IAOM Inaugural South Asia Region Meetings
Delhi, India: December 3-4 2018
Bangalore, India: December 6-7, 2018

Flour Heat Treatment

SUNIL MAHESHWARI
SIEMER MILLING COMPANY
TEUTOPOLIS, IL USA

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What is Flour Heat Treatment?

- Flour Heat Treatment is a process designed to modify the properties of flour.
- Divided into two basic processes:
  - Hydrothermal treatment
  - Thermal treatment
- Stabilize Germ, Bran and Whole Wheat Flour.

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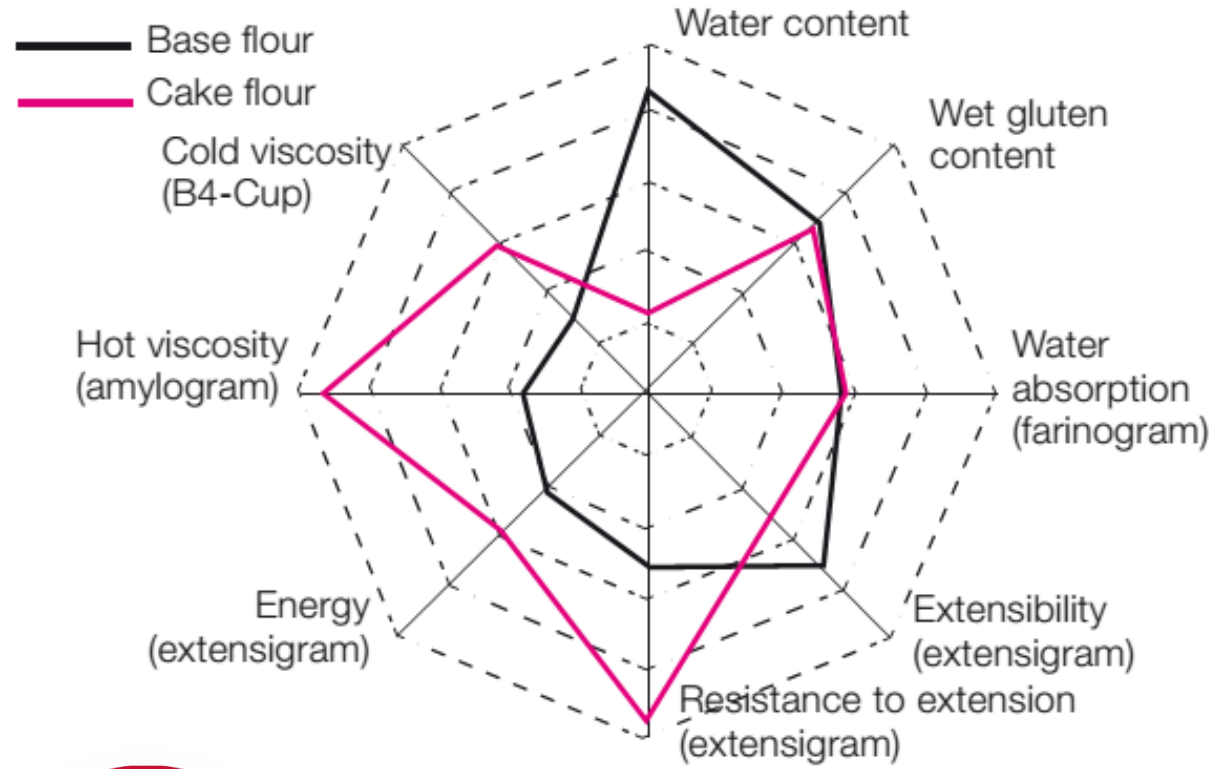
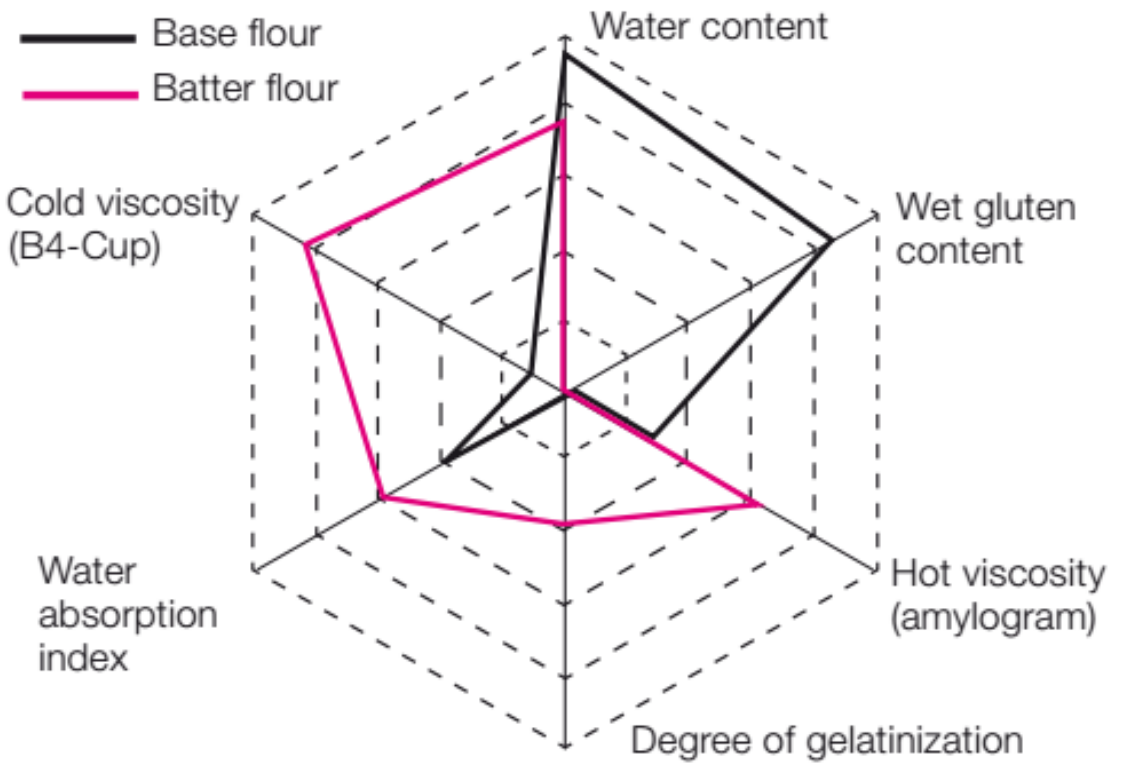
FHT – Product Properties





