

eman ta zabal zazu



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Vital
FUNDACIÓN · FUNDAZIOA



HOW CAN WE DETECT GLUTEN IN FOOD?

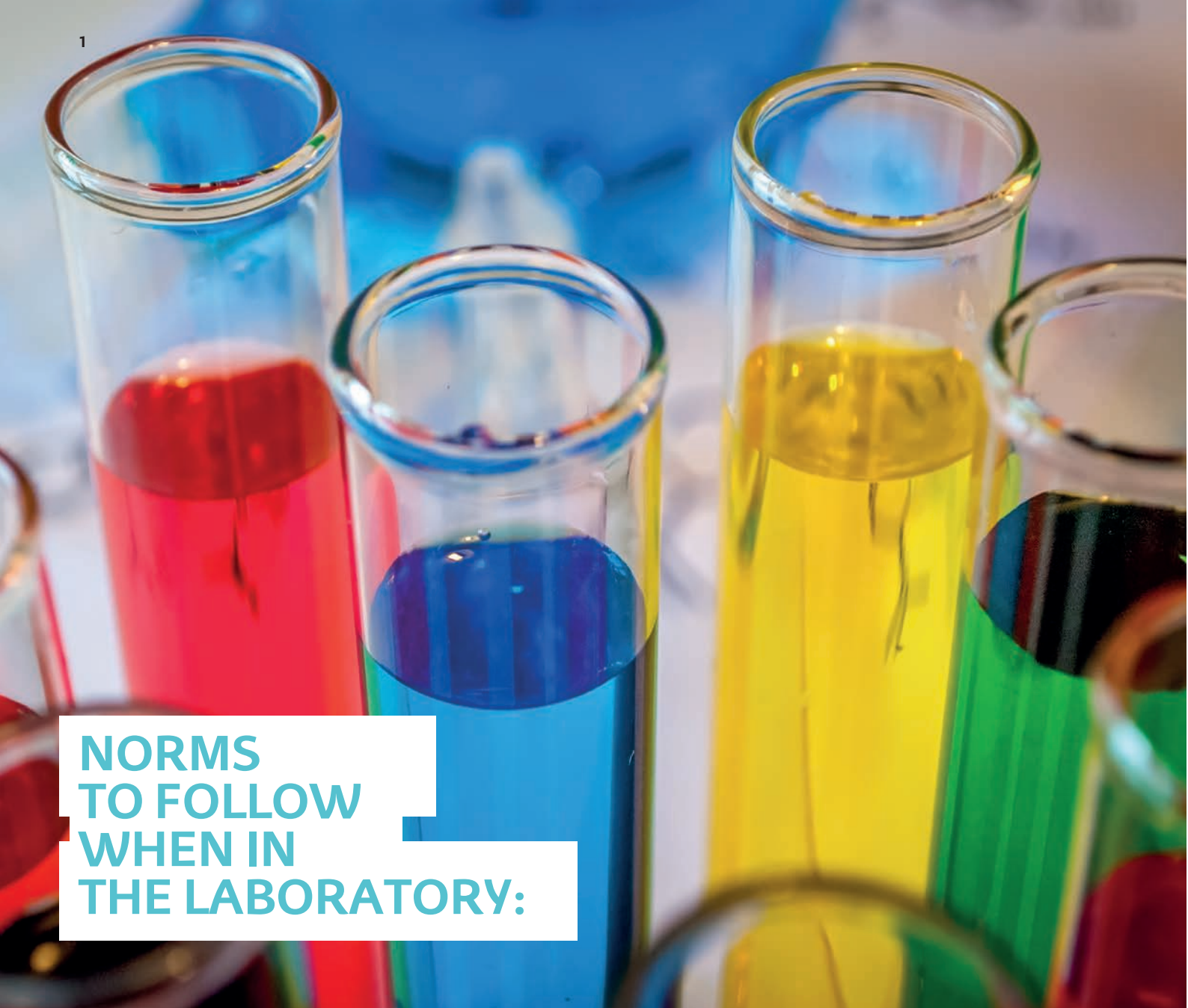
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Authors



GLUTEN3S





NORMS TO FOLLOW WHEN IN THE LABORATORY:

- 01 Go into the laboratory slowly and in an orderly way.
- 02 If you have long hair, tie it back.
- 03 Put on your gown before entering the laboratory. And if necessary, safety glasses and gloves as well.
- 04 Do not leave objects like coats or backpacks on the table.
- 05 In the laboratory, work without haste and keep the table clean and tidy.
- 06 Before starting, read the script of the experiment and, if you have any questions, ask the teacher or the people in charge of the laboratory.
- 07 Check that you have ready on the table all the material needed to do the experiment.
- 08 If the material to be used is dangerous, follow the teachers' instructions. For example, if you are going to use glass, check that it is not cracked.
- 09 If you are going to use an instrument, check that it works. If not, tell the teacher.
- 10 At the end of the experiment, clean the material used and put it back.
- 11 After working in the laboratory, wash your hands.

1st EXPERIMENT

Which kind of flour gives dough elasticity?

