Alternative Flours For the Tortilla Industry

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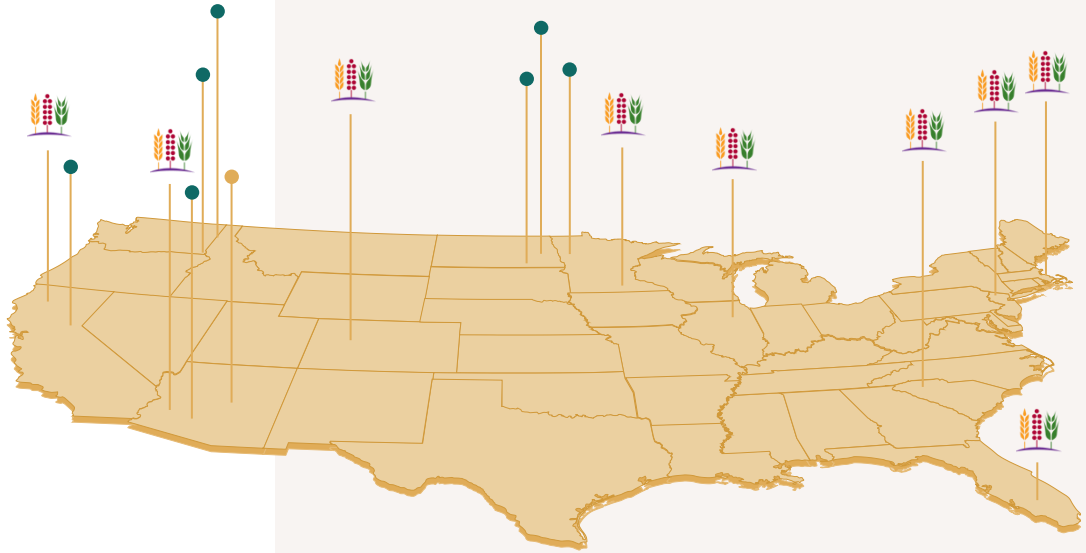
Bay State Milling

Mindfulness Moment

Company Overview: Bay State Milling

- Bay State Milling combines a 120-year family-owned heritage in wheat milling with the latest advancements in plant-based nutrition
- We exist to provide food ingredients that promote the growth of healthful and affordable food choices
- Today, BSM offers an unrivaled portfolio of traditional grains, global specialty supply chains, and unique varietal solutions that equip our customers to win

WITH HEADQUARTERS PROUDLY LOCATED IN BOSTON, BSM OPERATES A BROAD NETWORK OF ASSETS STRATEGICALLY LOCATED NEAR SOURCING REGIONS AND MARKET NEEDS



Bay State Facility

HealthSense Farming Location

HealthSense Milling Location

Climate Change: Water challenges

- Las Vegas- July 29th Declares Emergency as less than 50 days of clean water remain.
- Colorado river water cuts; Arizona 21%, Nevada 8%, Mexico 7%
- California- Lowest acres planted to rice since 1942

World Rivers Running Dry

- Colorado- USA
- Indus River- Pakistan
- Amu Darya- Central Asia
- Syr Darya- Uzbekistan
- Rio Grande- USA
- Yellow- China
- Yangtze- China
- Teesta- India
- Murray- Australia

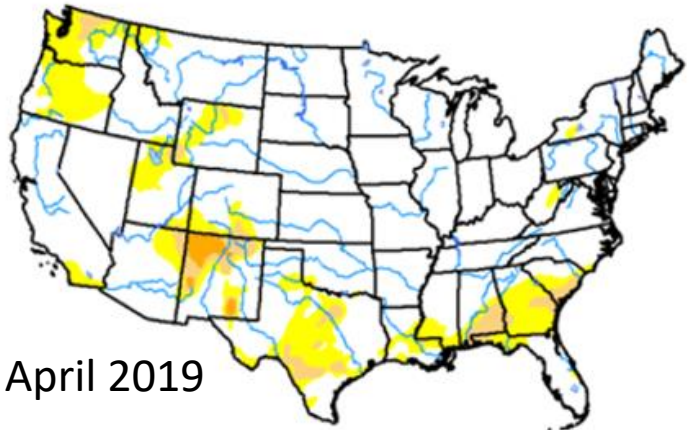
Sources: [1] " National Geographichttps://www.nationalgeographic.com/environment/article/rivers-run-dry