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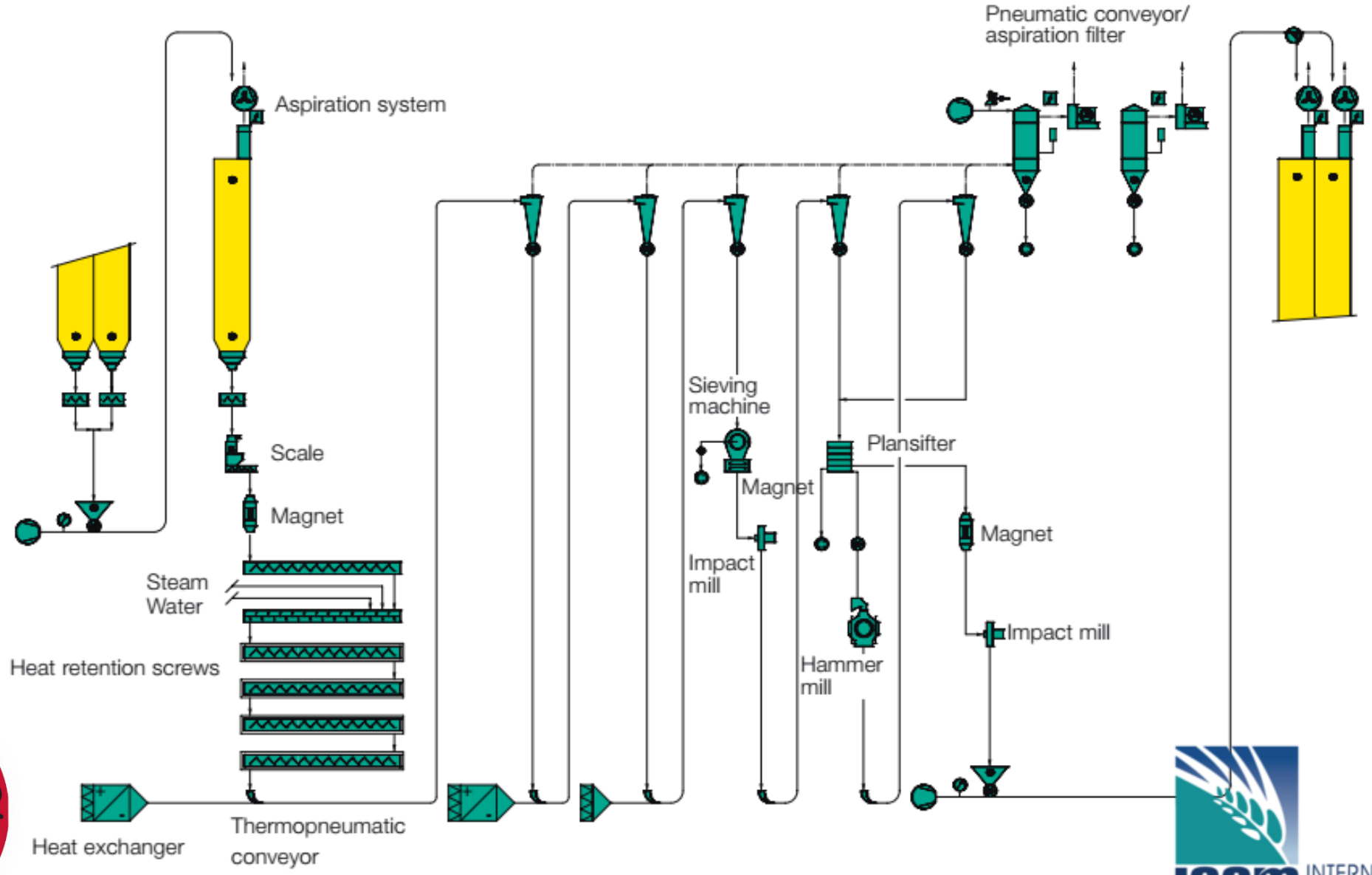

