SORGHUM
Nature's Super Grain®

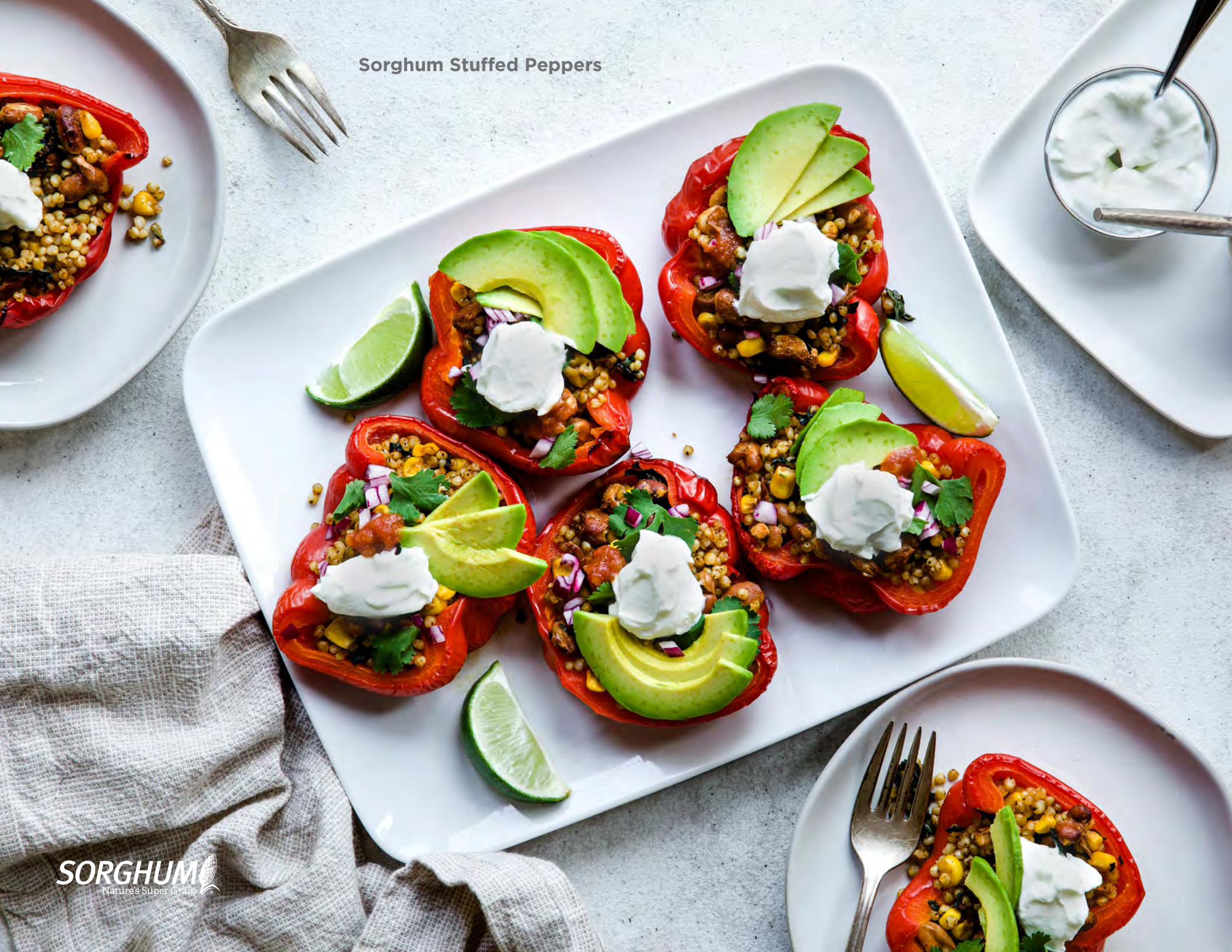
Sorghum Goes to School

A new superhero grain has arrived in US schools (from US farms!)

Sorghum Farm-to-School Toolkit

School Foodservice Guide

Sorghum Stuffed Peppers



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THE SCOOP ON NATURE'S SUPER GRAIN™

Sorghum, a staple food around the world, now credits as a whole grain in USDA's Food Buying Guide. Though it is an ancient grain[1], sorghum is gaining new popularity with American consumers as a tasty, nutrient-dense, naturally gluten-free whole grain. Delicious and versatile with a neutral, nutty flavor, sorghum is a standout in both sweet and savory bowls, baked goods made from whole sorghum flour, entrées, soups, breading, salads and even popped as a snack!

