TRENDS IN HEALTHY TORTILLAS & FORMULATION CHALLENGES

By:
Shima Agah, Ph.D
Allied Blending LP

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R&D Food Scientist

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The Healthy Trends

- The Dietary Guidelines provides guidance for choosing a healthy diet and focuses on preventing the diet-related chronic diseases that continue to affect our population.
- The recommendations helped many today's consumers to consider food as an essential component of overall health & wellness.
- Hence the healthy trend arose from customers not only wanting to easily understand ingredients on their food label and demanding to use fewer additives, they're also seeking products with added health benefits such as disease prevention and weight loss.

(2015-2020 Dietary Guidelines for Americans)

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Tortillas Healthy Trends

- Tortillas have become very popular baked products world wide.
- Because of versatility, functionally, and convenience as wraps.
- The low cost of tortillas, ease of preparation and a range of options for customers are key drivers for a strong industry.
- Health is getting a buzzword in the tortilla segment.
- The growing demand for healthy options continues to be a driving force in tortilla industry.
- Although traditional corn and flour tortilla comprise the bulk of tortilla manufacturing, the market has evolved to include niche offering that provide healthy flavorful alternatives.

(Jondiko et al., 2016 & Tuncil, et al., 2016)

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Tortillas Healthy Trends

- As the new tortilla options continue to flood the market, the customer trends are showing tortillas are becoming more and more of a staple in daily meal planning in homes.
- The tortilla industry will continue to strive for nutritious and healthy, upping its already vast set of offerings.
- Thus there is a need to develop ingredients with improved functionality to market newly developed healthy products for tortilla industry.
- Understanding the impact of these alternative formulations on processability, finished product quality and shelf stability continues to be a challenge.

(Jondiko et al., 2016 & Tuncil, et al., 2016)

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The Healthy Trends in Tortilla

- Low Fat
- Reduced/Low Sodium
- High Fiber
- Whole Grains
- High Protein
- No Trans-Fat
- No Cholesterol
- Reduced /No Sugar

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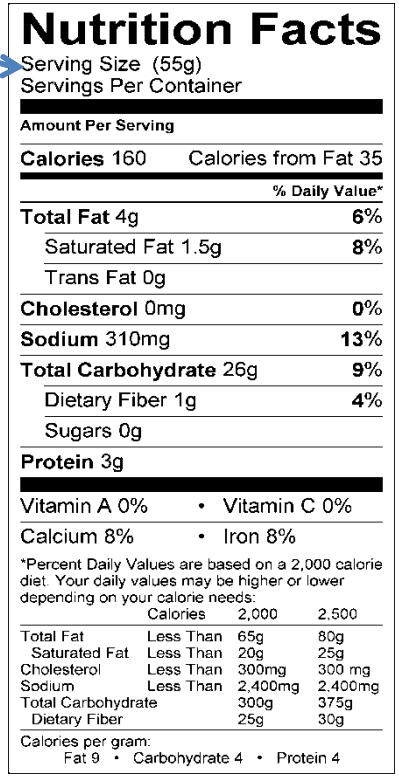
Dietary Guidelines for Americans

- Foods and Food Components to Reduce
  - Trans-Fat
  - Fat
  - Sodium
  - Carbohydrates
  - Calories
- Foods and Nutrients to Increase
  - Whole Grains
  - Multiple Grains
  - Fiber
  - Pre/Pro-biotics
  - Protein
  - Vitamins & Minerals

Reference Amount Customarily Consumed (RACC)



Nutrition Facts

Serving Size (55g)
Servings Per Container

Amount Per Serving

Calories 160	Calories from Fat 35
	% Daily Value*
Total Fat 4g	**6%**
Saturated Fat 1.5g	**8%**
Trans Fat 0g	
Cholesterol 0mg	**0%**
Sodium 310mg	**13%**
Total Carbohydrate 26g	**9%**
Dietary Fiber 1g	**4%**
Sugars 0g	
Protein 3g	

Vitamin A 0% • Vitamin C 0%
Calcium 8% • Iron 8%

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:

	Calories	2,000	2,500
Total Fat	Less Than	65g	80g
Saturated Fat	Less Than	20g	25g
Cholesterol	Less Than	300mg	300 mg
Sodium	Less Than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

Calories per gram:
Fat 9 • Carbohydrate 4 • Protein 4

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Healthy Tortillas Trend Challenges

- With diverse range of product comes a series of challenges.
- Tortilla formulators continue to simplify and use more natural ingredients through product offering.
- Even though healthy products are becoming an expectation for many consumers, they are not willing to trade healthier for diminished quality or taste.
- Consumer and customer education might also be required.
- Developing a product with improved nutritional profiles can be a complex process as it often involves removing or replacing highly functional ingredients traditionally used for specific purposes.

