



MARY  
KATHERINE

1/9/08

## #47 The Yeast of our worries

To break down the starches to get nutrients from sugar for energy.

### Question

How does temperature affect digestion and energy production

### Background Info:

Yeast grows faster in warm temperatures

### Guesses:

The yeast with warm water will grow more quickly.

### Manipulated:

The temp. of the water

### Responding:

Amount of energy produced by yeast

### Controlled:

Amount of water, Amount of yeast, amount of starch

### Materials:

- 2 flasks
- 2 balloons
- 2 packets of yeast
- 20 grams of sugar
- 180 ml of water
- bin with warm tap water

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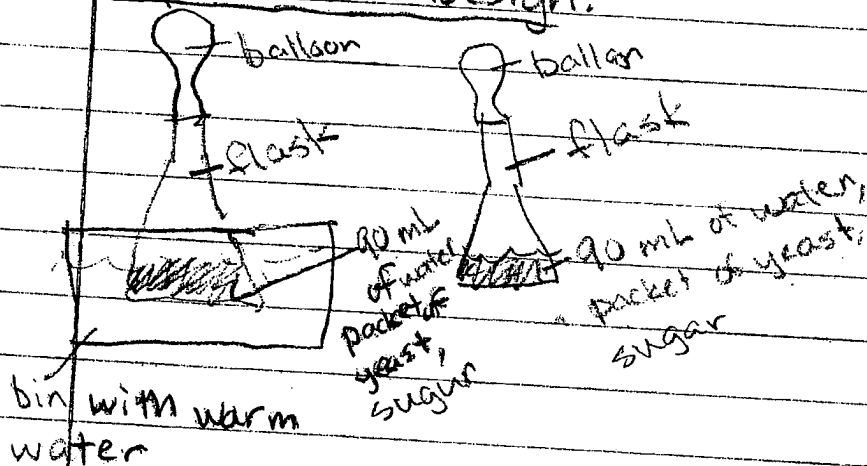
Hypothesis:

and will  
not digest  
as quickly

If we test if the temp. of water affects yeast digestion and respiration

The yeast in cold water won't produce as much energy because yeast needs warm temps. to grow. I think

Experimental Design:



Procedure:

1. fill one flask with <sup>90 ml</sup> warm water, one with cold
2. Add 10 grams of sugar to each flask
3. Put 1 packet of yeast in each flask and cover w/ balloon quickly
4. Put flask w/ warm water in bin filled w/ warm water
5. Record Data every 5 min. for 20 min

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Day	Amount of solution (ml)		of balloon			
	Warm	Cold	Warm	Cold	Warm	Cold
Day 1	Amount of solution (ml)		height (cm)		Circumference (cm)	
5 min	175 ml	100 ml	11 cm	12 cm	16 cm	0 cm
10 min	129 ml	100 ml	13 cm	0 cm	22 1/2 cm	0 cm
15 min	150 ml	100 ml	14 cm	0 cm	27 cm	0 cm
20 min	1	...				
Day 2						
5 min	120 ml	100 ml	13 cm	12 cm	19 cm	20 cm
10 min						
15 min						
20 min						
0 min	100 ml	100 ml	0 cm	0 cm	0 cm	0 cm

## Prediction

I think that the yeast in warm water will digest and resinate faster than the yeast in cold water because the warmth makes the cells stressed so they feel like they have to reproduce.

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### Conclusion

We found out that temperature does affect cellular respiration and extracellular digestion.

For warm water, the highest level of solution in the flask was 150 ml and the lowest was 75 ml. The balloon on the flask with warm water had a circumference of 27 cm at it's highest and 16 cm at it's lowest. The solution in cold water stayed at 100 ml. The balloon on the flask with cold water had a circumference of 20 cm at it's highest and 0 at it's lowest.

The yeast in the warm water made the balloon inflate much faster than in cold water because the cells become stressed and reproduce and do cellular respiration and extracellular digestion faster. When they do this, they produce energy and release carbon dioxide faster which makes the balloon inflate.

### Questions

1. Do yeast need to release enzymes to break down starches or can they skip that process?
2. If yeast have too many nutrients, will it produce more carbon dioxide or less?
3. Why will yeast stop reproducing in cold water if they already started?