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Siemer FHT 1 Plant
2003

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Siemer FHT 2 Plant
2015

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Process – Key Elements

- Time
- Temperature
- Moisture
- Particle Size
- Viscosity
  - Cold Water Viscosity
  - Hot Pasting Viscosity

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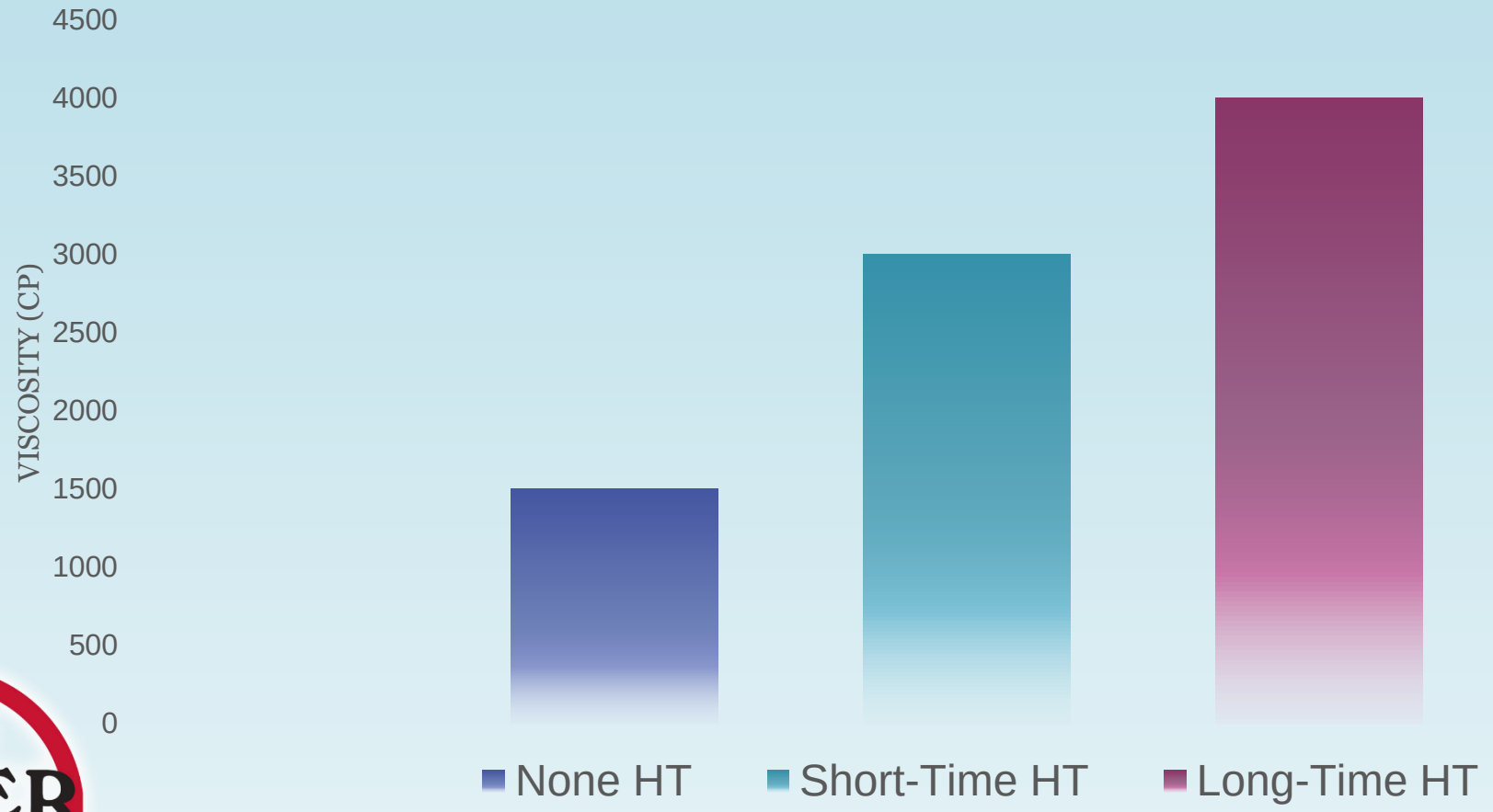
FHT – Viscosity Adjustment



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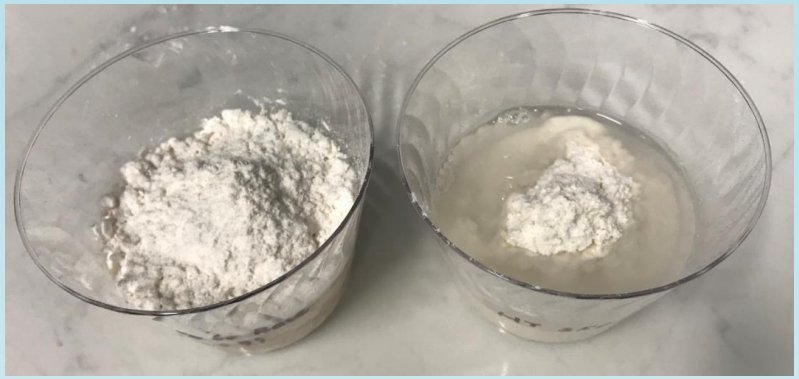
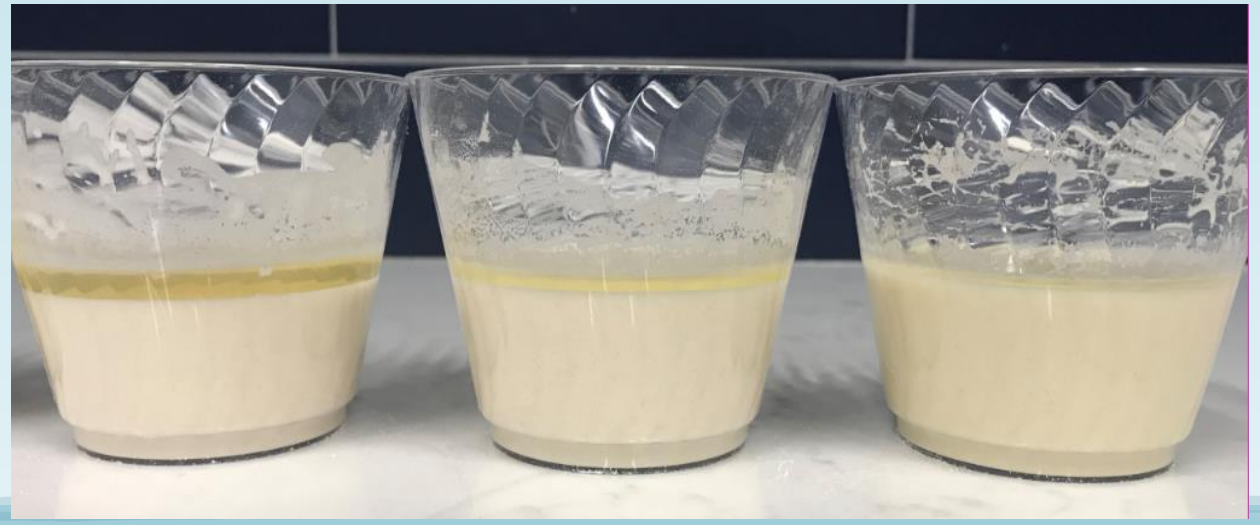
FHT – Viscosity Adjustment