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(Parker, L., 2018 & Roth, J., 2012)

Healthy Tortillas Trend Challenges

- This rebalancing of ingredients can affect the products shelf life, flavor (sensory), texture, storage and other quality key characteristics that consumers expect to remain similar.
- Hence, it is important to ensure that such alternative ingredients do not interact with other ingredients in the formulation and affect the appearance or taste of the finished product.
- R&D departments have to deal with the paucity of technical and product development expertise for formulating with alternatives.
- Formulation and processing products with better nutritional profiles can be constraining to both supply and processing.

THE CHALLENGE

(Parker, L., 2017 & Parker, L., 2018)

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Healthy Tortillas Trend Challenges

- Furthermore, it is important for R&D to communicate price differentials in reformulations for cost/benefit analysis to finance and manufacturing for a systems-wide check as to whether the healthy version is really needed and valued by the marketplace.
- Therefore, cost differentials must be compensated by marketing and claims wherever possible.
- Healthy products are not always as robust as their conventional counterparts.
- A strong understanding of these market forces driving demand for healthy tortilla as well as mastery of functional performances and sensory requirements is necessary to bring these new items to market successfully.

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(Parker., L., 2018 & Schafer., R., 2015)

Dietary Guidelines for Americans- Foods and Food Components to Reduce

- Trans-Fat
  - Most trans fat is formed through an industrial process that adds hydrogen to vegetable oil, which causes the oil to become solid at room temperature.
  - This partially hydrogenated oil is less likely to spoil, so foods made with it have a longer shelf life.
  - Generally these synthetic trans-fatty acids come from hydrogenated shortening.
  - Trans fat has shown to contribute to bad cholesterol (LDL) and developing heart disease and stroke.
  - Now a required part of the Nutritional Labeling.
  - The FDA has determined that partially hydrogenated vegetable oil is no longer "generally recognized as safe" and should be phased out of the production.

(BEJOSANO et al., 2006 & BEJOSANO et al., 2005)

Dietary Guidelines for Americans- Foods and Food Components to Reduce

- Trans-Fat Free Tortillas
  - There are a variety of alternative fats from which to choose.
  - Generally, unmodified vegetable oils do not contain significant amounts of trans fat are mostly liquid at room temperature and may not have the desired functionality of solid shortenings.
  - Some unmodified fats are available that have been made by fractionation, interesterification, or blending of saturated and polyunsaturated oils. And an example of a room temperature solid fat is palm oil.
  - The key is to source fats that meet the guideline of no-trans-fat and adjust the formula to compensate for changes to the dough.

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(BEJOSANO et al., 2006 & BEJOSANO et al., 2005)

Dietary Guidelines for Americans- Foods and Food Components to Reduce

- Fat
  - Saturated fat raises total cholesterol.
  - In a healthy diet, 20 to 35 percent of your total daily calories can come from fat but saturated fat should account for less than 10 percent of total daily calories.
  - Fats play important roles on dough behavior (machinability), processing and quality of end product.
  - Fat has a large influence on tortilla flavor, texture, shelf stability and preventing staling.
  - When reducing fat in tortilla formulas you want to include ingredients that will contribute to the textural properties that fat makes to the tortilla.
  - In order to meet both low fat and low saturated fat requirement, a maximum ~7% of shortening should be used.

Typical Fat level per 55 g

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Calories per gram:
Fat 9 • Carbohydrate 4 • Protein 4

(BEJOSANO et al., 2006 & SEANNEMAN et al., 2011)

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Dietary Guidelines for Americans- Foods and Food Components to Reduce

- To compensate for less shortening, amount of water will be slightly higher to achieve desired dough consistency.
  - **Fiber**
  - **Gums**
  - **Emulsifier**

	Fat Free	Low Fat	Reduced/Less Fat
Total Fat	Less than 0.5 g per RACC and per labeled serving.	3 g or less per RACC (and per 50 g if RACC is small).	At least 25% less fat per RACC than an appropriate reference food.
For Tortillas	**Total Fat < 0.5 g / 55g**	**Total Fat ≤ 3.0 g/ 55 g Saturated Fat ≤ 1g**	**Total Fat ≤ 3.0 g / 55g Saturated Fat ≤ 1g**
Saturated Fat	Less than 0.5 g saturated fat and less than 0.5 g trans fatty acids per RACC and per labeled serving.	1 g or less per RACC and 15% or less of calories from saturated fat.	At least 25% less saturated fat per RACC than an appropriate reference food.

