

*Driving Innovation in Tortillas  
through “Better for You” Offerings*

**BayState Milling**  
A Trusted Family of Ingredients.





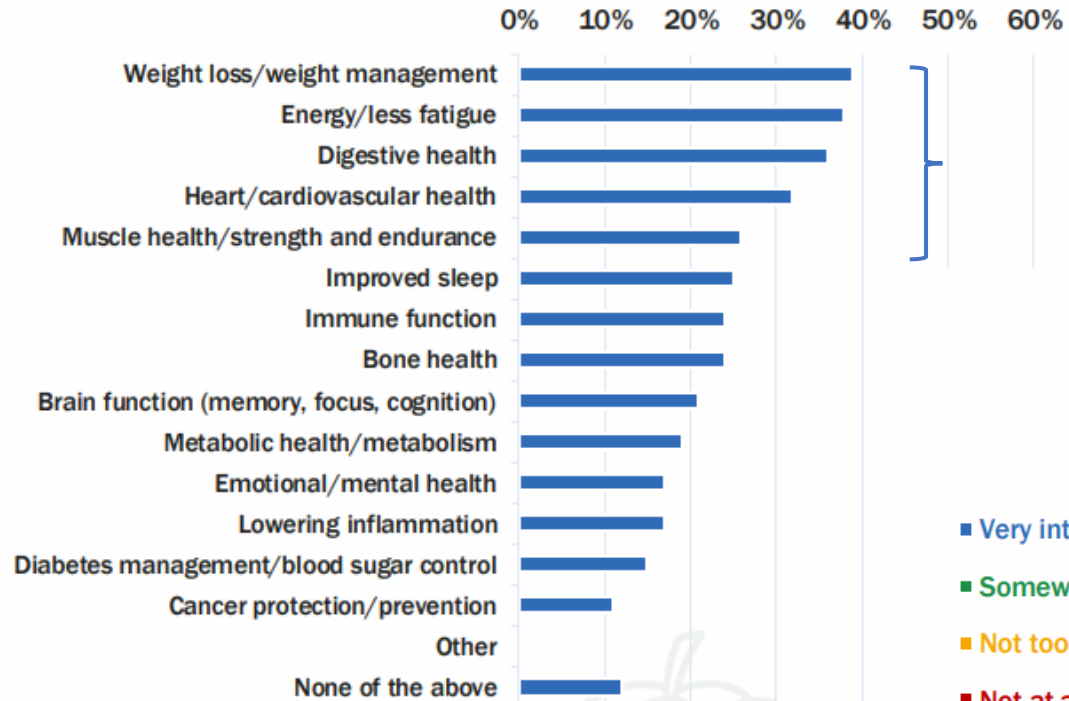
# Bay State Milling knows Tortillas



Supplying Flours, Whole Grains & Seeds since 1899

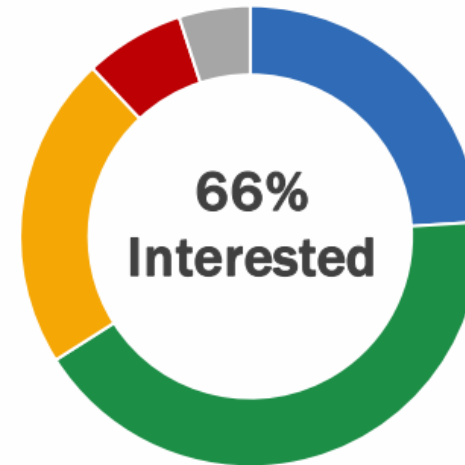
# What Benefits are Consumers Seeking?

## Health Benefits Sought from Food



## Interest In Learning About the Role that Foods and Nutrients Play In Immune Health

- Very interested
- Somewhat interested
- Not too interested
- Not at all interested
- Not sure



**71%** of consumers with an income of \$35k+ say they are very/somewhat interested (vs. 55% of consumers with an income of less than \$35k)