Left: Str. Grade Flour VS Right: HT Flour



Str. Grade Flour HT 3500 HT 8500

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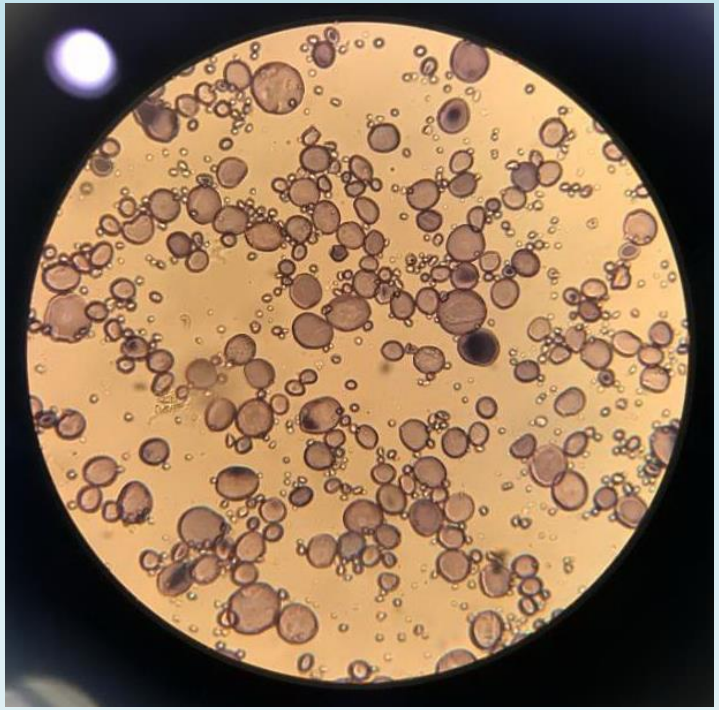
FHT – Starch Molecule Changes

Before Treatment



After Treatment

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FHT Product Application

- Food Safety
- Soup, Sauce and Gravy
- Batter and Breading
- Non-Chlorinated Cake Flour
- Stabilized Bran, Germ and Whole Wheat Flour

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FHT Product Application

- Food Safety
  - Validated 5-log microorganisms reduction
  - For products that may be consumed raw: ice cream inclusion, seasoning blends, etc.
  - Unique process for greater control of microbiological presence
  - Longer shelf-life