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Dietary Guidelines for Americans- Foods and Food Components to Reduce

- Sugar
  - Excessive sugar consumption is linked to numerous health conditions, including:
    - Obesity and metabolic syndrome
    - Heart disease
    - Type 2 diabetes
    - High blood pressure and cholesterol
    - Chronic inflammation
    - Non-alcoholic fatty liver disease
    - Dental plaque and cavities

  - Sugars from natural sources are with other nutrients such as fiber, vitamins and antioxidants.
  - Added sugar refers to the sugar added to foods during manufacturing.

(Johnson., J. 2017 & FDA Regulatory Requirements for Nutrient Content Claims)

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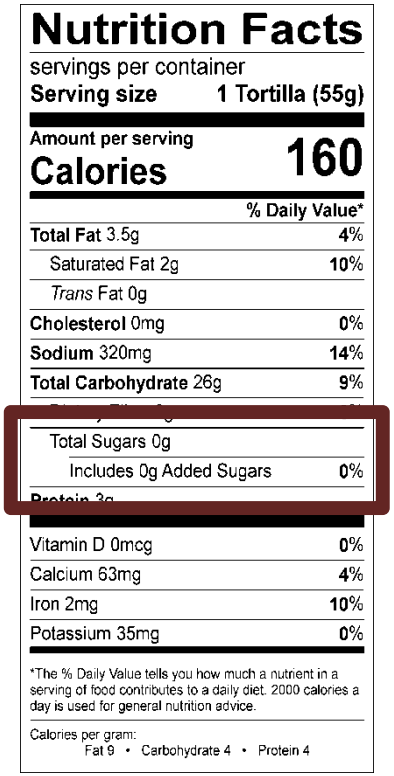
Dietary Guidelines for Americans- Foods and Food Components to Reduce

- Added Sugar
  - These sugars contribute calories to your diet without the benefit of valuable nutrients.
  - Added sugars are a new required line in nutrition facts label and under scrutiny by consumers.
  - Healthy eating patterns limit added sugars to less than **10 percent** of calories per day.
  - That's 200 calories, or about 12 teaspoons, for a 2,000 calorie diet.
  - The average American gets **270 calories (15 percent)** of added sugars each day.
  - "**Sugar Free":** Less than **0.5 g sugars** per RACC and per labeled serving.
  - "**Reduced Sugar**: A product should have **25% less sugar** than the original item.



Nutrition Facts

servings per container

Serving size **1 Tortilla (55g)**

Amount per serving

Calories **160**

	% Daily Value*
Total Fat 3.5g	**4%**
Saturated Fat 2g	**10%**
Trans Fat 0g	
Cholesterol 0mg	**0%**
Sodium 320mg	**14%**
Total Carbohydrate 26g	**9%**
Total Sugars 0g	
Includes 0g Added Sugars	**0%**
Protein 3g	
Vitamin D 0mcg	**0%**
Calcium 63mg	**4%**
Iron 2mg	**10%**
Potassium 35mg	**0%**

*The % Daily Value tells you how much a nutrient in a serving of food contributes to a daily diet. 2000 calories a day is used for general nutrition advice.

Calories per gram:
Fat 9 • Carbohydrate 4 • Protein 4

(Johnson., J. 2017 & FDA Regulatory Requirements for Nutrient Content Claims)

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Dietary Guidelines for Americans- Foods and Food Components to Reduce

- Sodium
  - Decreasing sodium intake is advisable to reduce risk of:
    - Elevated blood pressure
    - Coronary heart disease
    - Stroke
    - Congestive heart failure
    - Kidney disease

  - Salt is the main source of sodium in the diet.
    - Recommended level of sodium consumption = 1 teaspoon of salt per day (less than 2,300 milligrams (mg))
    - For those 40 and over, African-American, or with high blood pressure, it is about 1,500 mg per day.
    - Average Americans consume 50 percent more 3,440 mg per day.

(Jaret., P. 2008 & FDA Regulatory Requirements for Nutrient Content Claims)

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Dietary Guidelines for Americans- Foods and Food Components to Reduce

- **Low Sodium and Reduced Sodium Tortillas**
  - The amount of sodium in retail tortillas ranges **from 280 mg to 430 mg** per 55 g serving.
  - To classify as **Low Sodium**, a product should have a maximum of **140 mg** sodium per serving.
  - To classify as **Reduced Sodium**, a product should have **25% less sodium** than the referenced regular tortilla.

