

Poptastic

Grain Sorghum Popcorn

Health and Nutrition, Science, Math

Materials

Large pot
Spoon
Protective gloves
Splatter screen
Oil
1/2 cup of Grain Sorghum kernels per person
Regular popcorn
Napkins or plates

Overview

Students will have the opportunity to learn more about grain sorghum and have a tasty treat when they are done. This lesson demonstrates that grain sorghum has more uses than just livestock feed and some food items, but that it can also be popped.

Objectives

1. Students will hypothesize the outcome of popping grain sorghum.
2. Students will compare and contrast popped grain sorghum with regular popcorn.
3. Math Objective: Real-world use of fractions.

Background Information

Sorghum grain is gluten free. Gluten free foods are needed by people suffering from celiac disease. Celiac disease causes mild to severe distress of the digestive system. Sorghum is nutritionally high in fiber, protein and iron. It is also antioxidant-rich, which is believed to lower the risk of some health related diseases. These grains are able to be popped because their soft hull easily disintegrates when heated. Unlike making popcorn, you are able to eat the sorghum kernels that did not pop because the hull disintegrated during heating. How do the kernels pop? When they are heated quickly, steam builds and then pushes against the hull. Once it is hot enough and there is enough pressure, the steam pops the kernel.

Preparation

Make a bowl of regular popcorn so that the students can compare the regular popcorn with the popped grain sorghum. Prepare all of the supplies for the students to do their grain sorghum

Grade Level: K-12

Time: 20-30 minutes

Standards:

Math

- Apply understanding of operations with fractions
- Analyze proportions to solve real-world problems
- Graphing results
- Compare and Contrast

For Kansas standards, visit www.ksde.org



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popcorn experiment.

Procedures

1. Have a bowl of regular popcorn prepared for the students to taste.
2. Have the students hypothesize what the outcome will be when heating grain sorghum kernels.
3. Put stove on medium heat.
4. Pour oil into the large pot and allow to heat up first.
5. Add grain sorghum to pot (be sure that gloves are worn and splatter screen is used).
*No need to put lid on.
6. Once the grains start to pop, turn the heat down.
7. Stir continuously, being sure that the already popped grains don't burn.
8. Add flavoring or salt, if desired.
9. Pour the sorghum out onto plates or napkins for each student and have them try it.
10. Have them taste the regular popcorn to use as a comparison.
11. Have the students compare the regular and grain sorghum popcorn using the compare and contrast worksheet.

Want More? Extensions:

Other experiment ideas:

- Soak the grains for a few hours, and then try popping them. Will the extra water help or hinder them in popping?
- Will the sorghum grains pop below the temperature at which water turns to steam?
- If you score/pierce the hull of the grain before popping it, how would that affect their ability to burst?

For more information on grain sorghum nutritional facts, visit:

<http://sorghumcheckoff.com/food/nutrition-information/>

http://sorghumcheckoff.com/wp-content/uploads/2012/06/2014_09_18_UpdatedNutritionInfo_FJ1.pdf

Kansas Crop Educators Guide: pages 45-46



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Name: _____

Date: _____

Instructions: Answer questions thoroughly.

1. $\frac{1}{2}$ cup of grain sorghum kernels equals 3 cups of popped kernels. This is equal to one serving. How many cups of kernels do you pop to feed six family members and yourself?

$$\frac{1 \text{ serving}}{.5} = \frac{\text{number in family}}{X}$$

2. How many cups of grain sorghum are needed to feed your whole class?

$$\frac{1 \text{ serving}}{.5} = \frac{\text{number in class}}{X}$$



Poptastic Sorghum Grain Nutritional Information

Nutrient	Unit	Value per 1/2 cup (unpopped)
Proximates		
Water	g	11.9
Energy	kcal	316
Protein	g	10.2
Total Lipid(fat)	g	3.32
Carbohydrate, by difference	g	69.21
Fiber(total dietary)	g	6.45
Sugars(total)	g	2.43
Minerals		
Calcium, Ca	mg	12.5
Iron, Fe	mg	3.23
Magnesium, Mg	mg	158.5
Phosphorus, P	mg	277.5
Potassium, K	mg	348.5
Sodium, Na	mg	2
Zinc, Zn	mg	1.61

*Source: National Grain Sorghum Website



Poptastic Compare and Contrast

Please rank the following criteria from 1-5, with 5 being the best.

	Flavor	Texture	Volume	Satisfaction	Color
Sorghum Grain	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Popcorn	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5

*Graph the results using information from each student.