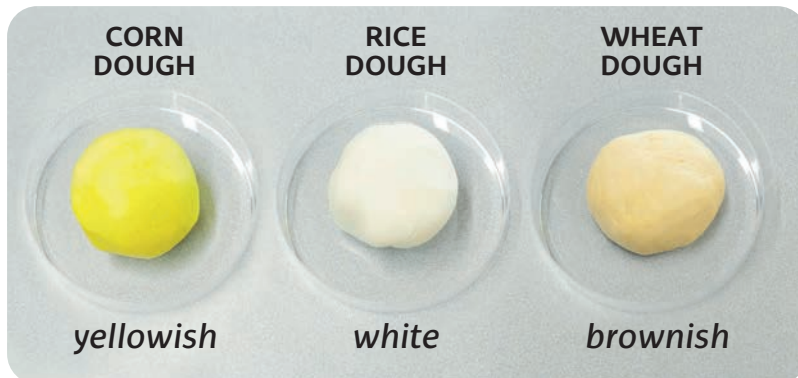


MATERIAL

- Rice flour
- Corn flour
- Wheat flour
- Water
- Container
- Test tube
- Tape measure

PROCEDURE

- You have to make three different doughs, one with each flour; Weight 100g of each flour, make a bowl in the center and add water. Use the test tube to measure the volume of water:
 - Wheat flour: 60mL water
 - Rice flour: 65mL water
 - Corn flour: 90 mL water
- In the container, mix everything until you get homogenous doughs: yellowish, white and brownish respectively.



- Cover with a handkerchief and let stand 10 minutes.
- Take the dough in your hands and stretch it as much as you can, without breaking it.
- Measure the length of each type of dough (in cm) with the help of a tape measure and fill in the following table with your results.

RESULTS

DOUGH	LENGTH (cm)
Corn Dough	<input type="text"/>
Rice Dough	<input type="text"/>
Wheat Dough	<input type="text"/>

CONCLUSIONS

What flour gives the dough elasticity?

Why are some doughs more elastic?

2nd EXPERIMENT

What happens if we put the doughs under water?



MATERIAL

Corn dough
Rice dough
Wheat dough
Tap water

PROCEDURE

1. Take the doughs one at a time and put them under the tap water, use cold water.
2. Knead each dough in the water:
 - a. The water at the beginning goes whitish.
 - b. When the water is transparent and the mass is sticky we can say that the experiment has finished.
3. Describe your results and mark with an "X" the correct answer in the following table.

RESULTS

Describe what happened when you put each type of dough under running water:

a) Corn dough: _____

b) Wheat dough: _____

c) Rice dough: _____

HAS IT COMPLETELY DISSOLVED?

	YES	NO
Corn dough	<input type="checkbox"/>	<input type="checkbox"/>
Wheat dough	<input type="checkbox"/>	<input type="checkbox"/>
Rice dough	<input type="checkbox"/>	<input type="checkbox"/>

Describe the substance that has not dissolved. What does it look like? What does it remind you of?

CONCLUSIONS

What differences did you observe after holding the three doughs under running water? _____

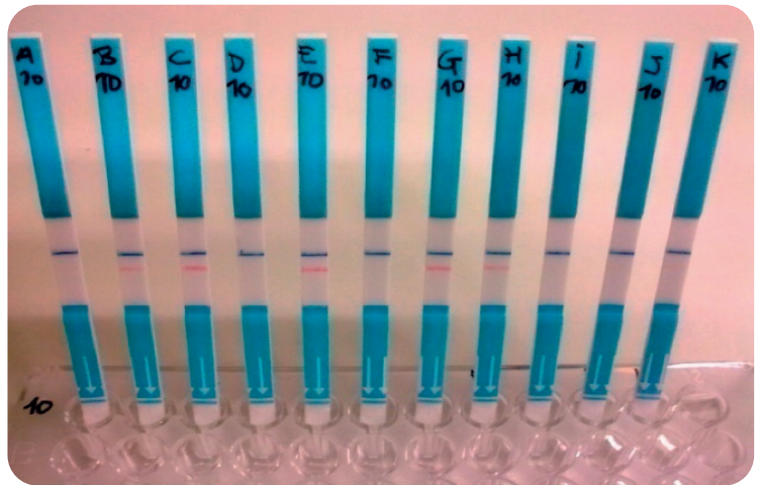
What was left in your hand? What characteristics does this substance have? _____

3rd EXPERIMENT

How can we detect if a food has gluten?

MATERIAL

Food
Test tubes
Immunochromatographic strips
Spatula
Chopper
Pipettes
60% ethanol
dilution buffer



PROCEDURE

1. Take approximately 5 g of each sample and homogenize it until very small fine pieces are obtained.
2. Weigh 1 g in a test tube.
3. Add 10 ml of 60% ethanol.
4. Stir it for 30 seconds (better still with a vortex).
5. Filter it with filter paper or let it decant for one minute.
6. Take 500 μ L of the dilution buffer in a test tube and add 50 μ L of the previous filtrate or clean liquid. If you do not have micropipettes, keep these proportions by taking more of each (0.5 mL of sample + 5 mL of buffer dilution).
7. Take a detection strip and insert the arrow part into the test tube (do not let the liquid overflow the limit indicated. If there is too much liquid, put enough into another tube).
8. Wait 5 min, test the samples (without homogenizing) and read the result. The blue line is the control (this should always appear; if it does not, this means that there has been a problem and the analysis should be repeated). The red line will only appear in the samples with gluten, and it is a sign that the gluten has bound to the antibodies housed in the strip.