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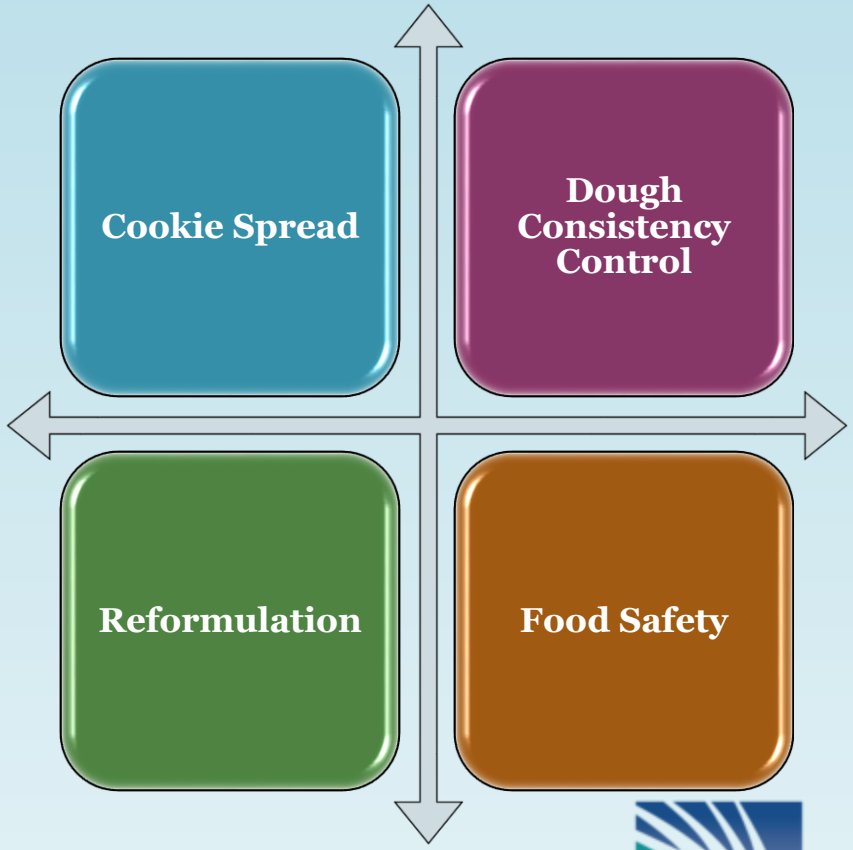
FHT Product Application

Pastry Flour

HT 2000



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FHT Product Application

- Soup, Sauce and Gravy
  - Replacement of chemically modified food starch; clean label
  - Stability
    - pH
    - Shear
    - Freeze-thaw
    - Viscosity
  - Optimum/clean flavor profile
  - Cost-effective

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FHT Product Application

Ingredients	Modified Starch	HT 3000
	Solid/Liquid	Solid/Liquid
Str. Gr. Wheat Flour	6.6%	6.6%
Modified Corn Starch	0.4%	x
HT 3000	x	0.7%
Oil/Fat	7.3%	7.3%
Salt	0.6%	0.6%
Black Pepper	0.2%	0.2%
Milk, Whole	100.0%	100.0%

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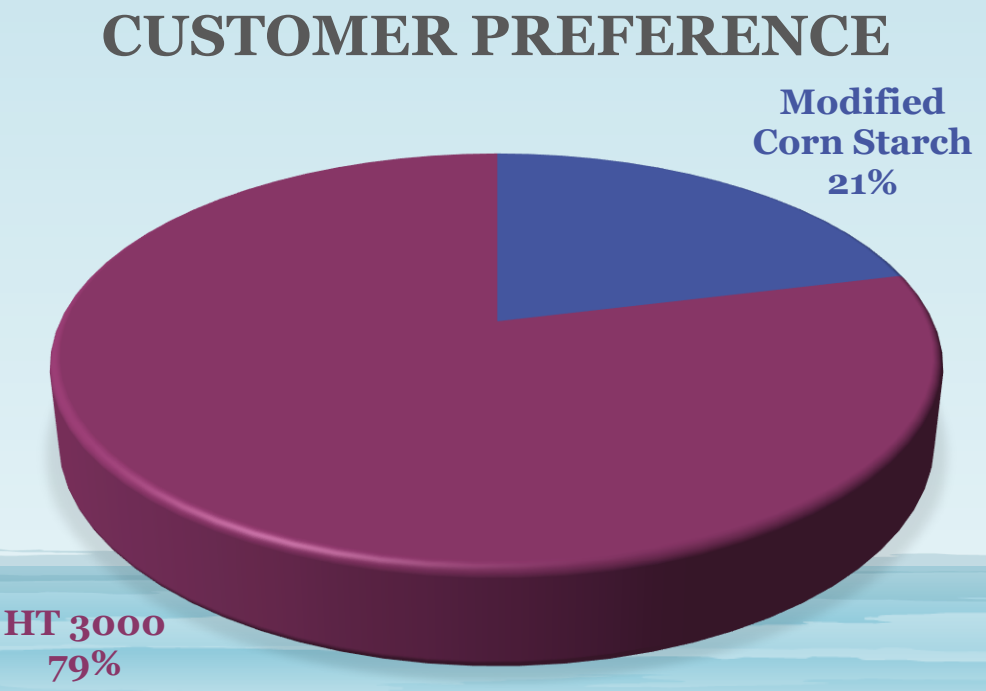
FHT Product Application