Sorghum is the perfect ingredient for school foodservice directors looking for new ways to excite and entice students to enjoy a new nutrient-dense staple. Recently, whole grain sorghum and whole grain sorghum flour have been included in the USDA Food Buying Guide for Child Nutrition Programs[3], giving directors another great option for meeting the 80 percent whole-grain rich requirement.

This guide is designed to introduce you to this amazing grain and provide the support, guidance and inspiration you need to incorporate sorghum into your school meal programs.

WHAT IS AN ANCIENT GRAIN?

While there is no precise definition of the term "ancient grain," the Whole Grains Council describes ancient grains as those that have been essentially unchanged for at least the last several hundred years[1]. Sorghum has a long history of cultivation in harsh environments to nourish both people and animals. The origin and first known domestication of sorghum occurred in Northeastern Africa. Genetic material from an archaeological dig near the Egyptian-Sudanese border dates sorghum to 8,000 BCE[2].

AROUND THE WORLD

Sorghum has long been an important grain for humans and is a dietary staple for 500 million people in 30 countries in Africa and Asia[4]. Even today, most of the world's sorghum consumption is centered in China, Africa and India[5,6]. Sorghum in various forms is also used worldwide for animal feed, biofuel, building material, fencing, pet food, and even floral arrangements[5].

THE AMERICAS

The first report of sorghum in the United States is attributed to Benjamin Franklin's 1757 writings about "broomcorn" (a variety of sorghum used in broom making). While not indigenous to the Americas, Native populations in the Southeastern United States have long embraced sorghum as an important cultivated crop, utilizing all parts of the plant with a particular emphasis on the production of sweet syrup from the stalks. The Coharie tribe in North Carolina has relied on sorghum as a staple subsistence crop[7]. Mexico also ranks among the world's top sorghum-consuming nations[6].

Modern-day sorghum production is firmly centered in the United States, the world's leading producer and exporter of sorghum. The Sorghum Belt extends from South Dakota to Texas. Kansas leads the nation and world in production with over 3 million acres devoted to growing sorghum[5].

NUTRITION

Sorghum earns the title as Nature's Super Grain™ because of its rich nutrient profile. A complex carbohydrate which is naturally gluten-free, sorghum contributes a plethora of nutrients to your cafeteria trays including[8]:

- **PROTEIN**
- **ZINC**
- **NIACIN**
- **VITAMIN B6**
- **MAGNESIUM**
- **SELENIUM**
- **IRON**
- **FIBER**
- **THIAMIN**
- **COPPER**
- **PHOSPHORUS**
- **MANGANESE**

Research on sorghum in human health also highlights many plant-based compounds that contribute to blood sugar control, cancer prevention and a reduced risk of heart disease[9]. Sorghum grain is considered a functional food, because it includes a number of phenolic acids, flavonoids, and phytosterols, plant-based chemicals that are being studied for their anti-inflammatory and health-promoting effects[9,10,11].

The Dietary Guidelines for Americans, 2020-2025 reports that while most Americans eat plenty of refined grains, 98 percent of Americans currently fall short when it comes to whole grain intake[12]. Whole grain sorghum and whole grain sorghum flour can help to close that nutrition gap. The USDA MyPlate food guide recommends making half of the grains consumed whole grains, and includes sorghum in the MyPlate whole grains gallery[13].