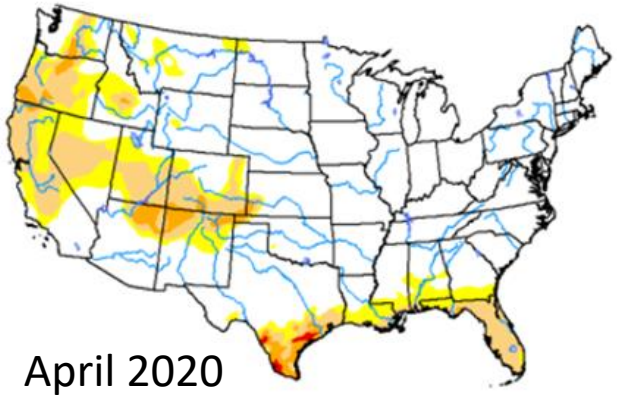
Persistent Drought:

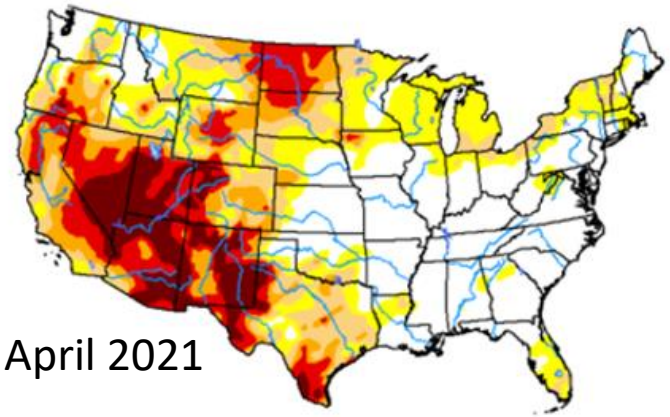
Crop supply yield shock

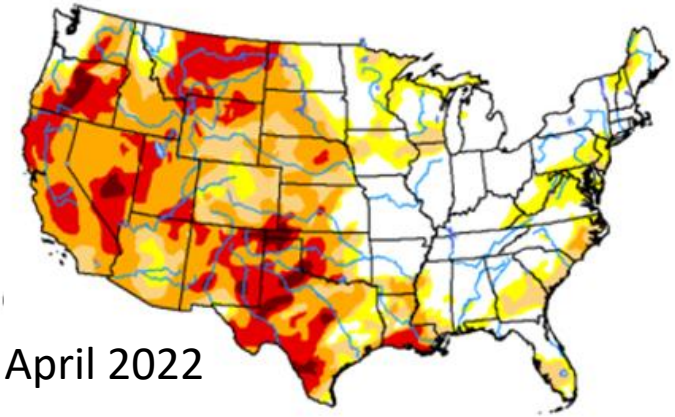
Year over year Persistent Drought stresses agricultural land. Conventual Wheat Acres continue to be stressed reducing carry over stocks. USDA's March 31st Planting estimates indicate lower acres planted to wheat even at record high futures prices. For the first time Soybeans out pace corn for total acreage.

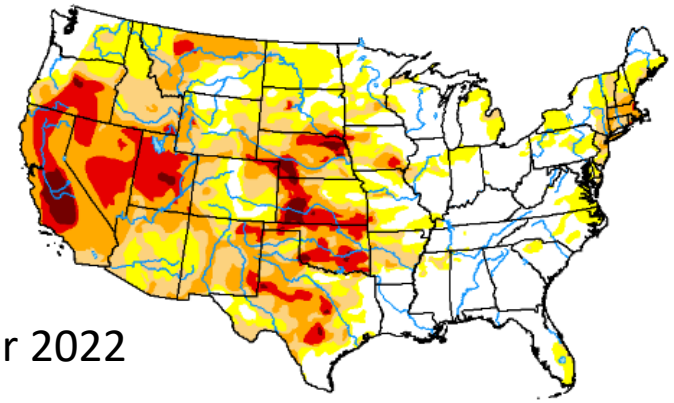
Rising Input costs to Farmers
Fuel
Fertilizer