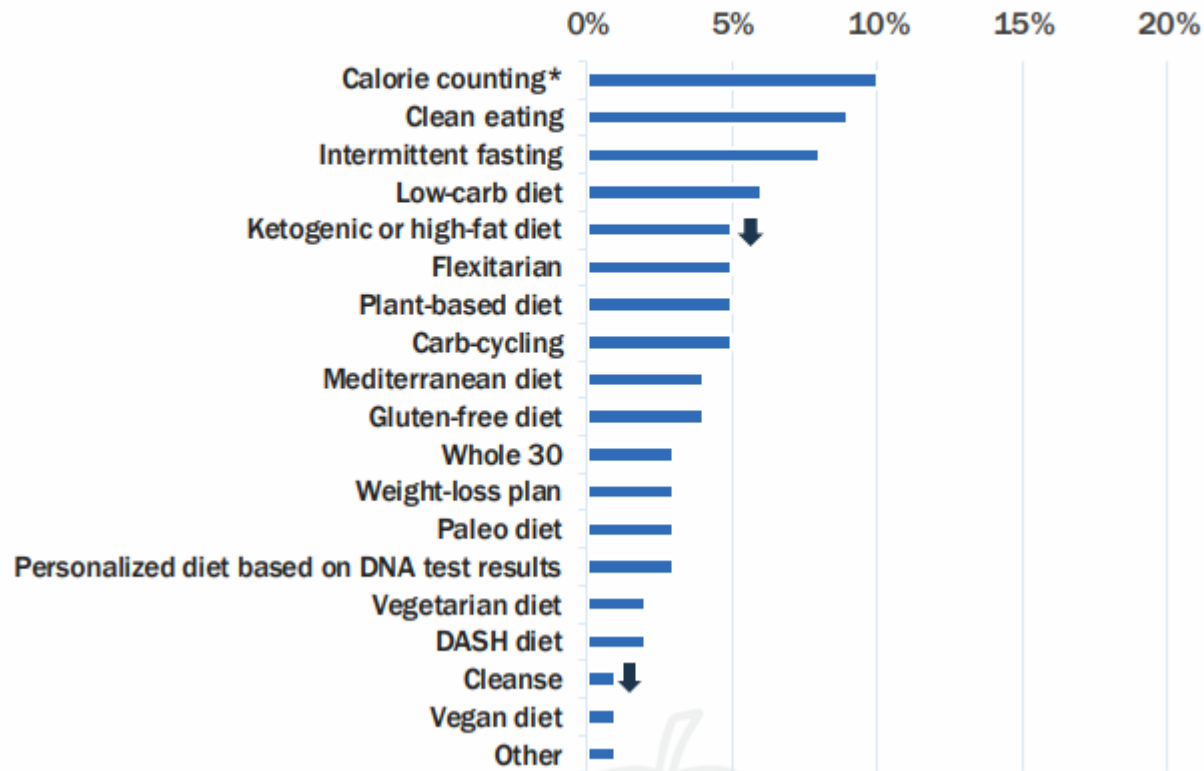
**74%** of parents with children under 18 say that they are very/somewhat interested (vs. 64% of those without children under 18)

**71%** of people who grocery shop online at least once a month say that they are very/somewhat interested (vs. 60% of people who never grocery shop online)