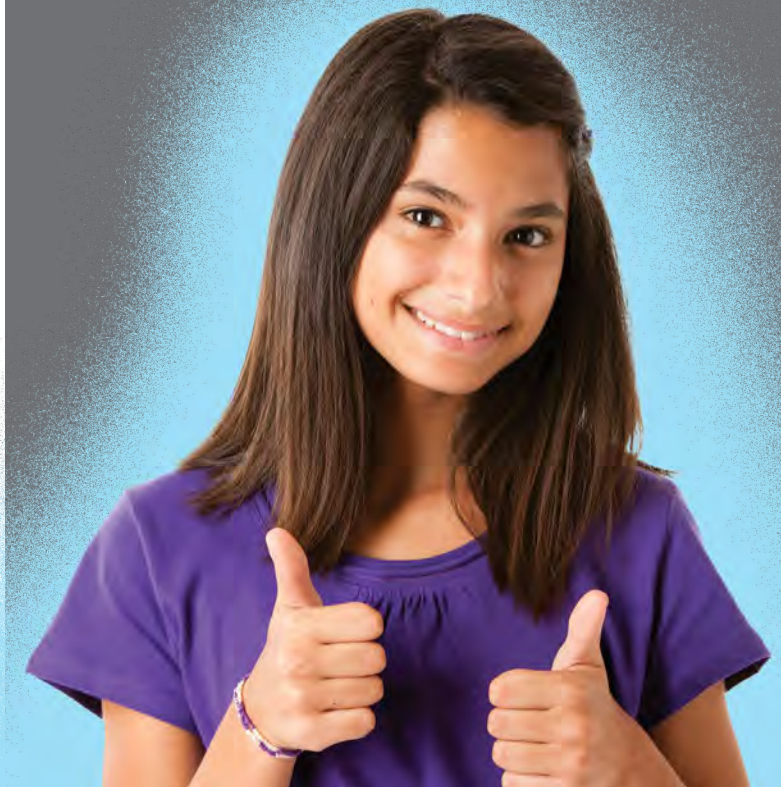
ENVIRONMENTAL CHAMPION

Sorghum is an important agricultural crop that thrives in challenging environments while giving back to the soil and ecological systems[14].

- **Water Conservation** - Termed The Resource Conserving Crop™, sorghum can be grown in drought conditions and generally requires 30 percent less water than similar grains. Rain is the primary source of water for 91 percent of the sorghum acres in the United States, thereby minimizing the strain on stressed water systems.
- **Soil Health** - In addition to conserving water, sorghum uniquely builds and improves soil health during its growing cycle. The sorghum plant regenerates soil by retaining nitrogen and other soil nutrients. The stalks purposefully left standing in fields after harvest add nutrients, reduce soil compaction, capture moisture and reduce wind erosion.
- **Carbon Sequestration** - Sorghum removes harmful carbon from the atmosphere and stores it safely in the soil, cleaning our air and helping to fight climate change. The crop also has a reduced carbon footprint through conservation tillage practices and nitrogen-use efficiency.
- **Wildlife Habitats** – Sorghum helps wildlife populations thrive, providing a preferred food choice for quail, pheasants and many other species of birds and deer. The leaves and stalks left after harvest provide protection from the elements during harsh winters and extreme summer heat.

SORGHUM & CLIMATE CHANGE

> Many underused plant species have excellent nutritional profiles, as well as traits of interest for adapting food production to climate change (i.e., quinoa, millet, sorghum, or teff for grains, or zapote, chaya, or chenapodes for fruits and legumes). These qualities are especially important considering the increasing risk that climate change will pose on crop yields and the nutritional content of foods.
>
> 2019 EAT Lancet Commission[15]



MEET A SORGHUM FARMER!

"We know that the sorghum we grow on our farm offers big benefits for our health and the health of our children.

Nutritionally, sorghum is a whole grain that's packed with protein, antioxidants, vitamins and minerals—something every growing body and mind needs. Sorghum is also an excellent source of fiber, which aids digestion and gut health.

Having taught in the classroom for nearly two decades, I've seen how proper daily nutrition benefits the bodies and minds of students. Incorporating sorghum into menus helps students fuel their brains while also providing the energy needed for growing, active bodies. Sorghum keeps students from experiencing hunger pangs because it is very filling. If students avoid "feeling hungry," they can better focus on their learning within the classroom."

-Kim Baldwin, Sorghum Farmer

Success with Sorghum

SOURCING

Sorghum is available to school foodservice operations as uncooked whole grain kernels, whole grain flour and as a ready-to-use (RTU) cooked product. Many distributors carry sorghum, but if yours does not, do not hesitate to ask them about availability. If you do not see sorghum listed on your distributor sell sheets, you can also contact The Sorghum Checkoff (*sorghumcheckoff.com/contact-us/*) and they will assist you in sourcing sorghum for your program.

COOKING FOR SCHOOLS

Whole grain sorghum takes 40-55 minutes to cook on the stovetop. The cook time can be cut in half by using a pressure cooker. Cooked sorghum stores exceptionally well, both in the refrigerator and the freezer. During cold or frozen storage, the texture and moisture of the sorghum grain is unaffected, making it ideal for batch cooking. Because of these properties, sorghum can also be used in soups and stews without losing structure[16].