April 2019


April 2020


April 2021

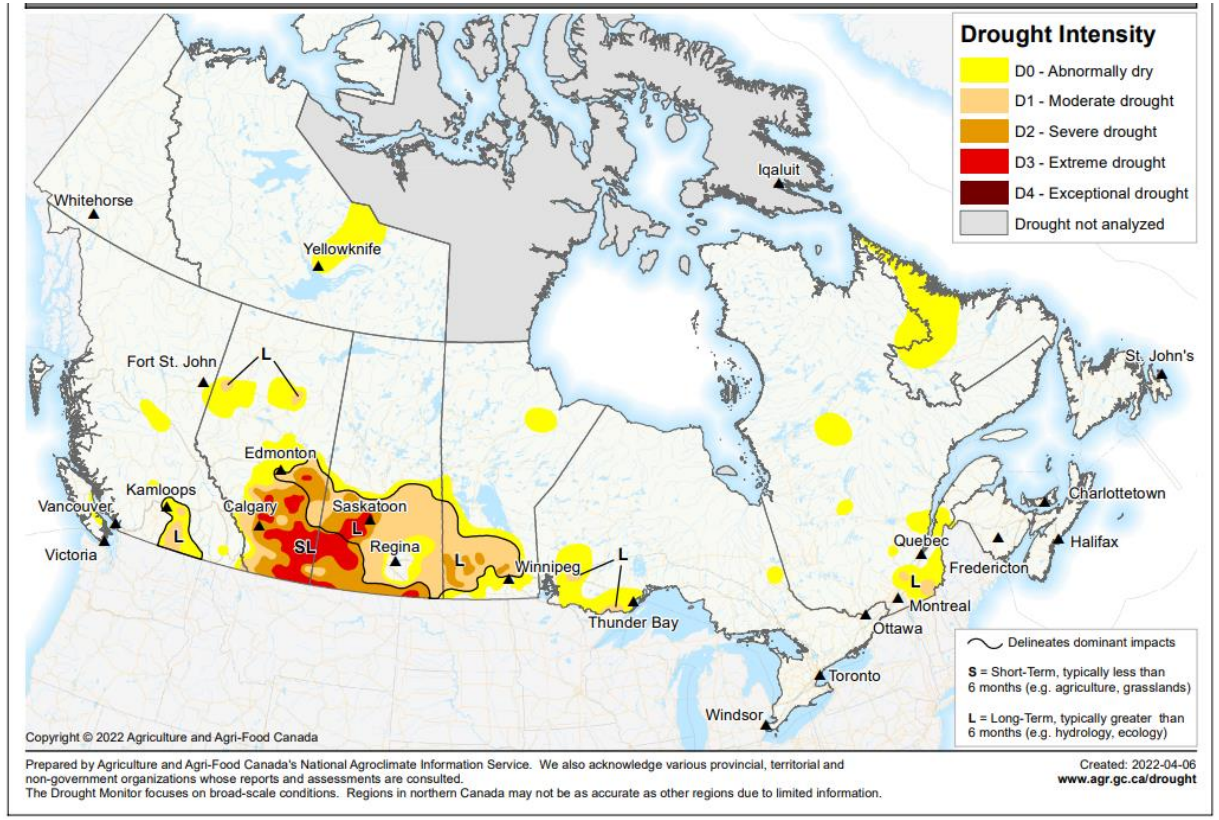

April 2022


September 2022

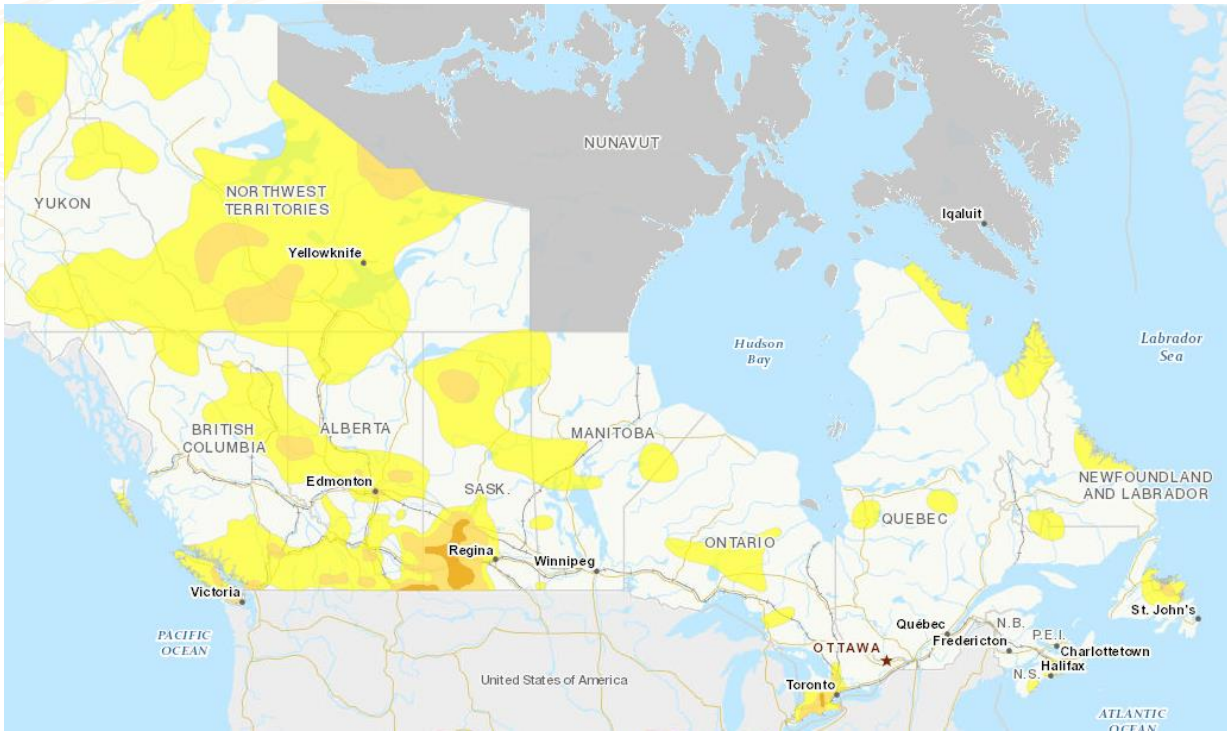
Sources: [1] " US Drought Monitor the National Drought Mitigation Center, University of Nebraska-Lincoln

Persistent Drought:
Canadian Prairies

As of March 31st, 2022



Current as of September 18th



Sources: [1] " Agriculture and Agri-Food Canada https://agriculture.canada.ca/ April 18,2022

Wheat Futures: Geopolitical shocks

Geopolitical events (Russia's invasion of Ukraine) Both major Wheat Exporters (close to 30% of global supply)

- Inflation
- Climate change
- Rising Input costs
- UN FAO Food price Index up 12.6% February 2022

Wheat Futures:

December Wheat Futures on CBOT reach highs not seen since the 2008 Finical Crisis. 20-year view

Have we passed the fears of Recession?

- How Will consumers respond to rising inflation coming out of a Pandemic?
- Will we see Away-From-Home traffic returning and sustaining at pre-pandemic levels?
- What Can Tortilla Manufactures do to respond to rapidly changing markets?

Recessions and Consumer diet trends:
National Bureau of Economic research

1917
First Book released on counting Calories

1950's
"Cabbage soup"
Mediterranean Diet

1960's
Jake Lalanne
Juicing/ high protein "egg whites"

1970's
Low Fat Diet
Slim Fast

1980's
Frozen Food Meals
Jenny Craig

1990's
Low Carb
Atkins Diet

2000's
Detox Diet
South Beach Diet

2010's
Keto Diet
Yogurt craze (Probiotics)

2020's and beyond
Prebiotics
Immunity
Gut-Health
Microbiome

Common core: Fiber

The Fiber Gap:
95% of People Fall Short!