  - To reduce sodium content of tortillas, the common sources of sodium in the formulation must be identified and reduced.
  - In reformulating tortillas to meet new sodium requirements, finished products should not be adversely affected.

    - **Taste**
    - **processing properties**
    - **overall quality**
    - **shelf-life**
    - **cost**

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(FDA Regulatory Requirements for Nutrient Content Claims)

Dietary Guidelines for Americans- Foods and Food Components to Reduce

- Most are functional ingredients:

  - **Salt, sodium chloride**
  - **Sodium Bicarbonate (Leavening)**
  - **Sodium Aluminum Sulfate (Leavening)**
  - **Sodium Aluminum Phosphate (Leavening)**
  - **Sodium Acid Pyrophosphate (Leavening)**
  - **Sodium Propionate (Preservative)**
  - **SSL, Sodium Stearoyl Lactylate (Emulsifier)**
  - **Sodium Metabisulfate (Reducing Agent)**

  - Strategies to reduce sodium in tortillas:
    - Reduce Salt
    - Adjust or replace sodium based leavening, emulsifier, reducing agent and preservative salts with alternatives.
    - Potassium and calcium based functional ingredients.
      - Potassium Bicarbonate
      - Calcium Acid Pyrophosphate

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Dietary Guidelines for Americans- Foods and Food Components to Reduce

- **Carbohydrates – Starches and Flours**
  - Carbohydrates are used as an energy source by the body.
  - Complex carbohydrates (starches) are broken down into simple sugars during digestion and increase level of blood sugar.
  - Extra glucose is usually stored in your liver, muscles and other cells for later use or is converted to long chain fatty acids and stored as fat.
  - The idea behind the low-carb diet is reducing the carbohydrate content (blood sugar) which reduces the conversion to fat which causes the body to burn stored fat for energy and ultimately leads to weight loss.

LOW CARB®

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(Eenfeldt., A 2019)

Dietary Guidelines for Americans- Foods and Food Components to Reduce

- **Low-Carb Tortillas**
  - The key to formulating Low-Carb is to use Carbs (natural complex) that are not digestible and not able to be converted to fatty acids or alternative nutritional ingredients.

  - To compensate for less carbohydrates, alternative ingredients that can contribute to the tortilla texture and mouthfeel in positive ways are required.
    - **Cellulose**
    - **Wheat Protein Isolates**
    - **Oat Fibers**
    - **Vital Wheat Gluten**
    - **Soy Flour**

INGREDIENTS: WATER, OAT FIBER, WHOLE WHEAT FLOUR, SOY FLOUR, WHEAT GLUTEN, EXPELLER PRESSED CANOLA OIL, CONTAINS 2% OR LESS OF EACH OF: NON-ALUMINUM BAKING POWDER (SODIUM ACID PYROPHOSPHATE, SODIUM BICARBONATE, CORN STARCH, MONOCALCIUM PHOSPHATE), SEA SALT, GUAR GUM, CITRIC ACID, YEAST, XANTHAN GUM.

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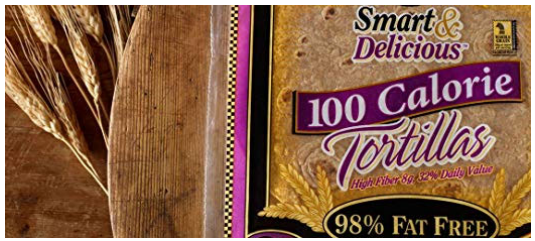
Dietary Guidelines for Americans- Foods and Food Components to Reduce

- **Calories**
  - One of the most challenging aspects of weight loss is cutting back on calories.
  - Reduced calorie products are high in fiber and protein, work to reduce hunger, increase feelings of fullness and improve appetite control.
  - Reduced calorie products are the mainstay of many diet programs.
  - Another recent development is the explosion of the 100-Calorie Product Lines.

- **100-Calorie Tortilla**
  - It's possible to manufacture a 10-inch tortilla containing only 100 calories per 62g serving.
    - Gums, gluten, cellulose, fiber
    - Good source of fiber, Excellent source of calcium, Low fat and No trans fat.



100 CALORIES

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(Kadey., M 2018)

Dietary Guidelines for Americans- Foods and Food Components to Increase

- **Whole Grains**

- Whole grains are important sources of many nutrients, including fiber, B vitamins(thiamin, riboflavin, niacin and folate) and minerals (iron, magnesium and selenium).

- USDA's My Plate recommends making half of your daily grain choices whole grain for healthy eating.