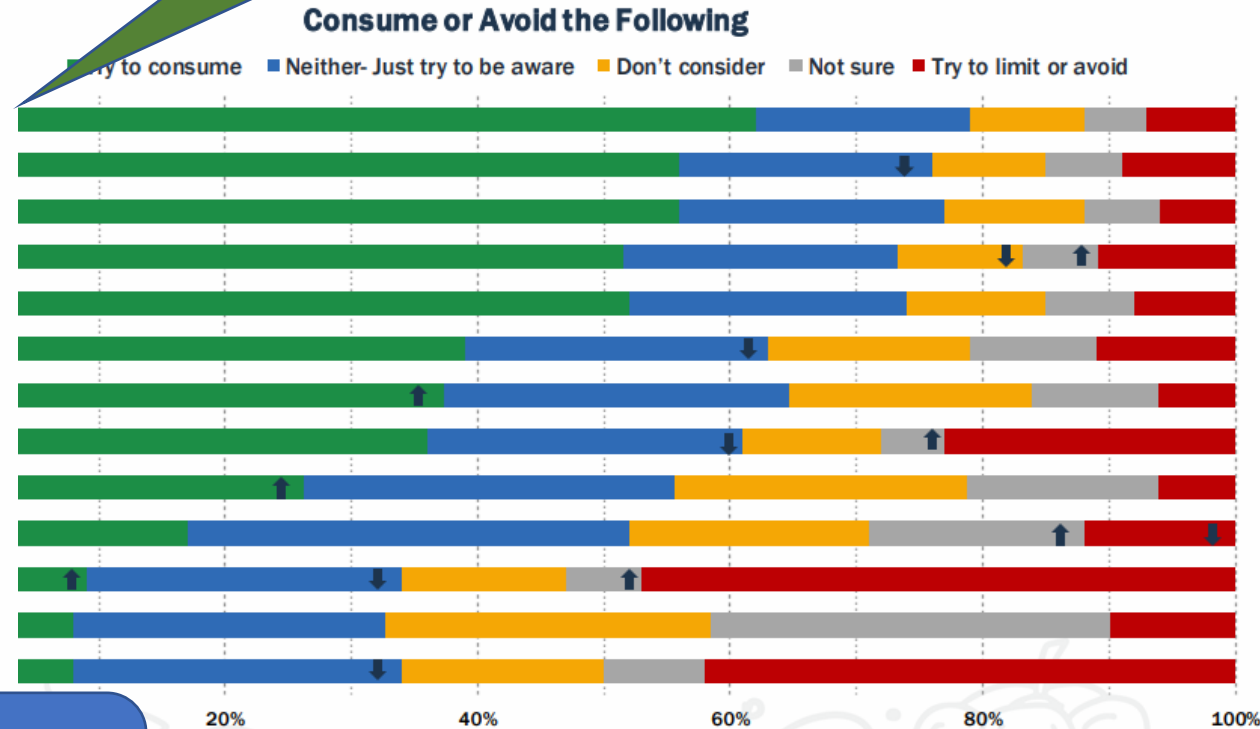


# How are they going about it?

40% of consumers followed a specific diet last year:

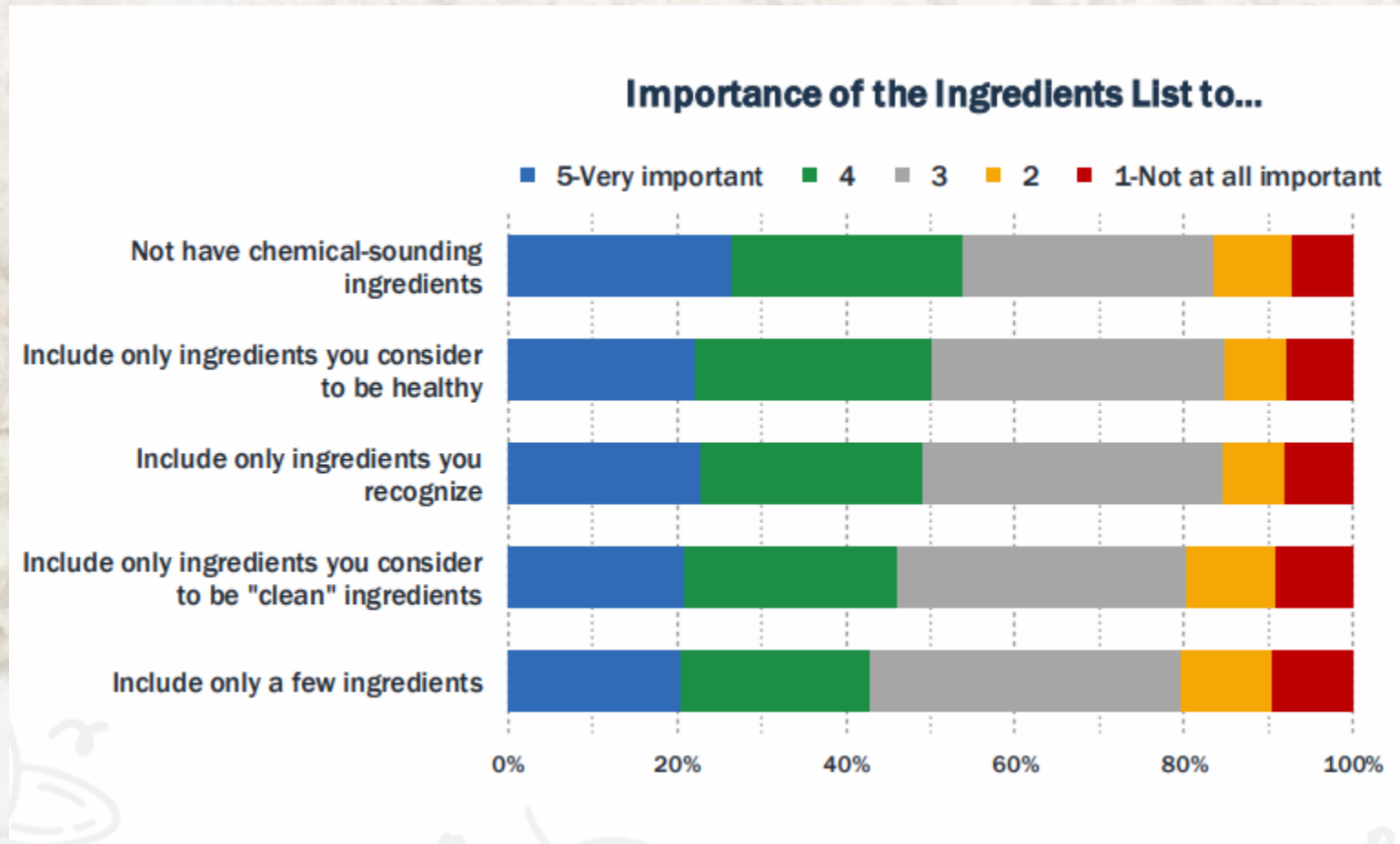


One in 4 consumers say they are eating more protein from plants vs. a year ago!