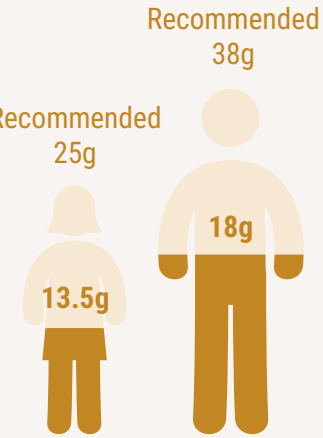
The Gap Defined:

Only **5%** of the population gets enough fiber daily.

And among those who fall short, they miss the mark significantly - **only consuming on average half of the recommended daily intake amount**

(14g/1,000 kcal/day)

95% OF AMERICANS ARE ONLY GETTING 50% OF RECOMMENDED DAILY DOSE OF FIBER



WHY?

- ✕ Poor taste
- ✕ Few options
- ✕ Lack of education

Source: "Closing America's Fiber Intake Gap," American Journal of Lifestyle Medicine, Jan-Feb 2017 US Dietary Guidelines for America, 8th edition

Rising Demand for Fiber:
An Untapped Market

Early-adopting consumers recognize multitude of benefits derived from fiber and taking steps to find products that deliver them

WHY IT MATTERS

Today's US population in midst of the Fiber Gap: **Only 5%** of people get the **recommended daily dose** of fiber [1]

THE WAVE IS COMING

60% of consumers are actively **trying to consume** more fiber [2]

HIGH PURCHASE INTENT

9 in 10 consumers are **interested in buying** products made with High Fiber Flour and replacing flour typically used with a High Fiber version [3]

EMERGING UNDERSTANDING OF FIBER'S HEALTH HALO

Fiber **ranked #1 in perceived healthfulness** (above plant-based protein, whole grain, probiotics, etc.) [2]

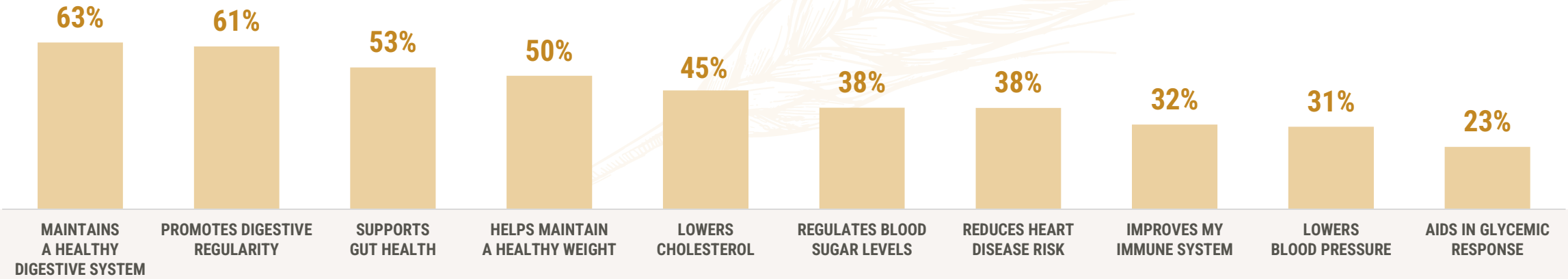
Sources: [1] "Closing America's Fiber Intake Gap," American Journal of Lifestyle Medicine, Jan-Feb 2017 | [2] Foodinsights.org | [3] Bay State Milling proprietary fiber study, n=1,500 consumer panel, 2020

Opportunity:
Broaden Fiber's Benefits

Health Benefits Associated with Dietary Fiber

(N=1,500)

The majority of consumers associate fiber with digestive and gut health. There's an opportunity to communicate about its broader benefits that consumers are starting to associate with dietary fiber.



WHICH OF THE FOLLOWING HEALTH BENEFITS, IF ANY, DO YOU ASSOCIATE WITH DIETARY FIBER?

Source: Bay State Milling proprietary fiber study, consumer panel, 2020, conducted by WAKEFIELD

Breakthrough Fiber Source, Directly From the Farm!

HIGH FIBER WHEAT FLOUR

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

Non-Commodity Wheat

Stable Pricing not impacted by Geopolitical events

CLEAN LABEL & WHOLE FOOD

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

PREBIOTIC POWER

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

Supply chain Assurance

Built in Supply chain redundancy, Varying Geographic growing regions and Storage.

