International Flavors & Fragrances Inc.

SSP Symposia

Advancing Sensory Science
by Integrating Perceptual,
Cognitive and Behavioral
Psychology

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Director Global Strategic Insights**

*The Variation of Ingredient Reactions
due to the Context of Food
Applications*

September 28, 2018

IFF

Consumer needs are shifting in a way never experienced before. How do we **design taste and deliver well-being** in this brave new world?

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Re-Imagine Natural™

Natural, organic and label-friendly taste design-crafted to address the increased desire for trust, transparency, and health

2016 Online Consumer Research Food Label Attitudes Survey

United States, Germany, China and Turkey

Ingredient Label Suitability

Online Survey- of consumers that read food labels

71% of consumers

believe **NATURAL FLAVORS** are **SUITABLE** for **CONSUMPTION**

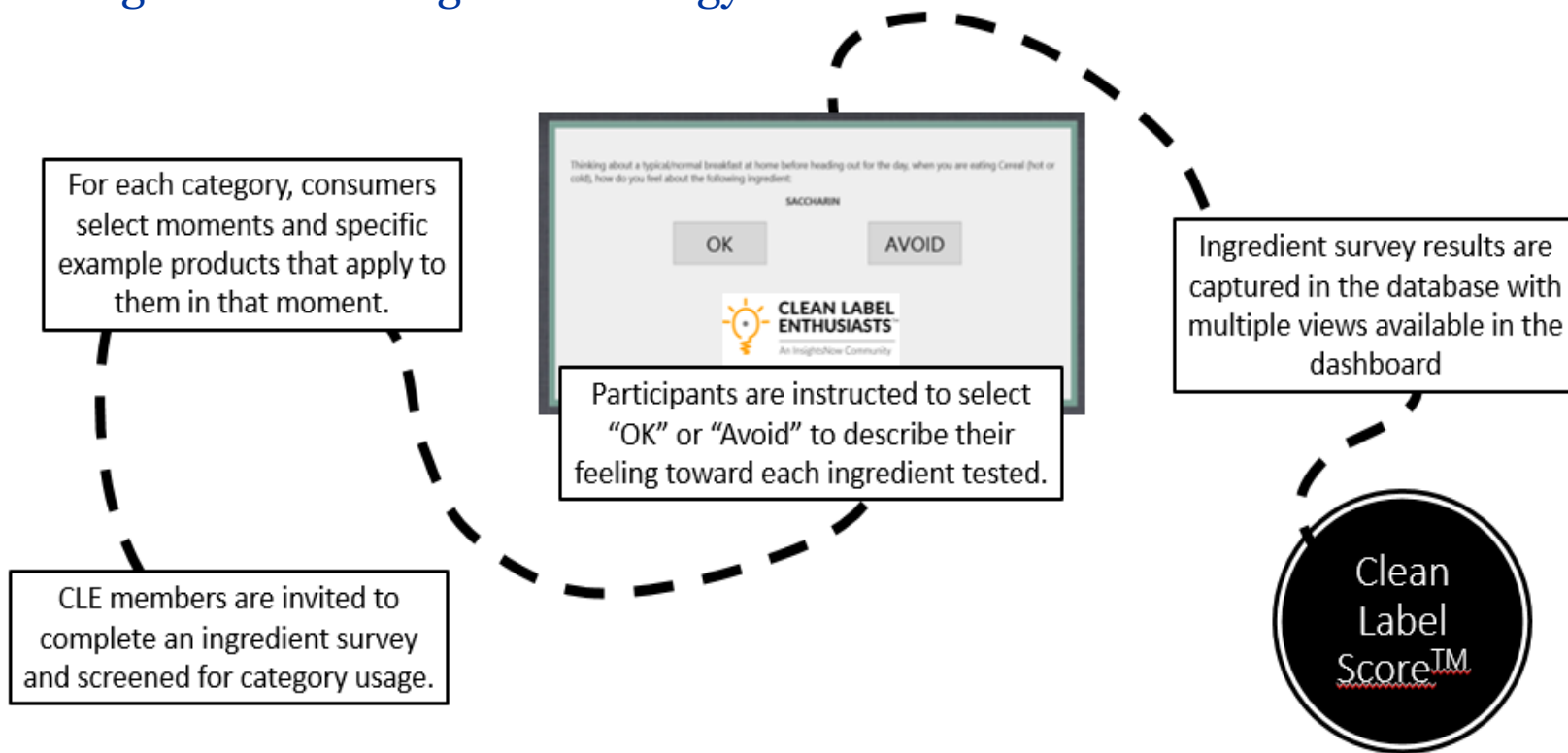|	Suitable for consumption	Undesirable for consumption	Unfamiliar but feel it is SAFE	Unfamiliar but think it is UNSAFE
Salt	66%	25%	6%	3%
Sodium Chloride	28%	30%	21%	20%
Natural Flavors	71%	11%	14%	4%
Artificial Flavors	16%	56%	14%	14%
Enzymes	43%	21%	25%	11%
Sodium Benzoate	9%	27%	24%	41%
Monosodium Glutamate (MSG)	16%	35%	23%	25%