- **Sensory Survey**
- A double blind taste test with consumers at a local grocery store
- 52 individuals tasted two samples of cheese sauce



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FHT Product Application

Flavor

Appearance

Texture

Mouthfeel

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FHT Product Application

- Batter and Breading
  - Highly controlled batter viscosity; even coating on substrate
  - Superior adhesion to substrate; prevent moisture from migrating to the other substance components
  - Crispy-to-crunchy textures
  - Extend hold times under heat lamp

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FHT Product Application

Tempura Coating Ingredients	Weight	Percentage
Wheat Flour/HT Flour	150 g	72.8%
Corn Flour	40 g	19.4%
Salt	6 g	2.9%
Seasoned Salt	2 g	1.0%
Baking Powder (MCP & SAPP)	6 g	2.9%
Milk Powder	1 g	0.5%
Dextrose	1 g	0.5%
Water (40 F)	290 g	140.8%

Non-HT Flour

HT 8500

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FHT Product Application

Left: Str. Gr. Flour vs Right: HT 3500

Left: Str. Gr. Flour vs Right: HT 8500

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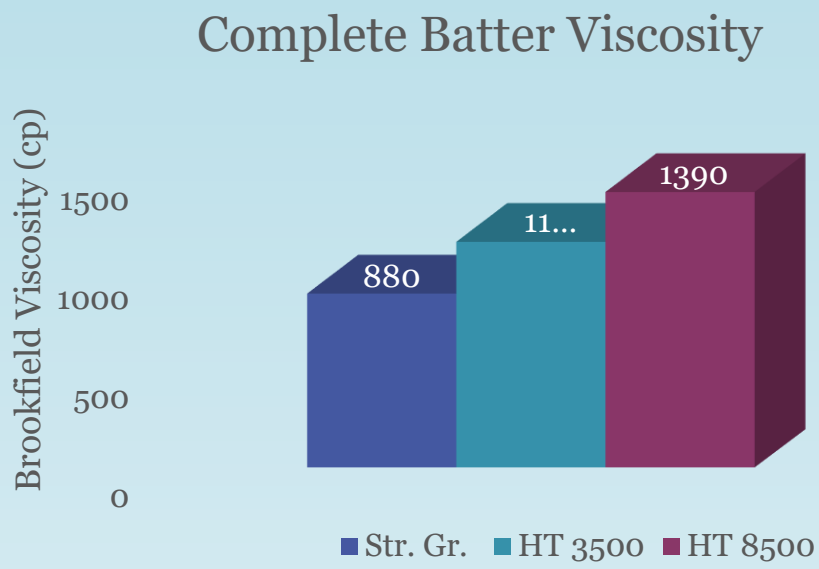
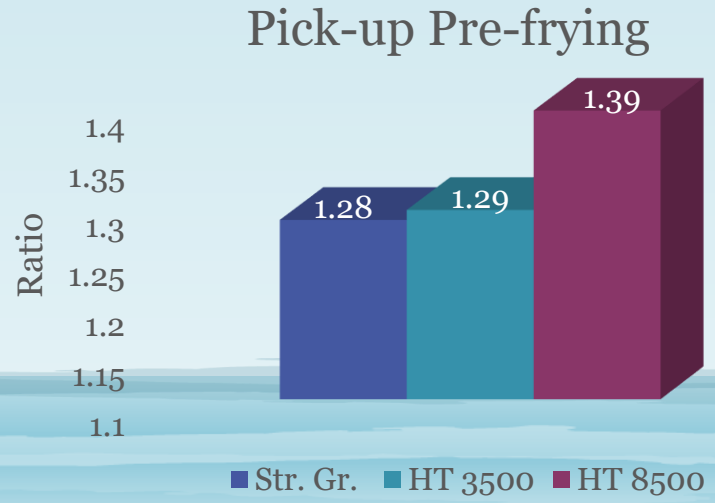
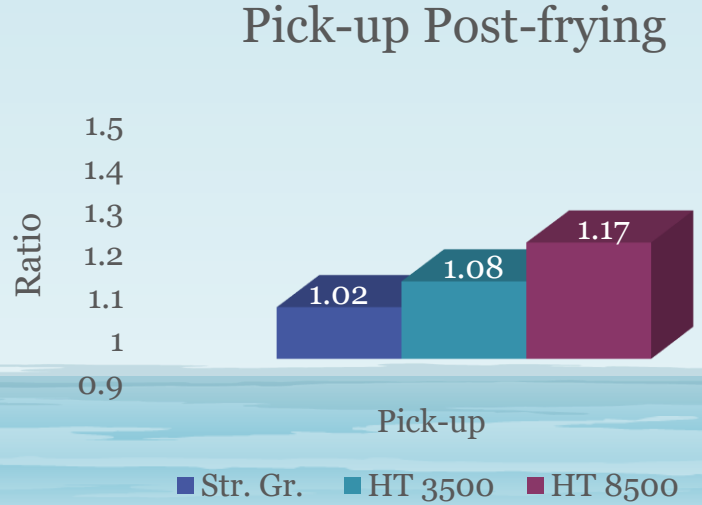
FHT Product Application