Sorghum flour is an excellent substitute for wheat flour in gluten-free baking. Bakers using sorghum flour in a gluten-free diet often incorporate a binder, such as xanthan gum or cornstarch, to add "stretch" to sorghum flour that is not designated as all-purpose[16].

BAKING WITH SORGHUM FLOUR

Add 1/2 teaspoon of xanthan gum per cup of sorghum flour for cookies and cakes or 1 teaspoon per cup of flour for breads. Other ingredients used as binders in recipes include egg whites, unflavored gelatin, cornstarch and guar gum. Visit The Sorghum Checkoff website for more tips and recipes on successful baking with sorghum flour[16].

LET'S GET COOKING!

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The chart below will assist you with the preparation of uncooked whole grain sorghum in your school kitchen. Times may vary with different types of school equipment. The finished product should be soft but chewy with a mild nutty flavor. It may be necessary to add more water during the cooking process.

COOKING WHOLE GRAIN SORGHUM

Type of Equipment	Dry Sorghum Amount (rinse & drain before cooking)	Water or Stock Amount	Yield (1/2 cup servings)	Cooking Time
Stovetop	3 LBS, 9 OZS	2 GALLONS	55	50-60 minutes
Steam-Jacketed Kettle	3 LBS, 9 OZS	2 GALLONS	55	45-50 minutes
Convection Steamer	3 LBS, 9 OZS	2 GALLONS	55	50-60 minutes
Oven	3 LBS, 9 OZS	2 GALLONS	55	50-60 minutes

For stovetop and steam-jacketed kettle, bring water or stock to a boil. Add sorghum, cover and simmer until liquid is absorbed. Remove from heat and let stand 15 minutes. Fluff with a fork before serving.

When using a convection steamer, combine sorghum and cold tap water in 4 inch half-size steam table pan and cook uncovered. Pull from steamer; cover and let stand 15 minutes. Remove cover; fluff with a fork before serving.

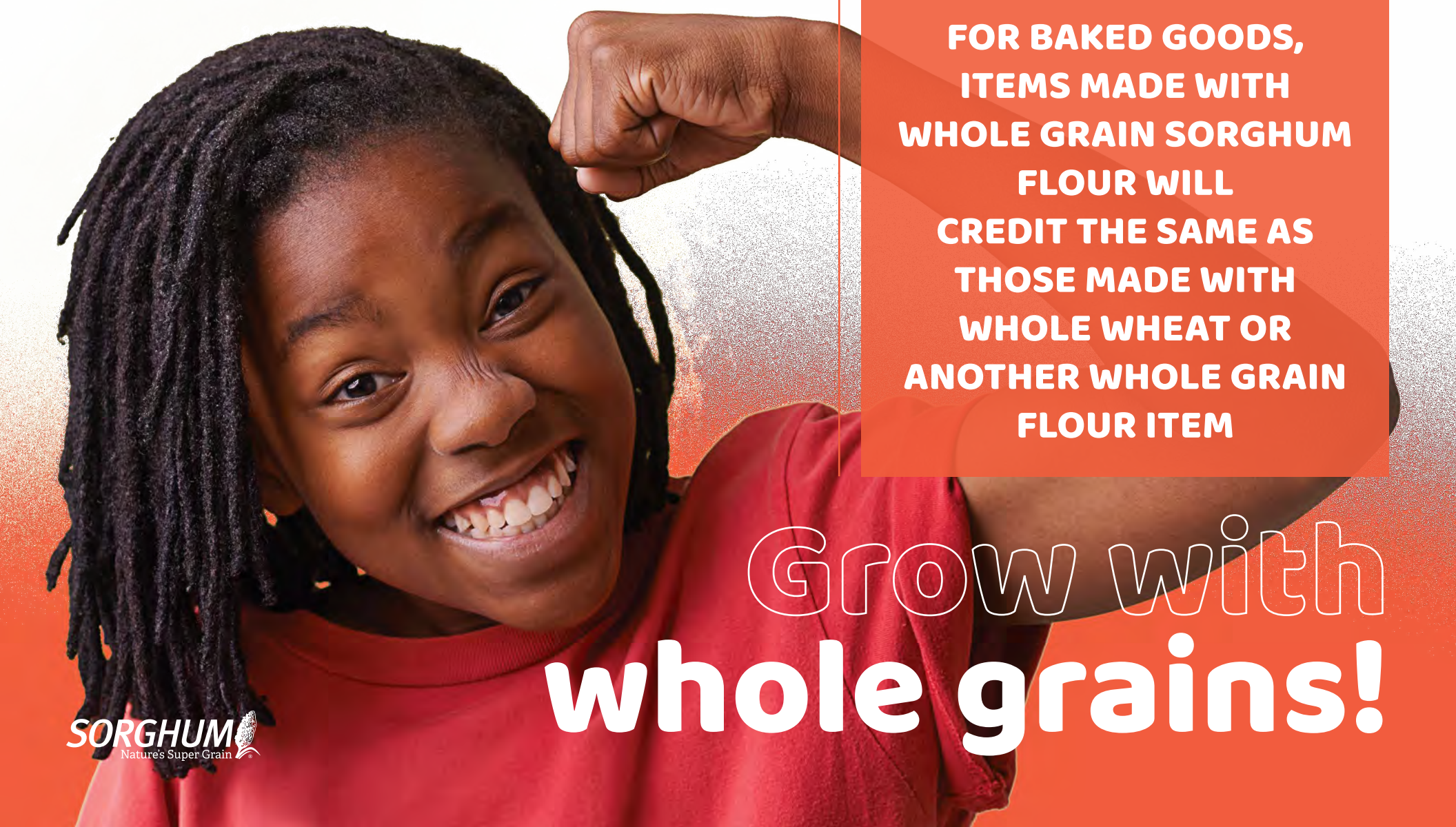
To cook in the oven, preheat convection oven to 325°F or conventional oven to 350°F. Combine sorghum and hot tap water (125°F) in 4 inch half-size steam table pan; stir. Cover pan; place in oven. Bake for time indicated in chart until sorghum is tender and water is absorbed. Remove pan from oven; let stand 15 minutes. Remove cover; fluff with a fork before serving.