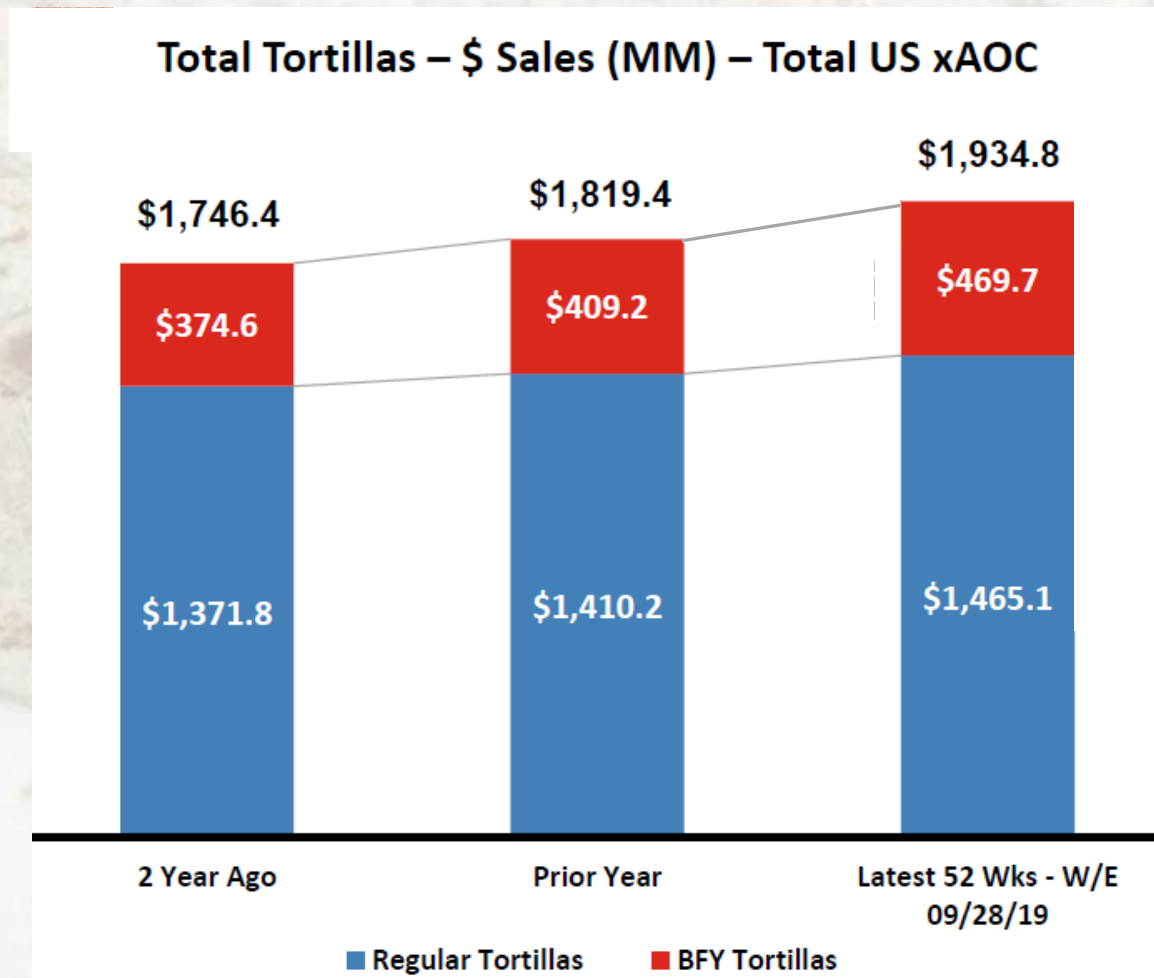


Low carb and “keto” diets have grown in popularity. These diets emphasize protein, fiber and fat as a way to efficiently burn fat and promote weight loss.

# They want all that “clean” & “simple”



# “Better for You” is where the growth is!



The **Better For You (BFY)** segment has experienced disproportionate growth within the entire tortilla market – now nearly 25% of total category

