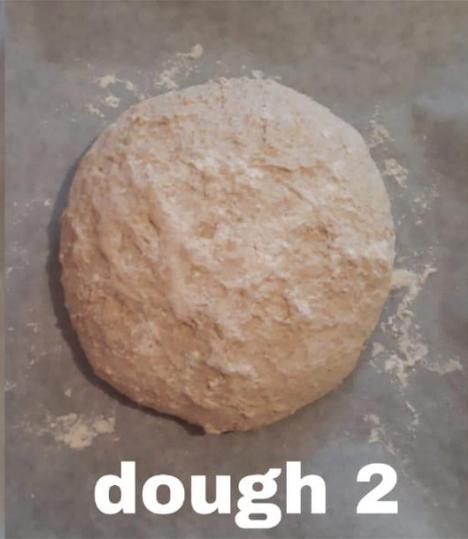
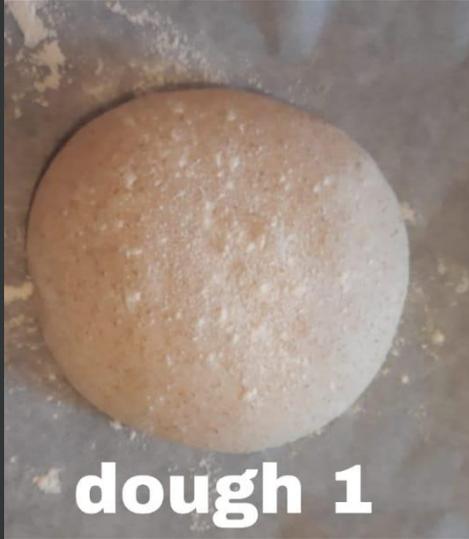
- For this experiment we will bake 3 breads with 2 different types of sourdough starter:
 - 1. Home-made
 - 2. From a local producer

Preferments



- 1. Recipe 1 for preferment:**
 - 20g home-made sourdough
 - 140mL water
 - 110g flour
- 2. Recipe 2 for preferment:**
 - 20g home-made sourdough
 - 125 mL water
 - 150g flour
- 3. Recipe 3 for preferment:**
 - 60g sourdough from a local producer
 - 30mL water
 - 90g flour

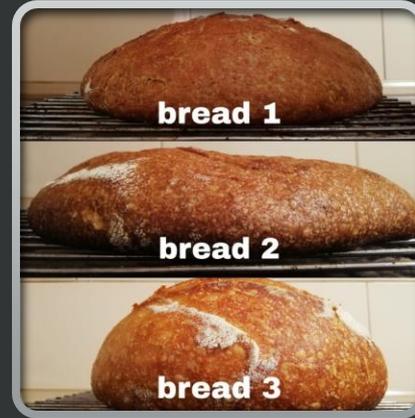
Doughs

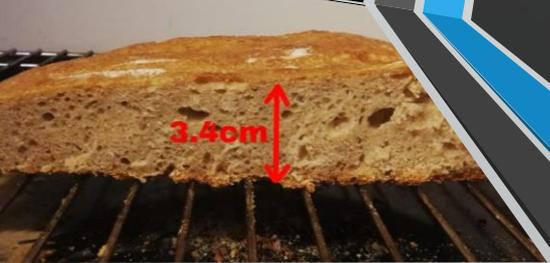
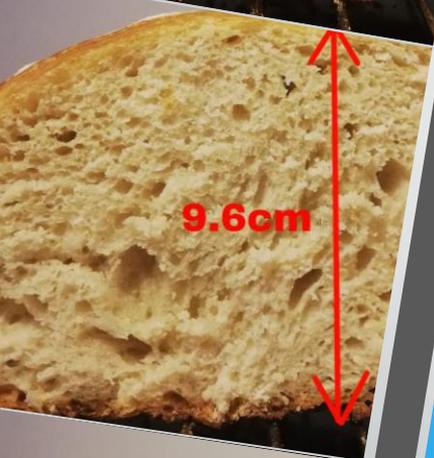