RESULTS

red line

A	<input type="checkbox"/>	C	<input type="checkbox"/>	E	<input type="checkbox"/>
B	<input type="checkbox"/>	D	<input type="checkbox"/>	F	<input type="checkbox"/>

CONCLUSIONS

Did you know which the sample with gluten was before you saw the result? Why?

Is it possible to know if a sample has gluten before analyzing it?



4th EXPERIMENT

Can we tell through the senses if bread has gluten?

MATERIAL

Bread with gluten
Gluten-free bread
Knife



PROCEDURE

1. Take a slice of each bread.
2. Perform this sensory analysis: a) touch, b) sight, c) taste and d) smell.
3. Use the table below to summarize the results of the analysis.

a) TOUCH TEST

Squeeze the slice between your fingers. Does it return to its initial state? Mark your answers with an "X":

	YES	NO
Bread with gluten	<input type="checkbox"/>	<input type="checkbox"/>
Gluten-free bread	<input type="checkbox"/>	<input type="checkbox"/>

b) EYE TEST

Observe the size of the bread. What differences do you notice? Mark the answer with an "X":

	Small	Big
Bread with gluten	<input type="checkbox"/>	<input type="checkbox"/>
Gluten-free bread	<input type="checkbox"/>	<input type="checkbox"/>



c) TASTE TEST

Take a little piece of each bread and try it. Does it break into pieces? Mark with an X"

	YES	NO
Bread with gluten	<input type="checkbox"/>	<input type="checkbox"/>
Gluten-free bread	<input type="checkbox"/>	<input type="checkbox"/>

How many times do you have to chew each mouthful of bread before swallowing it?

Bread with gluten	<input type="text"/>
Gluten-free bread	<input type="text"/>

Which one would you say is the taste of ordinary everyday bread? Mark with an X"

Bread with gluten	<input type="checkbox"/>
Gluten-free bread	<input type="checkbox"/>

d) SMELL TEST

Smell the bread samples from cans A and B. Which one do you think is the bread you eat each day? Mark the answer with one X"

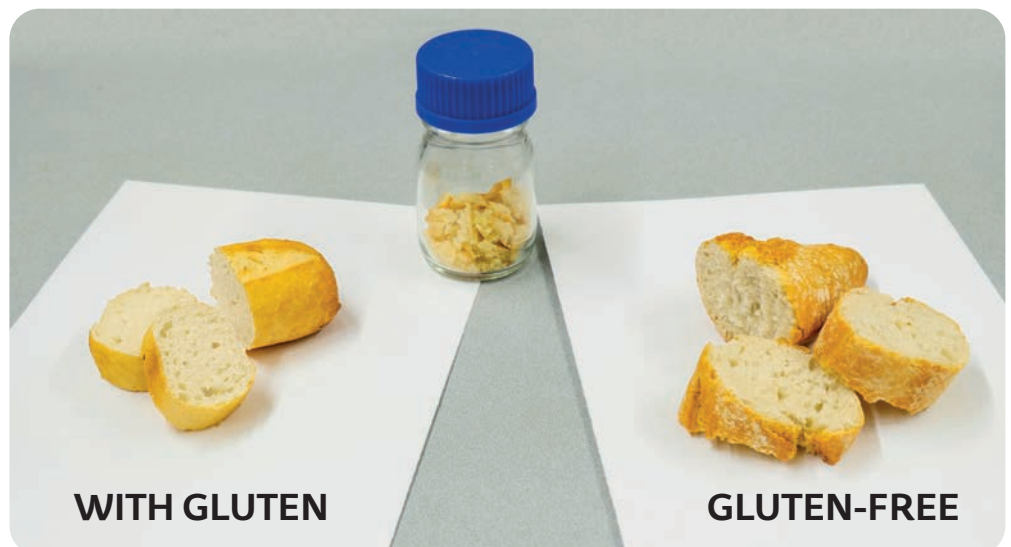
Jar A

Jar B

Wich one have you marked?

Bread with gluten

Gluten-free bread



CONCLUSIONS

What can you conclude after performing the sensory analysis?

Have you correctly identified bread with and without gluten? Why?

Which bread did you like the most?

5th EXPERIMENT

How do the researchers communicate with the consumer?

MATERIAL
 Food packaging
 Posters with gluten symbols



In your opinion, what do you think the following symbols mean?

a)



b)



c)



PROCEDURE

1. Taking into account the symbols above, look at the containers and fill in the following table.

RESULTS

NAME OF THE FOOD	DOES IT HAVE GLUTEN?	
	YES	NO
_____	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>

CONCLUSIONS

Is it easy for celiacs to identify what they can and cannot eat?

And what if they have to consume loose unpacked food? What will they do?