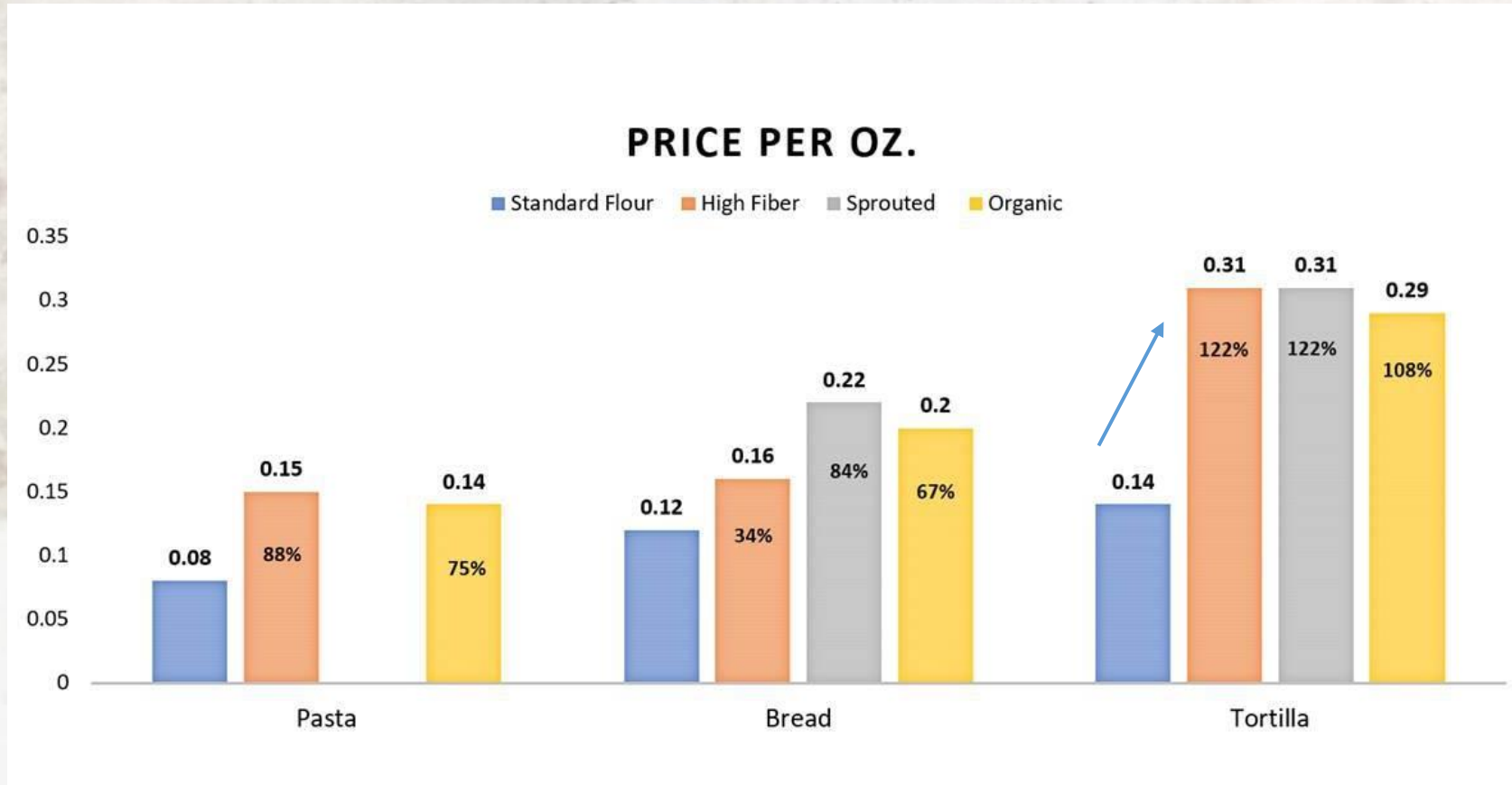
BFY subsegments are still shaking out (5-year CAGRs), ordered by value:

- **Low Carb: +16.6%**
- Whole Wheat: -8.9%
- No Preservative: +12.3%
- **Gluten Free: +27.2%**
- Organic: +33.3%
- No/Low Fat: -15.1%
- All Other: -7.0%



# “Better for You” is where the Profit is!

*Due to their purchase frequency and relatively high register ring, tortillas represent a value-enhancing opportunity for branded manufacturers and retailers alike.*



Source: Bay State Milling proprietary research (2b updated)



# Low Carb Lingo

- Low Carb: Lower amount of carbohydrates per serving than a standard food-not defined by FDA.
  - Can't make label claim except factual grams of carbs per serving
- Low “Net” Carb: Fiber and sugar alcohols are subtracted from total carbohydrates.
  - Can't make label claim except factual grams of carbs per serving
  - Can't add a line to nutrition facts panel
  - Be realistic-don't go for zero!
- “Keto” or “Atkins” friendly
  - Can be consumed as part of a low carb/high protein diet (~<5g/serving)



# How to formulate a Low Carb Tortilla?



**Fiber**

**Fat**

**Protein**

# Formulating with Fiber

*Fiber is technically a carbohydrate but is not digested and does not contribute to a glycemic response, therefore it does not count towards total carbohydrates in a formulation.*

## Challenges


- Water absorption management
- Gritty mouthfeel
- Dry or brittle texture

## Opportunities

- Reduce total calories
- Make a fiber label claim
- Make a prebiotic benefit claim