CREDITING INFORMATION FOR CHILD NUTRITION PROGRAMS

When using sorghum in the National School Lunch Program (NSLP), School Breakfast Program (SBP), and Child and Adult Care Food Program (CACFP), credit as follows[17]:

½ CUP COOKED WHOLE GRAIN SORGHUM = 1 OZ. EQUIVALENT WHOLE GRAIN

FOR BAKED GOODS, ITEMS MADE WITH WHOLE GRAIN SORGHUM FLOUR WILL CREDIT THE SAME AS THOSE MADE WITH WHOLE WHEAT OR ANOTHER WHOLE GRAIN FLOUR ITEM



Grow with whole grains!

SORGHUM Nature's Super Grain®

RECIPES – SO MANY CREATIVE OPTIONS!

There are so many ways to use sorghum in school foodservice. Served cold on salads or warm in entrées and soups, sorghum is sure to be a winner with your student body and staff. With a few simple modifications, whole grain sorghum flour can be used in baked goods such as muffins, breads and energy bars. Substitute sorghum flour for wheat flour when breading chicken, fish or vegetables.

KANSAS FRIED RICE

Number of Portions: 240 | Size of Portion: 1 cup
Creditable Components: 1 cup = 2 oz. eq. Grain | 1/2 cup = 1 oz. eq. Grain

Ingredients	Measures	Instructions
SORGHUM, WHITE, WHOLE GRAIN	16 LBS	Cook sorghum as directed.
RICE, BROWN, LONG GRAIN, PARBOILED, DRY WATER, MUNICIPAL	16 LBS 26 LBS (3 GALS + 2 CUPS)	Add rice to steam table pan. Add water to cover. Cook in steamer 40 minutes. Stir and cook another 20-30 minutes. Add cooked sorghum and mix together.
OIL, VEGETABLE, SOYBEAN, LOW SAT. FAT PEPPERS, SWT, GRN, FREEZE-DRIED ONIONS, DEHYDRATED FLAKES SALT, GARLIC SALT, TABLE PEPPER, BLACK	16 CUPS 5 CUPS 5 CUPS 4 OZS 3 TBSP + 1 TSP 5 TBSP, GROUND	In large tilt skillet, lightly brown oil, onion, green peppers and garlic salt. Add rice/sorghum mixture, salt and pepper; cook about 15 minutes.
SOY SAUCE, LOW SODIUM EGG, WHL, CKD, SCRMBLD GARLIC POWDER	8 CUPS 60 LARGE 1/2 CUP	Add soy sauce and scrambled eggs. Cook to internal temperature of 140°F. Place in steam table pans. Hold at 135°F or higher.

Source: Kansas Department of Education. Used with permission.