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FHT Product Application

- Non-chlorinated Cake Flour
  - Clean label - without chlorination and bleaching
  - Used for cakes with high sugar and fat contents
  - Improved appearance and texture

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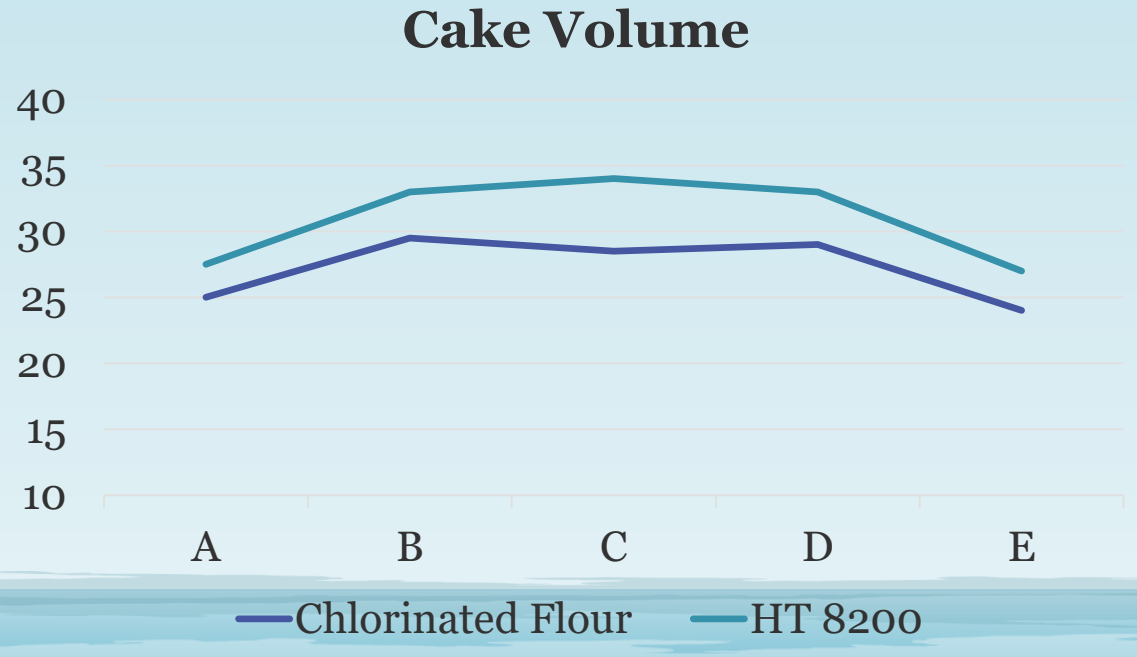
FHT Product Application



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FHT Product Application

- Stabilized Bran, Germ and Whole Wheat Flour
  - Extend shelf-life – 6 to 9 months at ambient temps
  - Deactivate enzymes
  - Does not alter nutritional profile or label ID
  - Pleasant nutty flavor

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FHT Product Application

HT Germ Bread

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Thank You!

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