# Frequent Fibers for Tortillas

Fiber Type	Source	Content	Labeling/Claim	Sensory	Benefits
Oat Fiber	<ul style="list-style-type: none"> <li>Oat Hulls</li> </ul>	<ul style="list-style-type: none"> <li>85% TDF</li> </ul>	<ul style="list-style-type: none"> <li>Oat Fiber</li> </ul>	<ul style="list-style-type: none"> <li>Neutral</li> </ul>	<ul style="list-style-type: none"> <li>Clean label</li> <li>Gluten Free</li> <li>Process Tolerant</li> </ul>
Modified Wheat Starch	<ul style="list-style-type: none"> <li>Wheat flour or starch</li> </ul>	<ul style="list-style-type: none"> <li>85% TDF</li> </ul>	<ul style="list-style-type: none"> <li>Modified wheat starch</li> </ul>	<ul style="list-style-type: none"> <li>Neutral</li> </ul>	<ul style="list-style-type: none"> <li>Process Tolerant</li> <li>Gluten Free*</li> </ul>
High amylose (fiber) wheat flour 	<ul style="list-style-type: none"> <li>Proprietary variety of Wheat</li> </ul>	<ul style="list-style-type: none"> <li>35-40% TDF</li> </ul>	<ul style="list-style-type: none"> <li>Wheat flour</li> <li>High fiber wheat flour</li> </ul>	<ul style="list-style-type: none"> <li>Neutral</li> </ul>	<ul style="list-style-type: none"> <li>Functional flour</li> <li>Whole food or unprocessed</li> <li>Clean label</li> <li>Identity Preserved</li> </ul>

# Formulating with Protein

## Challenges


- Water absorption management
- Flavor
- Shelf Life
- Make a protein claim

## Opportunities

- Further reduce carbs
- Consumers love protein
- Make a protein label claim



# Popular Proteins for Tortillas

Protein Type	Source	Content	Labeling/Claim	Sensory	Benefits
Pea Protein	<ul style="list-style-type: none"> <li>Yellow Peas</li> </ul>	<ul style="list-style-type: none"> <li>70-90%</li> </ul>	<ul style="list-style-type: none"> <li>Pea Protein or Pea Protein Isolate</li> </ul>	<ul style="list-style-type: none"> <li>Pale yellow color, pea flavor</li> </ul>	<ul style="list-style-type: none"> <li>No carb contribution</li> <li>Grain &amp; Gluten free</li> </ul>
Chickpea Flour	<ul style="list-style-type: none"> <li>Whole or dehulled chickpeas</li> </ul>	<ul style="list-style-type: none"> <li>25-30%</li> </ul>	<ul style="list-style-type: none"> <li>Chickpea or Garbanzo flour</li> </ul>	<ul style="list-style-type: none"> <li>Pale yellow color, chickpea flavor</li> </ul>	<ul style="list-style-type: none"> <li>Whole food flour</li> <li>Grain &amp; Gluten free</li> </ul>
High Protein Oat Flour 	<ul style="list-style-type: none"> <li>Proprietary variety of Naked (hull-less) oats</li> </ul>	<ul style="list-style-type: none"> <li>20%</li> </ul>	<ul style="list-style-type: none"> <li>Oat flour</li> </ul>	<ul style="list-style-type: none"> <li>Tan color, toasted oat flavor</li> </ul>	<ul style="list-style-type: none"> <li>Whole food flour</li> <li>Heart health claim</li> <li>50% fewer carbon emissions vs. oats</li> <li>&lt; 5ppm Gluten free</li> <li>Identity Preserved</li> </ul>

# Protein Claims

Grains and Pulses have complementary amino acids and higher quality together

- Protein content claims are 10-20% of the daily value of 50g/serving
  - 5-10 grams/serving
- Must be high quality protein
  - PDCAAS=Protein Digestibility Corrected Amino Acid Score
  - Amount of limiting essential amino acid vs. reference protein (egg/whey)
- Amount of crude protein X PDCAAS = actual protein per serving for claims

$$PDCAAS = \frac{\text{mg of limiting amino acid in 1 gram of test protein}}{\text{mg of the same amino acid in 1 gram of reference protein}} * \text{Faecal digestibility}$$



# Size Matters!

- All claims are based on nutrients contained in the RACC or Reference Amount Commonly Consumed
- RACC for Tortillas is 55 grams
  - Actual sizes range from 45 to 70 grams

Product					
Serving Size	50g	45g	45g	57g	45g

# Formulating with Fats

## Pros

- Fat can benefit texture, rollability, and shelf life

## Cons

- More than 2X calories than carbs or protein
- Additional opportunity for rancidity
- Too much may preclude health claims

*Consider using ground oilseeds as a source of fat (and flavor, texture and protein) to enhance your Better for You Tortillas!*



