



# APPLICATIONS OF WHITE SORGHUM IN THE GLUTEN FREE DIET

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# Gluten Sensitivity Spectrum

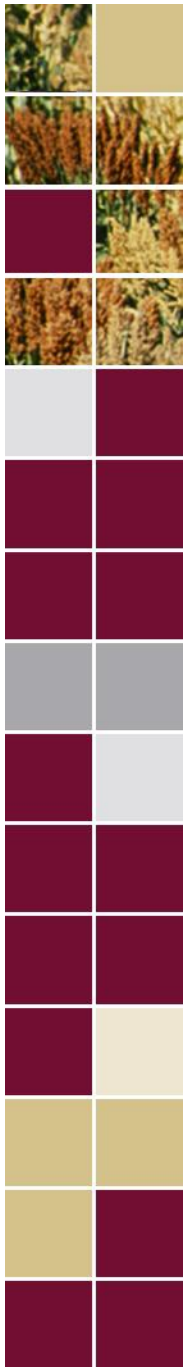
- Celiac Disease
  - Autoimmune disorder triggered by protein found in wheat, rye and barley
  - This is a genetic condition that
- Non Celiac Gluten Intolerance
  - Patients suffer same symptoms of celiac disease, however they do not test positive for celiac. These patients will respond to a gluten free diet.
- Wheat Allergy
  - This is a “true allergy” that is not related to celiac and is fast acting
- These are all conditions that can appear at any point in life.
- The only treatment is a strict gluten free diet.

# Symptoms of Celiac Disease and Gluten Sensitivity

- Gastrointestinal distress
  - Pain, bloating
  - Chronic diarrhea or constipation
- Cognitive challenges
- Irritability / Depression
- Anxiety
- Headache / Migraines
- Inflammation / Joint Pain
- Skin irritation
- Fatigue
- Failure to thrive
- Iron Deficiency Anemia that does not respond to iron therapy
- Tooth discoloration or enamel loss
- Osteopenia or osteoporosis

# The “gluten” Protein

- The proteins that elicit reactions in celiac and non-celiac gluten sensitivity patients that are found in wheat, rye, and barley.
- The prolamin fractions that are problematic to celiac patients are:
  - Glutenins
  - Gliadins
  - Hordein
  - Secalin



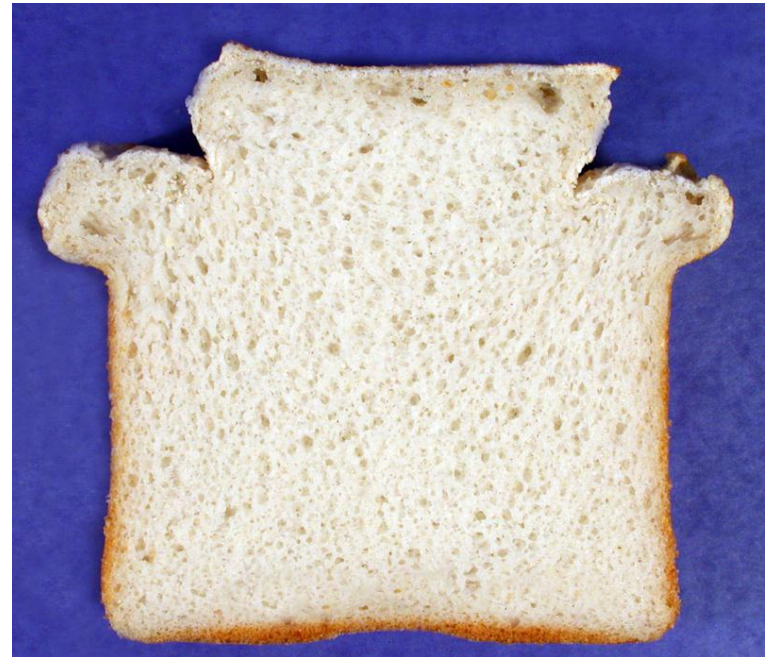
# White Sorghum

- White sorghum is a naturally gluten free grain and is excellent for use gluten free products.
- Whole grain white sorghum flour is ideal because it has a neutral flavor, white color, and it is high in dietary fiber.



# Uses for White Sorghum

- White sorghum can be used in a wide variety of gluten free products.
  - Cakes
  - Breads
  - Muffins
  - Flatbreads
  - Tortillas
  - Noodles
  - Snack Foods





# White Sorghum in Bread

- White sorghum flour should be used in combination with starches like tapioca or potato starch.
- If you are wanting to create a gluten free bread using sorghum a hydrocolloid such as guar gum or xanthan gum will be needed to replace the functional properties of glutenin and gliadin in dough.



# White Sorghum in Bread

Whole grain white sorghum can be used up to 80% of the flour blend of gluten free sandwich breads, however at higher levels of substitution specific volume will be lower and crumb air cells will be smaller.





# White Sorghum Noodles



# Sorghum in Sweetbreads



Photos thanks to Enjoy Life  
Foods LLC



# In Conclusion

- Celiac disease and gluten sensitivities can only be treated by a diet free of wheat, rye, and barley.
- White sorghum is ideal for use in a wide variety of gluten free products.
- Increased availability of high quality white sorghum has made it more affordable to create high quality gluten free products.