LIME CILANTRO SORGHUM

Number of Portions: 50 | Size of Portion: 1/2 cup
Creditable Components: 1 cup = 2 oz. eq. Grain 1/2 cup = 1 oz. eq. Grain

Ingredients	Measures	Instructions
SORGHUM, WHITE, WHOLE GRAIN WATER, MUNICIPAL SALT, KOSHER	3 1/2 LBS 2 GALS + 1 CUP 1 TBSP	Add sorghum to boiling salted water. Cook, covered, for 50 to 60 minutes until sorghum is tender.
LIME JUICE CILANTRO, FRESH, CHOPPED TOMATOES, FRESH, DICED GREEN ONIONS, SLICED THINLY ON BIAS	2 CUPS 2 CUPS 3 CUPS 1 CUPS	After sorghum is cooked add lime juice, cilantro, tomatoes and green onions.

Source: Healthy School Recipes. Used with permission.

Use this recipe as a tasty side, on the salad bar or as the base of a mixed bowl.

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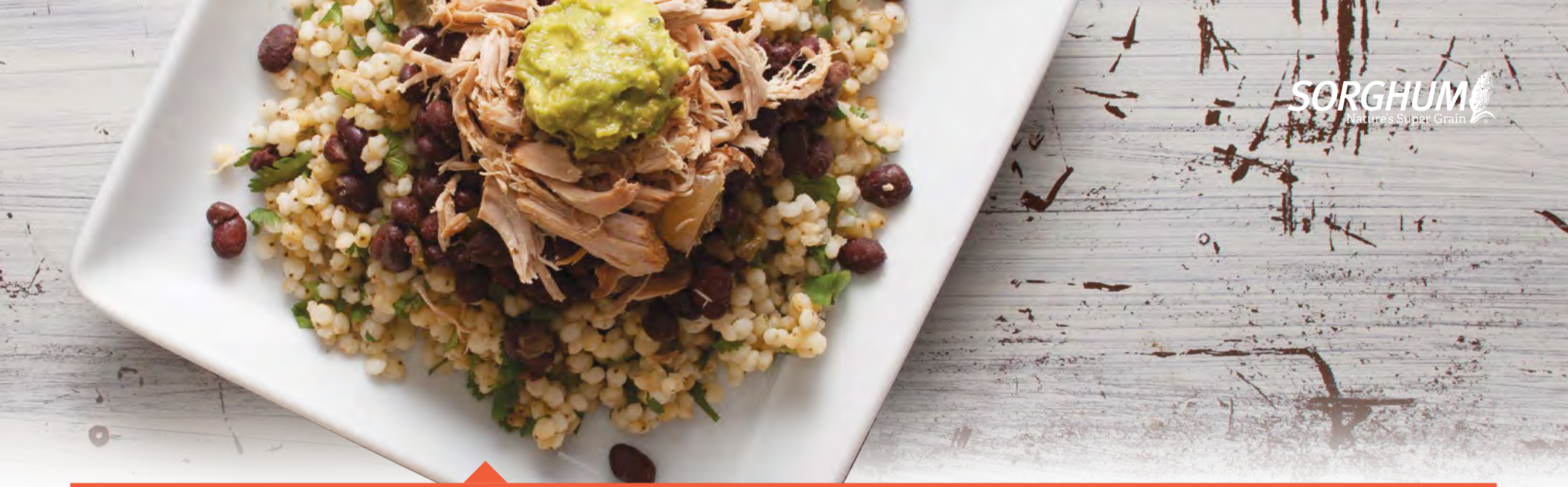

CHICKEN CARNITAS SORGHUM BURRITO BOWL

Number of Portions: 50 | Size of Portion: 1 bowl
Creditable Components: 1 bowl = 1 oz. eq. Grain, 2 oz. eq. meat/meat alternate, 1/2 cup vegetable

Ingredients	Measures	Instructions
LIME CILANTRO SORGHUM (recipe on previous page) CHICKEN OR TURKEY CARNITAS, COOKED BLACK BEANS, CANNED, DRAINED ROASTED PEPPERS, FROZEN AVOCADO, DICED SALSA, CANNED	25 CUPS 7 1/2 LBS 4 1/2 CUPS 12 1/2 CUPS 6 1/4 CUPS 6 1/4 CUPS	Assemble each burrito bowl with the following proportions: 1/2 cup lime cilantro sorghum 2 oz. chicken or turkey carnitas 1/2 cup black beans 1/2 cup roasted peppers (reheated according to package) 1/2 cup avocado 1/2 cup salsa

Source: Healthy School Recipes. Used with permission.