# Better for You Watch Outs

- ✓ Manage competition for water between fiber and protein
- ✓ Keep “clean” in mind when specifying ingredients
- ✓ Remember calories still count, even in Keto
- ✓ Remember size matters so formulate around a RACC
- ✓ Zero net carbs doesn't benefit anyone



# Conclusions

- There is a growing and changing market for BFY tortillas
- These products are taking share of traditional tortilla's-jump in or lose out!
- Determine the consumer you want to please most and formulate against their needs
- Strike a balance around carbs, protein and fat to win
- Calories and clean label count
- Consult your ingredient supplier to help you scale the curve





Colleen M. Zammer  
Vice President, R&D  
Bay State Milling  
[czammer@bsm.com](mailto:czammer@bsm.com)  
815-793-0584 (cell)  
[www.baystatemilling.com](http://www.baystatemilling.com)

Q&A

Appendix-HealthSense Flour



# Breakthrough Fiber Source, Directly From the Farm!



A proprietary variety of specialty wheat unique to Bay State Milling that offers distinctive value for innovative brands

## HIGH FIBER WHEAT FLOUR

Delivers up to **10x the amount of fiber** in a finished product compared to traditional wheat flour

## PREBIOTIC POWER

Naturally occurring resistant starch fiber to **nourish gut health**

## CLEAN LABEL & WHOLE FOOD

Labels simply as wheat, allowing a reduction or replacement of fiber additives

## SENSORY & FUNCTIONALITY

Same **great taste, texture** and performance of white refined flour with nutritional profile of whole wheat flour





# Product Concept: BFY Tortillas

Capitalize on the \$1.9bn tortilla market with a differentiated wheat-based version

6x the **FIBER** of a traditional tortilla

Promote same **GREAT TASTE & FLEXIBLE TEXTURE**

**PREBIOTIC FIBER** Supports gut health & immunity



**IMPROVED ROLLABILITY**  
based on internal BSM evaluations

**CLEAN LABEL**  
HealthSense labels as "wheat flour"



## TRADITIONAL

	50g	% daily value
Calories	120	
Total Carbohydrate	21g	8%
Dietary Fiber	1g	4%
Protein	3g	
Net Carbs	20g	



## IMPROVED NUTRITIONALS \*

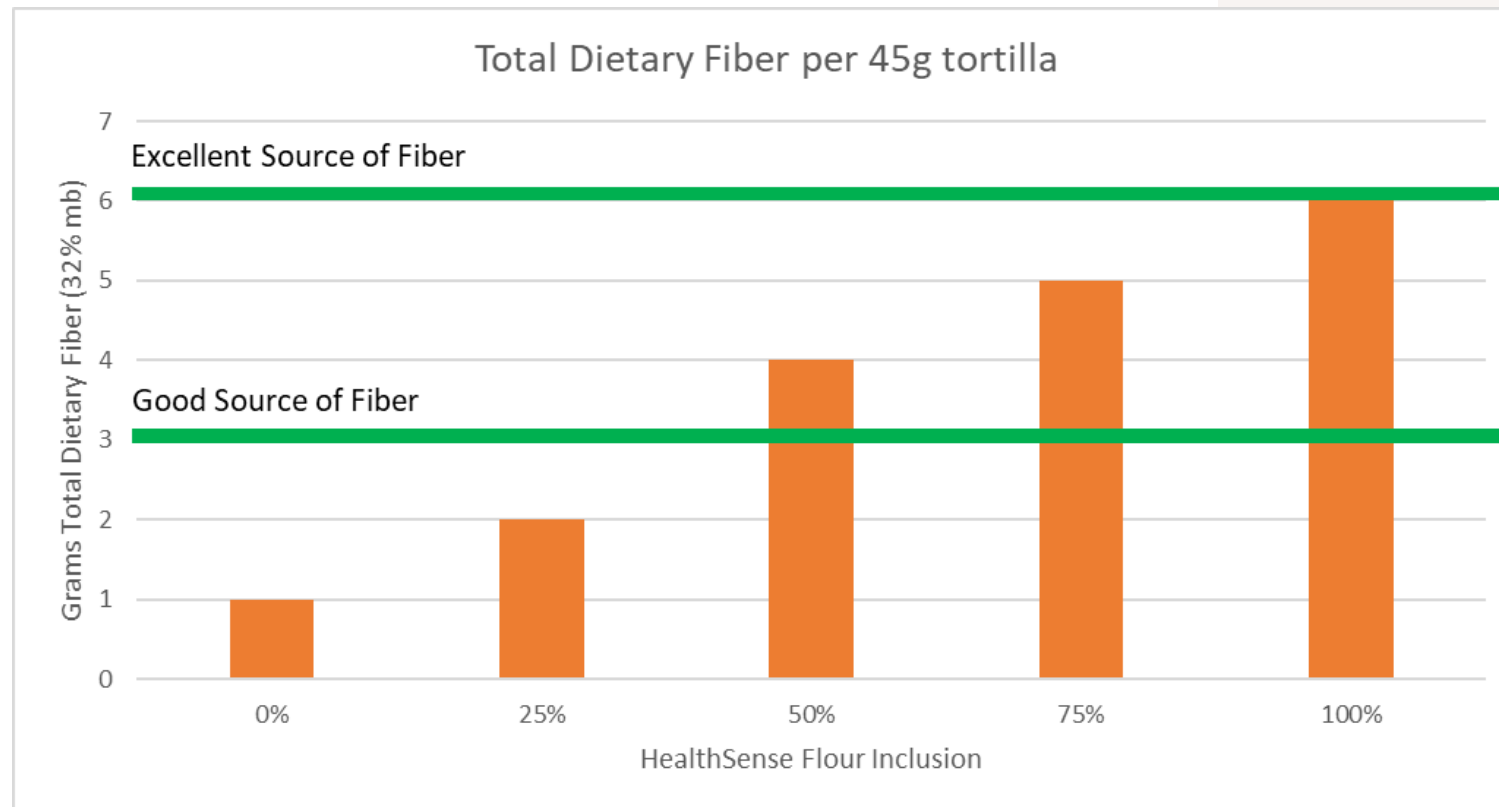
	50g	% daily value
Calories	100	
Total Carbohydrate	20g	8%
Dietary Fiber	6g	43%
Protein	4g	
Net Carbs	14g	