Final products



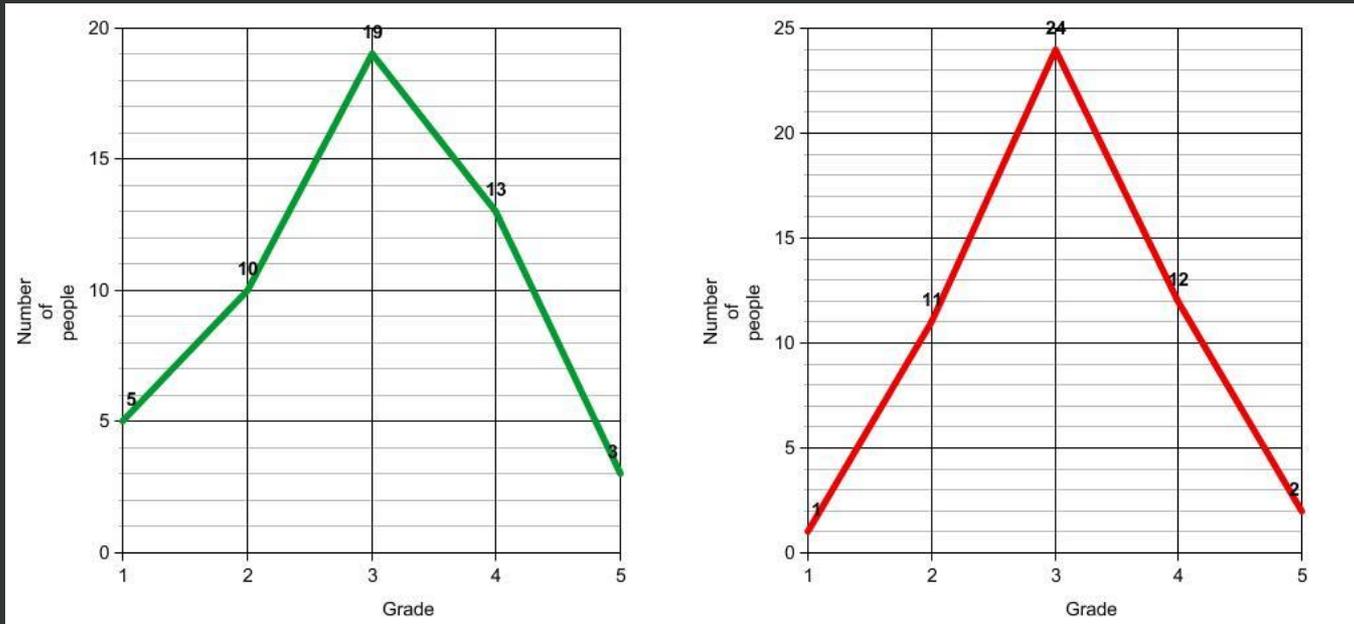
Comparison





Comparison

Taste Analyze: people's opinion



Sourdough bread

Yeast bread

12. Expiration data



13. Economical comparison

I've been to a local factory and interviewed directly the owner. I asked him about the prices, making-time and selling report.



	Homemade bread's price	Factory bread's price
Sourdough bread	0.9 euros	1.4 euros
Yeast bread	1.06 euros	1.2 euros

Time comparison

	Kneading time	Resting time	Baking time
Sourdough	15mins	7hours	1hour
Yeast	15mins	1hour 30mins	1 hour

For the sourdough bread we add:

- 5 days, 10 mins a day for making the sourdough starter
- 20 mins for making the preferment

14. Conclusions

- There is no such thing as the perfect bread, or the “right” recipes because the people’s perception can vary and it’s very personal.
- The rising agent have a big influence on the characteristics of the final product: it affects the shape, the weight, the volume, the density and obviously the chemical compounds and taste.
- The sourdough bread takes a lot more time to be made but it’s healthier and cheaper.
- All the basic ingredients are needed for a good final product and each of them plays an important role in bread-making.

15. Possible errors

1. Measuring errors and approximations
2. Little quantity loses during kneading or mixing
3. Lack of experience in sourdough making

16. Bibliography

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Thank you!