POPPA CHOCKY MUFFIN

Number of Portions: 100 | Size of Portion: 1 muffin
Creditable Components: 1 muffin = 1 oz. eq. Grain

Ingredients	Measures	Instructions
VANILLA EXTRACT OIL, CANOLA	1/3 CUP 2 3/4 CUPS	Preheat convection oven to 350°F. Allow eggs and other ingredients to come to room temperature.
EGG, WHL, RAW, FRSH APPLESAUCE, UNSWEETENED, CANNED	12 LARGE 4 LBS + 2 OZS	In large mixing bowl, mix wet ingredients: vanilla, oil, eggs and applesauce.
FLOUR, SORGHUM WHOLE GRAIN CINNAMON, GROUND BAKING SODA SALT, TABLE COCOA, DRY POWDER, UNSWEETENED SUGAR, GRANULATED XANTHUM GUM	4 LBS + 7/8 OZS 3 TBSP + 1/2 TSP 2 TBSP 1 1/2 TSP 5 1/2 OZS 2 LBS + 10 7/8 OZS 3 TBSP + 1/2 TSP	Mix dry ingredients: sorghum flour, cinnamon, baking soda, salt, cocoa powder, sugar, xanthum gum. Add dry ingredients to the wet ingredients. Stir until combined.
CHOCOLATE CHIPS	1 LB + 6 1/4 OZS	Stir in chocolate chips. Let batter rest for 15 minutes, but no more than 30 minutes. Using a #16 disher, scoop batter into prepared muffin pans. Bake in pre-heated oven at 350°F for 15 minutes.

Source: West Elk Schools USD 282. Used with permission.

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MORE WAYS TO SERVE SORGHUM

Breakfast:

- Serve cooked whole grain sorghum on a hot cereal bar alongside fresh, frozen, dried or canned fruit, yogurt and milk choices.
- Experiment with substituting sorghum flour into favorite muffins, quick breads and energy bars.

Lunch:

- Feature cooked sorghum as an ingredient in poke or other mixed bowls.
- Add a container of seasoned sorghum to the salad bar.
- Add to soups, curries and stews.
- Substitute cooked sorghum for rice in favorite student dishes.

Snacks/After School:

- Offer popped sorghum as an easy healthy snack. (*sorghumcheckoff.com/recipes/popped-sorghum-microwave-recipe/*)
- Serve baked goods made with sorghum flour in your snacks and after school programs.

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immune-boosting nutrients

A serving of cooked whole grain sorghum is an excellent source of protein, zinc, selenium and copper, which may contribute to a healthy immune system.

Marketing this Marvelous Grain

Selling sorghum to your students and staff may require some education and promotion. Like any new recipe or ingredient that you introduce into your foodservice program, you may be met with curiosity and questions. Below are some great ways to generate interest in sorghum.

TASTING!

The best way to interest students and staff is to offer taste samples in the cafeteria, classroom and staff lunchrooms.

- Offer new recipes in small cups for easy tasting.
- Feature and label sorghum and place on the salad bar.
- Offer taste samples served with berries and yogurt at breakfast.
- Use whole grain sorghum flour in baked goods, such as energy bars and muffins.
- Feature a popped sorghum bar. Provide students with cups of popped sorghum and a choice of toppings such as cinnamon, pumpkin pie spice, toasted coconut, chili powder and Parmesan cheese.

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PROMOTION

Be sure to let your school community know that you are offering an exciting new item on your menu. Communicate the exciting story of sorghum with your students, staff and families. Promote the nutrition and health benefits, the environmental contributions and the unique history of this amazing grain. In addition to displaying the posters included in this kit, promote sorghum on school social media channels as well as your school newsletters and websites.