[\*] Based on 100% HealthSense



# Nutritional Advantages

Substituting HealthSense Flour for traditional wheat flour in a standard tortilla formula can yield 2-6X more dietary fiber than a traditional flour tortilla, equating to either a “Good Source” (3g/svg) or “Excellent Source of Fiber” (6g/svg) claim.



# Processing Advantages

**Traditional wheat flour delivers optimal functionality when used in tortilla manufacturing but does not deliver adequate amounts of dietary fiber in the finished product.**

In addition to delivering more dietary fiber, HealthSense flour also provides **enhanced functionality**:

- Dough-making characteristics
  - Improves dough **extensibility** (i.e., minimizes dough springback)
  - Improves dough **machinability**
  - Optimal **water absorption** to avoid sticking to the tortilla press
- Finished product characteristics
  - Enhanced **rollability** and **foldability** over shelf life
  - No differences in **color** compared to a traditional tortilla
  - No differences in **flavor** or overall eating quality compared to a traditional tortilla
- Better **cost-in-use**
  - Typical isolated fiber ingredients cost more than \$2/lb, and are not compatible with **clean label**



Appendix-SowNaked Oats

# A Unique Oat Offers Differentiation In Various Applications

**40%** MORE  
PROTEIN  
than traditional oat

**50%** FEWER CARBON  
EMISSIONS  
than traditional oat

- ✓ Whole food protein source
- ✓ Free of Top 8 allergens
- ✓ Available in Sprouted
- ✓ Unique flavor profile, texture
- ✓ Purity Protocol gluten-free

**Breakfast foods**  
(granola, oatmeal)

**Snacks and convenience**  
(bars, clusters)

**Baked goods**  
(inclusions, flours)

**Dairy alternatives**  
(milks, yogurts, frozen desserts)





# What Are Naked Oats?



Naked Oats, or *Avena Nuda*, are unique oat cultivars that shed themselves of their hulls during harvest.



Grown from conventionally bred oat varieties that are 40% higher in protein (20% dwb) than standard oats.



Grown in a closed system and identity preserved to each individual farm, then minimally processed.



**30% LESS MASS** (hull)  
than traditional oat



Naked Oats reduce farm storage needs, transportation & fuel, and provide substantially higher returns to growers.



Because Naked Oats are harvested without the hull, energy-intensive steps of hulling and steaming are eliminated, equating to 48% fewer carbon emissions.



## BAY STATE OAT GROWING REGIONS

Canada



United States

# CO2e Emissions

## SowNaked vs. Hulled Oats





Because Naked Oats are harvested without the hull, energy-intensive steps of hulling and steaming are eliminated, equating to 48% fewer carbon emissions.




### SowNaked Oats



### Hulled Oats

			SowNaked Oats	Hulled Oats
<b>TRANSPORTATION</b>	Miles Traveled		<b>83,000 miles</b>	<b>135,000 miles</b>
	CO2e		<b>232,000 lbs</b>	<b>377,000 lbs</b>
<b>PROCESSING</b>	Steam		<b>0 miles</b>	<b>618,000 miles</b>
	CO2e		<b>0 lbs</b>	<b>67,000 lbs</b>

 SowNaked Oats  
CO2e Reduction

**= 212,000 LBS**  
(per 5,000 acres)