SENSORY & FUNCTIONALITY

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

EXCELLENT SOURCE OF FIBER

USDA ORGANIC

NON GMO Project VERIFIED

Range of Benefits,
Across a Range of Applications

Nutritional Improvements Comparison Using High Amylose Wheat Flour

(assumes an average 50% inclusion level)

	CALORIES (cal/serving)			FIBER (gram/serving)			NET CARBS (gram/serving)		
Application (RACC/serving size)	**100% Traditional Flour**	**50% High Amylose Wheat™ Flour**	**% decrease vs. control**	**100% Traditional Flour**	**50% High Amylose Wheat™ Flour**	**% increase vs. control**	**100% Traditional Flour**	**50% High Amylose Wheat™ Flour**	**% decrease vs. control**
Flour, as is (30g)	110	100	-9%	<1	6	+600%	22	16	-28%
White Bread (50g)	140	120	-14%	1	4	+300%	24	21	-13%
Tortillas (55g)	160	140	-13%	1	4	+300%	26	23	-12%
Pasta (55g)	200	180	-10%	2	7	+250%	39	34	-13%
Macaroni & Cheese (~70g dry mix, makes 1 cup)	250	220	-12%	2	10	+400%	45	37	-18%
Pizza crust (55g)	140	130	-7%	1	4	+300%	24	21	-13%
Pancakes (110g)	310	300	-3%	2	4	+100%	37	35	-5%
Crackers (15g)	80	70	-13%	<1	3	+300%	11	8	-28%

Sprouted Whole Wheat
Excellent Source of Fiber

Economics

Sprouted Wheat flour differentiates Whole wheat beyond commodities and provides premium value to consumers.

Sprouted Wheat Flour

Increased **Enzyme** activity, Longer **stabilities. Shorter proofing**

Flavor/ Texture

The sprouting process increases overall **sweetness, reduced bitterness** and increased perception of **Moistness** leading to **increased consumer acceptability**

Protein/ Enzymes

40% increase in free amino acids Protease enzymes aid in digestion of protein. Increase amylase enzymes creating shorter carbohydrate chains and increase maltose

Ease of use

Sprouted Whole Wheat flour can be utilized at 100% of the flour formulation in tortillas and breads.

EXCELLENT SOURCE OF FIBER

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Pulses & Chickpeas Excellent Source of Fiber & protein

Economics

Chickpeas are a domestic crop and one of the most **economical sources** of plant-based **protein** a **fiber**. A true homerun.

Chickpea Flour

Excellent Source of **Fiber** and crude **Protein**

Sustainability

Excellent for **crop rotations**, Pulses are **nitrogen Fixators**. Can combat rising input costs on fertilizer

Complementary Protein

Chickpeas and Legumes are **high in Lysine** the limiting amino acid in cereal grains. Complexing of protein sources can lead to more complete protein

Ease of use

Chickpea flour both whole and Decorticated are easy to incorporate into traditional tortilla formulas with minor adjustments. Or as the main structure in GF formulations.

Sorghum & Millet
Adaptable to a changing climate

Millet & Sorghum

High in crude protein amongst cereal grains. Ancient grain appeal to consumers

Economics

Sorghum and Millet are complimentary alternative grains that can succussed in arid environments and changing climates.(Southwest) Domestic **Supply chain**

Sustainability

Excellent for **crop rotations**, and **drought resistant**. Non-commodity grain. Good insect and disease resistant. Maintains Soil Health

Ease of use

Millet and Sorghum are great **neutral flavor** GF flours that supplement wheat-based tortillas or the main component of Gluten free tortillas.