GROWING ACTIVITIES FOR SCHOOL GARDENERS

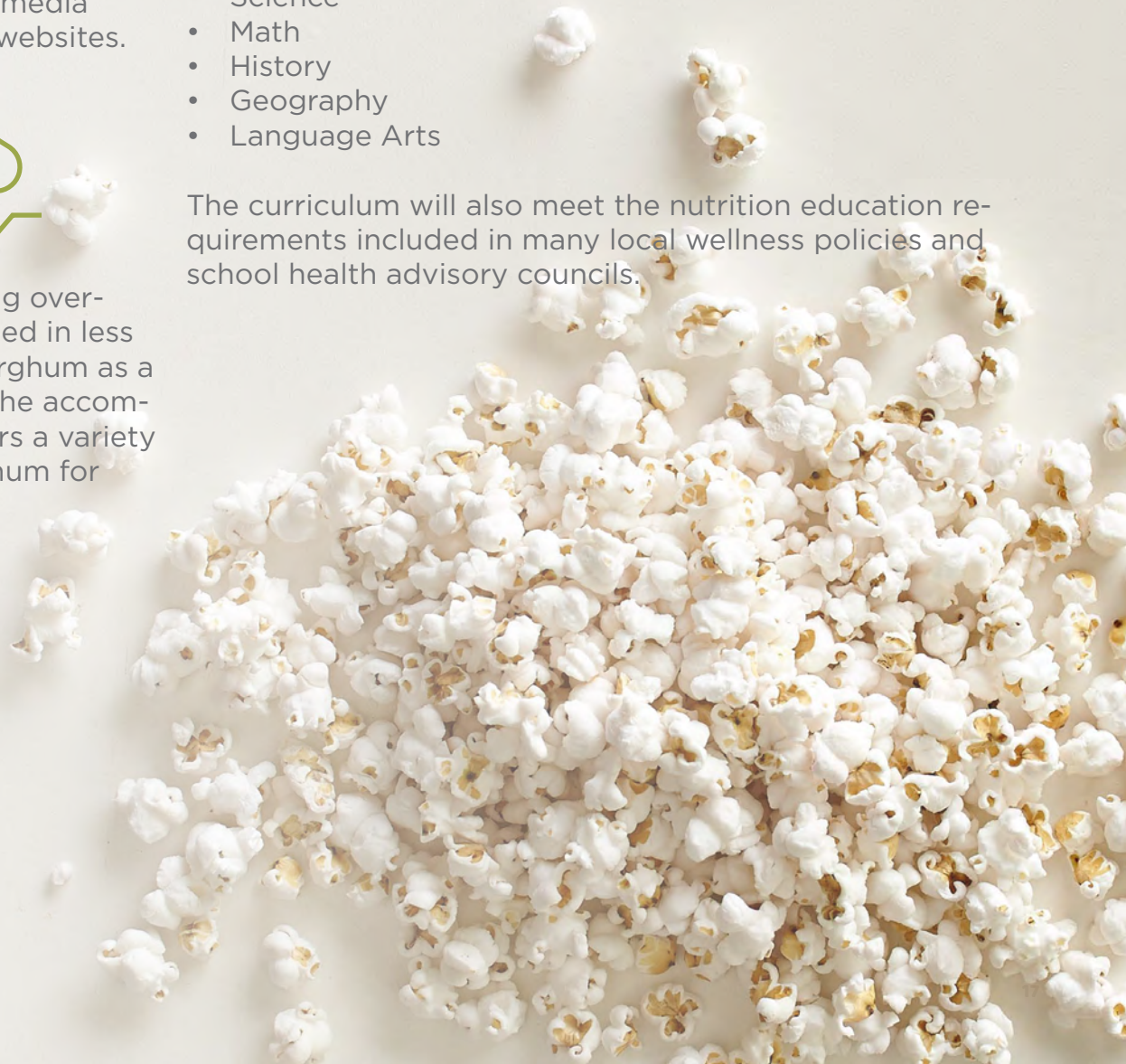
Whole grain sorghum is also a seed! After soaking overnight, it will germinate in a small pot or garden bed in less than a week. Both farmers and gardeners use sorghum as a cover crop that enriches the soil with nitrogen. The accompanying integrated curriculum in this toolkit offers a variety of growing activities and experiments with sorghum for students of all ages.

EDUCATION - CAFETERIA TO CLASSROOM WITH SORGHUM

This toolkit includes an integrated curriculum for grades K to 2nd, 3rd to 6th and 7th to 12th. Please promote it to educators and staff! While focusing on nutrition and health, the curriculum also integrates core subjects:

- Science
- Math
- History
- Geography
- Language Arts

The curriculum will also meet the nutrition education requirements included in many local wellness policies and school health advisory councils.



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SORGHUM THE SMART CHOICE

To learn more about incorporating sorghum into your school, please contact:

United Sorghum Checkoff Program
4201 N. Interstate 27, Lubbock, TX 79403
sorghumcheckoff.com
Follow us @SimplySorghum

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