



CLEAN LABEL CONFERENCE

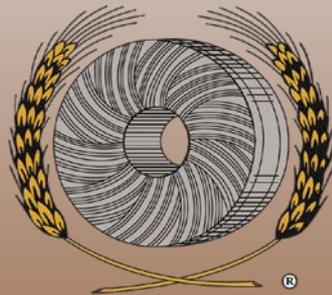
Sophisticated Solutions for Simplified Labels

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2013 Technology Snapshot Presentation

**Save Dough Using SafeExtend
By: Grain Millers**

Save Dough using SafeExtend



GRAIN MILLERS
Safe*flax*TM

Clean Label Defined

- The replacement of ingredients that would be foreign to most consumers, with every day products that would ordinarily be found in the kitchen cupboard or grocery store and that most consumers would be familiar with.

Functional and Nutritional Components of Flaxseed

- Highest plant source of ALA – the parent omega 3 fatty acid
- Phospholipids
- Dietary Fiber (soluble and insoluble), gums and other hydrocolloids
- Complex matrix of many other functional and bioactive compounds such as proteins, phenolic compounds, phytates etc.

Flaxseed Gum

- Natural Blend of hydrocolloids found in the flaxseed hull.
- Flaxseed polysaccharide gum has been characterized by many research workers but can be roughly grouped as follows:
 - Low molecular weight pectin like compounds, mid molecular weight compounds like guar and agar, and higher molecular weight components similar to xanthan.
- Presents a unique composition that leads to a high degree of versatility over a wide range of conditions and applications.
- Different cultivars of flaxseed do yield polysaccharide extracts of unique composition. At Grain Millers we produce SafeExtend from a golden variety that exhibits stronger rheological properties in aqueous solutions than those from brown seeded varieties.



Use of Flaxseed Polysaccharides in Food and Beverages

- Cultivated as long ago as 5000 BC
- Nikkila (1965-66) patented the use of flaxseed gum as an egg white substitute in bakery products and ice cream.
- Schormuller and Winter (1958) incorporated flaxseed gum in fruit drinks.
- Garden-Robinson (1993) added flaxseed gum to hard red spring wheat flour used in making breads. The gum showed significant effects on dough rheology and loaf volume, subjective characteristics, and shelf life of bread.
- So, what's new?

SafeExtend

a SafeFlax ingredient from GrainMillers

SafeExtend is a **golden flaxseed ingredient** milled specifically to enhance it's functional properties. While it contains all of the ALA Omega 3 of our other flaxseed ingredients, (approximately 20% of the total weight) the main focus of SafeExtend is on it's fiber, both soluble and insoluble. This ingredient is able to absorb and bind water, increasing dough yield and improving dough handling properties, making it an excellent choice for use in breads, tortillas, batters, and flour based mixes such as cake mixes.



SafeExtend at 3% inclusion rate

Initial testing on using SafeExtend in a white pan bread was done replacing 50% of shortening with 3% SafeExtend. The results were as follows:

Higher absorption of water. At 3% inclusion, absorption went from 67% to 70%.

Mixing time reduced from 6.5 min to 5 min.

Dough was more “rubbery” which offsets the stickiness often found with increased water absorption, which would make it easier to handle in a automated commercial equipment.

This higher inclusion rate had some negative impacts on parameters such as softness and loaf height, however it still resulted in a very acceptable loaf.

SafeExtend Inclusion at 0.3%

SafeExtend can successfully be used as a partial (50%) replacement for conventional shortenings in a white pan bread formula.

Inclusion rates of 0.3% show excellent results including the following:

- Increased absorption (higher dough yield)
- Improved dough handling properties
- Excellent retention of moisture
- Reduced cost of ingredients

Summary of Baking Treatments at 0.3% Inclusion Rate

Control	Shortening incorporated at 3%, absorption at 67%
Treatment 1	Shortening was reduced by 50%, absorption was increased by 7% (total absorption was at 74% and SafeExtend was pre-hydrated and added at the level of 0.3%

Summary of Results at 0.3% Inclusion rate

Parameter	Control	Treatment 1	Extended proofing time
Absorption, %	67	74	74
Mixing Time, min	6.8	9.9	9.9
Proof Time, min	55	55	65
Proof Height, mm	105	115	93
Bake Height, mm	147	155	134

Further Scoring

- Higher amounts of water impacted crumb structure slightly , affecting cell diameter and cell wall thickness, but still very acceptable.
- Both internal and external color were slightly darker but still would pass as white pan bread.
- Dough handling properties mimic those with the full amount of shortening.
- Internal softness is identical on all three treatments.
- Bake time did not change

Value Proposition

Benefits of Using SafeExtend at a rate of 0.3% :

- . Reduction in total ingredient cost by \$0.036 per kg of flour
- . Absorption rate increased by up to 7% resulting in higher yield.
- . Reduction in total fat by approximately 50%

SafeExtend as a Replacement for Guar Gum in Tortillas

SafeExtend can successfully be used as a 100% replacement for Guar Gum in Tortillas

Inclusion rate of 0.7% shows excellent results including the following:

- Very good dough handling properties
- Comparable or better extensibility than with Guar Gum
- Equivalent retention of moisture over a 14 day period.

Summary of Baking Treatments for Tortillas

Control	Standardized (no hydrocolloid incorporated)
Treatment 1	Hydrocolloid was incorporated at 0.5%
Treatment 2	Hydrocolloid was replaced with SafeExtend, pre-hydrated and incorporated at 0.7%
Treatment 3	Hydrocolloid was replaced with SafeExtend, not pre-hydrated and incorporated at 0.7%

Summary of Results for tortillas

- Absorption, Weight, diameter and thickness were virtually identical in all four treatments.
- External scoring such as toasted spots, overall eye appeal, translucency and puffing were similar.
- Rollability was similar throughout the 14 day period, although on day 7 treatment 1 was slightly better.
- Treatment 2 produced tortillas that were softer.

Value Proposition

- Clean Label. Replace “Guar Gum” with “Milled Flaxseed” on the ingredient statement.
- Reduce cost of ingredients by up to \$0.08 per kg of flour used.
- Produce a better, more extensible tortilla.

Egg Replacement in Oatmeal Cookies

- Replace 1 egg with 16 gm SafeExtend hydrated for 2 min in 2 tbps warm water.



- » Cookie on the left was control.
- » Cookie on the right contained SafeExtend in place of 1 egg.
- » Cookie on the right maintained higher volume after cooling.

Shortening Replacement in Cupcakes

- Replace 50% shortening with 2% SafeExtend in cupcakes.
 - Treatment 1 is control, treatment 2 has 50% less shortening, treatment 3 has 50% less shortening with 2% hydrated SafeExtend.
- Treatment 2 slightly decreased specific volume compared to the control. However, Treatment 3 produced the cupcake of the specific volume that was identical to the control and thus demonstrated an improving effect.



SafeExtend™ as a partial replacement for shortening demonstrated a beneficial effect on cupcake crumb structure resulting in an open crumb that was very similar to the control. (shown on the right)

The cupcake with a reduced shortening amount had more compact crumb structure which is less desirable for this product.(center)

Further testing demonstrates a 20% reduction of shortening replaced with 2% SafeExtend yields the best results.



SafeExtend

- Replacement for up to 50% of shortening.
- 100% replacement for guar gum
- Fantastic nutritional addition to the ingredient listing.
- Creates a cleaner label by including “milled flaxseed” in your ingredient list.
- Saves you money and increases your profit.

Thank you!

Thanks for attending today. Please stop by our table top for further information on how Grain Millers SafeFlax can help you with your Clean Label development.

Linda Pizzey Director of Sales - Flax