- Whole grain consumption has been shown to be an important component of reducing risk factors for:

  - Type II Diabetes
  - Hypertension
  - Obesity
  - Cardiovascular Disease

- The high fiber, whole grain tortillas have a high satiety level. Anything labeled Whole Wheat has a general health appeal.

(Jennings., K. A, 2016 & U.S. Department of Agriculture. ChooseMyPlate.gov Website 2015)

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Dietary Guidelines for Americans- Foods and Food Components to Increase

- Consumer-friendly label opportunities include:
  - Whole Grain
  - Whole Wheat
  - Good Source of Fiber
  - Heart Healthy

- **Multiple Grains**
  - Another approach to improve the nutritional profile of tortillas is substituting part of the wheat flour with other grains, oilseeds, and legumes, among others.
  - Multigrain tortillas are already available in the market. Some of the grains that are being used are corn, soy, flax, oat, rice, etc.
  - Consumer-friendly label opportunities include:
    - Whole Grain
    - Good Source of Fiber
    - Heart Healthy

(Bitran., T, 2017 & U.S. Department of Agriculture. ChooseMyPlate.gov Website.2015)

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Dietary Guidelines for Americans- Foods and Food Components to Increase

- **Formulating for Whole Wheat and Multiple Grains:**
  - A 55 g tortilla will have about 32 g of flour. Thus, if half of the flour is whole wheat, it will contain 16 g of whole grain. This meets the “whole grain” requirement.
  - The use of a combination of soy flour and soy protein isolate can increase protein by 35%, lysine (two-fold) and net protein utilization and allow Multigrain claims.
  - Some of the grains that are being used have unique nutraceutical properties (e.g., omega-3 from flax, beta-glucan from barley and oats) that can be added into tortillas.
  - When adding these whole grains it is important to formulate the tortilla to offset the negative texture and processing effects these ingredients can cause with addition of gums, emulsifiers, and conditioners.

WHOLE GRAIN GOODNESS

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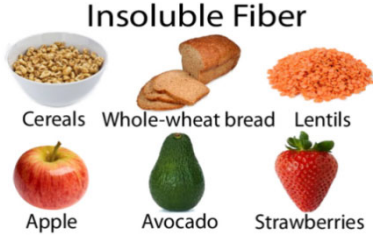
Dietary Guidelines for Americans- Foods and Food Components to Increase

- **Fiber**
  - Increasing fiber claims in tortilla is easily done by using whole wheat and or multiple grains, but it can also be done on a typical wheat flour tortilla by adding additional Insoluble and Soluble fibers to the formulation.
  - High in fiber :must provide at least 20 percent (5 grams) of the daily value (25 grams) for dietary fiber per serving.
  - Good Source of Fiber: supplies between 2.5 grams and 4.9 grams of fiber per serving, or 10 percent to 19.6 percent of the nutrient's daily value.

Dietary Fiber	Source
Insoluble fiber	wheat bran, corn bran, fruit skins
Soluble fiber	psyllium seed husk, peas, beans



(Huizen., J, 2017; FDA Regulatory Requirements for Nutrient Content Claims)

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Formulating Healthy Tortillas (Summary)

- AB R&D team has developed several healthy trend based tortilla BatchPak™ formulations specifically designed to your own preference.
- We do this by supplementing it with other carefully selected functional ingredients to provide the best results.
- **On Trend BatchPak™ Formulations:**
  - Gluten Free
  - Heart Healthy
  - Non-GMO
  - Organic
  - Fluffy White Gordita
  - Low Sodium
  - Low Carb
  - Clean Label
  - Multi-grain
  - Low Fat
- **Summary of Formulation Tips**
  - Not difficult.
  - Know the target.
  - Know the regulations.
  - Expect to change more than the target ingredients for sensory approval.
  - Add all possible claims to the front label- take advantage of your work.
  - Enter the Multi Million Dollar Health Market.

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Conclusions

- The healthy category is growing with no signs of slowing down.
- Developing a solid formulation that focuses on health while offering good taste, texture, and tolerance is critical to ensure consumer acceptance and ultimately market success.
- Allied Blending LP has been partnering with consumers for years to develop healthy and nutritious formulas.
- Our R&D team and technical services group work together with you to develop and implement healthy tortilla formulas that are desired by consumers.

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Our goal is to develop products that meet market demands, provide superior functionality and taste, and exceed customer expectations.

Acknowledgement

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- **Tara Perry**

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J. RETTENMAIER & SÖHNE GMBH + CO KG JRS Fibres designed by Nature

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Questions?

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