2023 Year of the Millet

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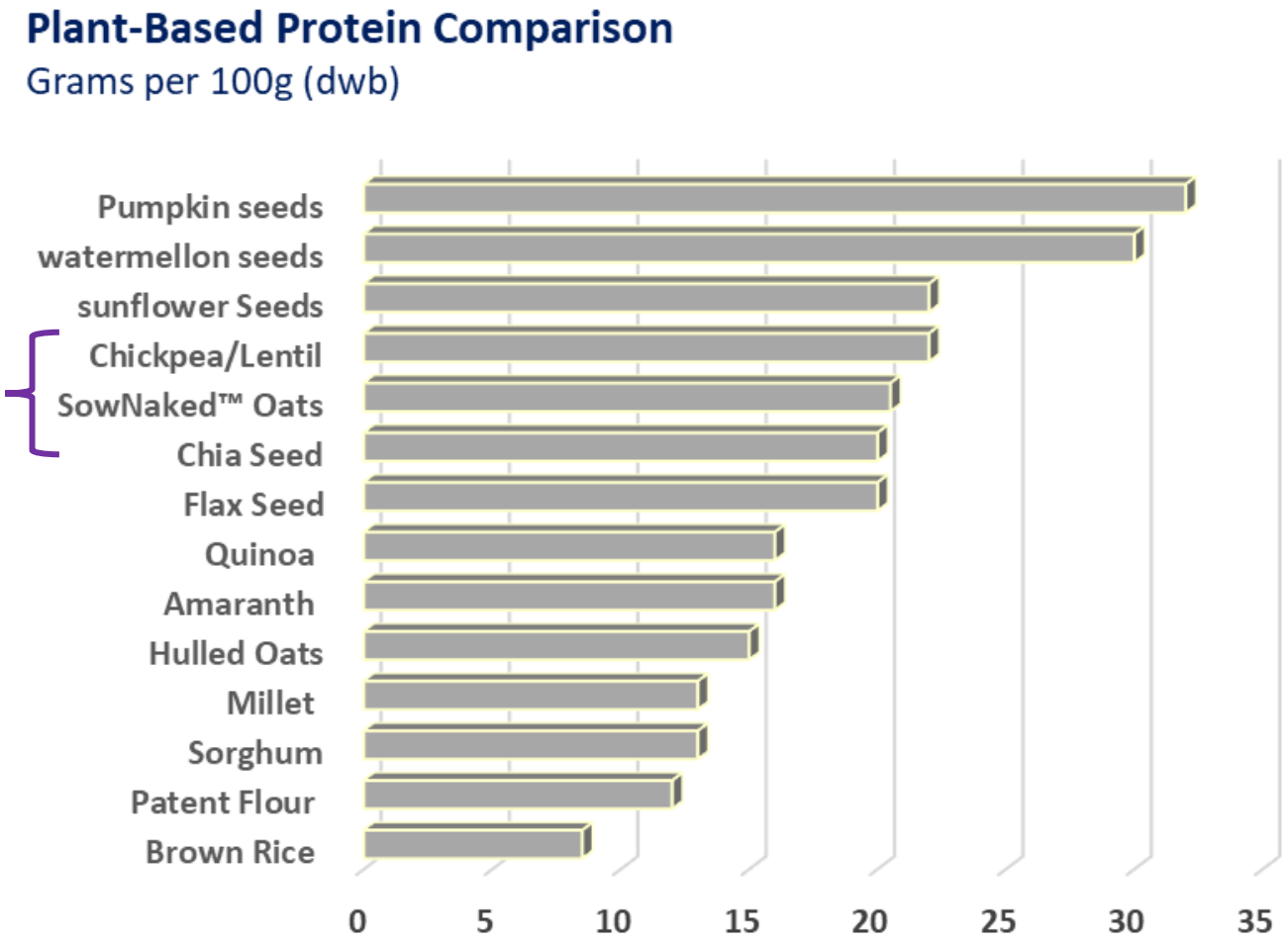
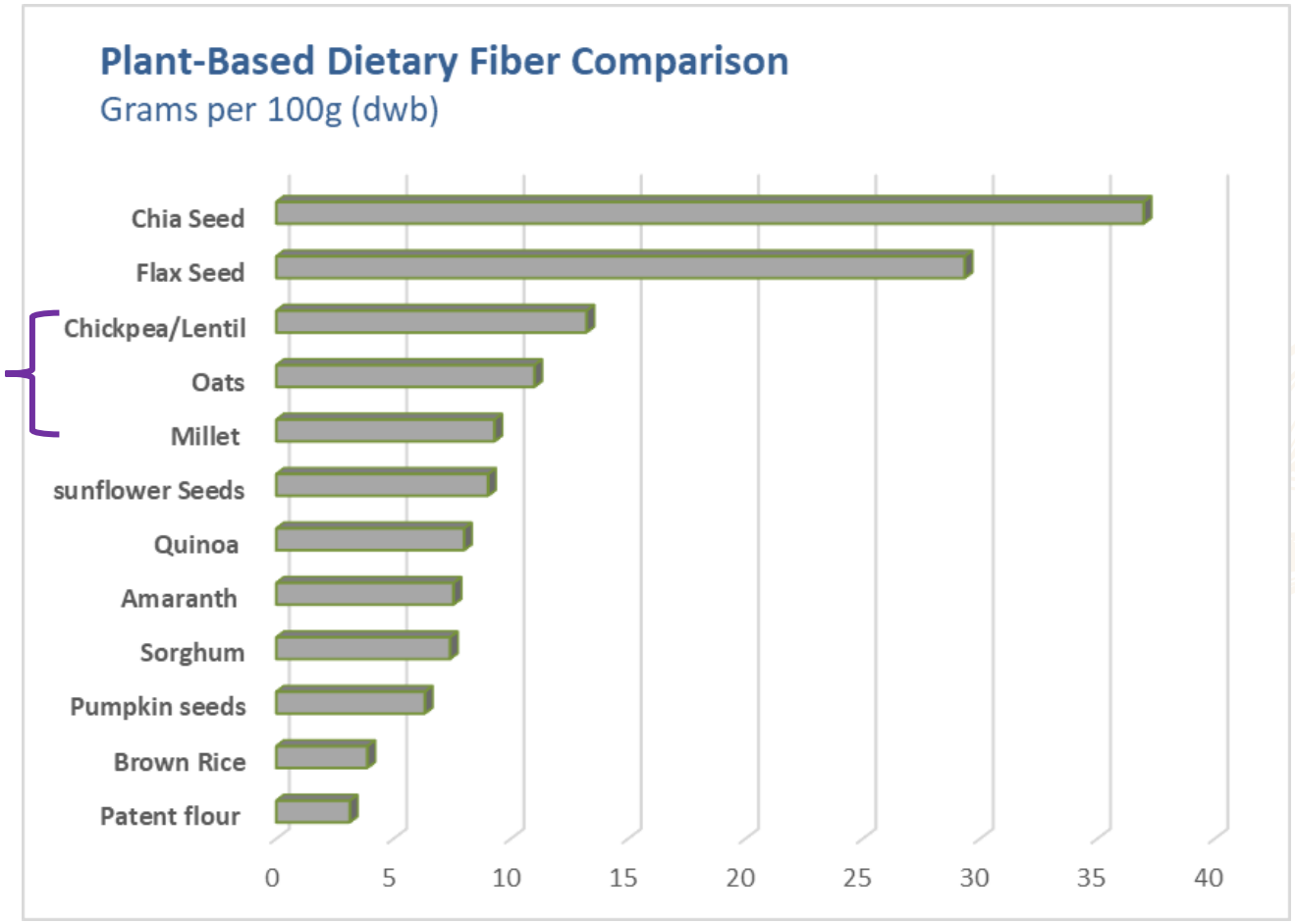
UNITED NATIONS

Plant Based protein:



- Pumpkin, Watermelon and Sunflower top the list on fiber concentration
- With up to twice the protein concentration in Hulless SowNaked™ oats and Chickpea flour compared to patent flour and even more so when compared to rice flours in Gluten free tortillas. Formulating in protein is much more easily obtained with functional flours.
- Protein as nature intended

Plant Based Fiber sources:



- Chia and Flax Seeds top the list on fiber concentration
- Structure building flours sourced from Chickpeas, oats and millet can functionally displace traditional patent flour bringing more then twice the fiber contribution

Bay State Milling at Center of Various Consumer Trends & Supply Chains resiliency.

HEALTHSENSE™

Bay State Milling
A Trusted Family of Ingredients.

Keto-Friendly & Low Net Carb

Digestive Wellness

Fiber Enhancement

Clean Label

Immunity

CLEANDIRT FARM™

BeneGrain

HEALTHSENSE™

Appendix