Powered by

CLEAN LABEL ENTHUSIASTS™
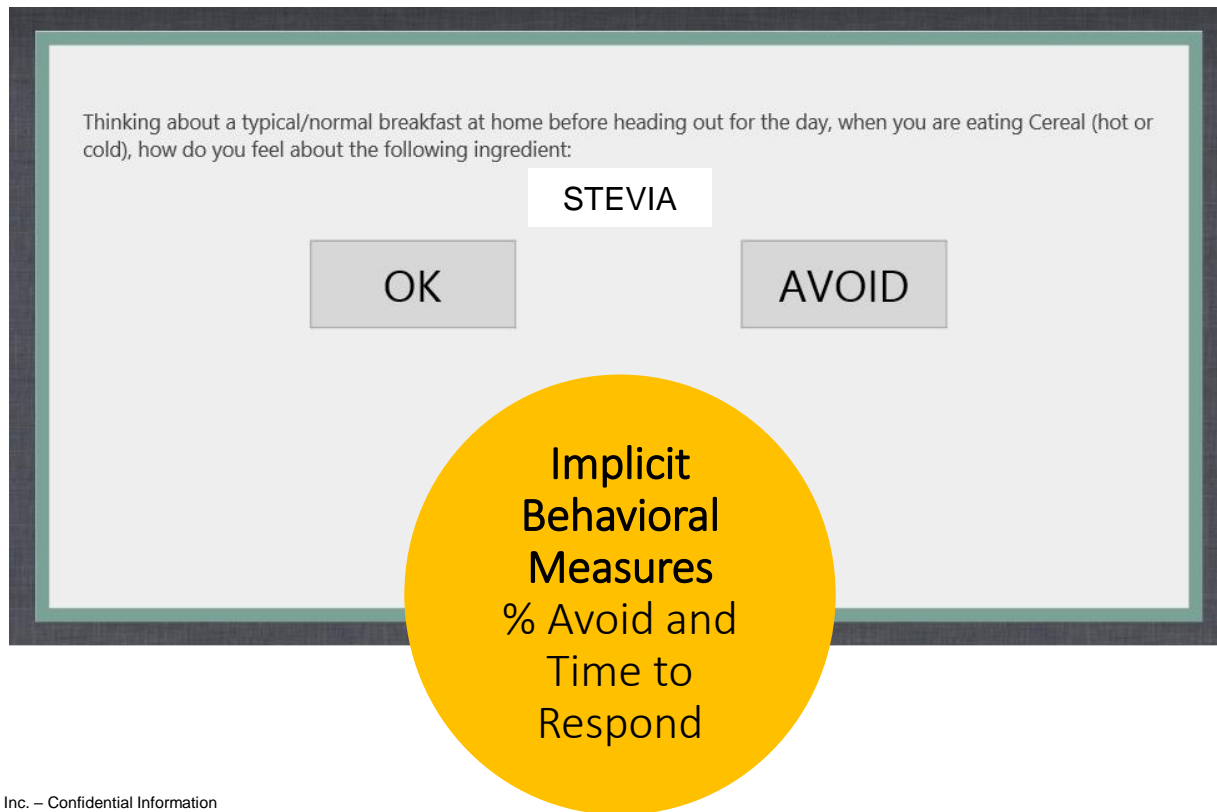
An InsightsNow Community

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Voice of the Consumer

CLE™ Ingredient Scoring Methodology

For each category, consumers select moments and specific example products that apply to them in that moment.

CLE members are invited to complete an ingredient survey and screened for category usage.

Thinking about a typical/normal breakfast at home before heading out for the day, when you are eating Cereal (hot or cold), how do you feel about the following ingredient:

SACCHARIN

OK   AVOID

CLEAN LABEL ENTHUSIASTS
An InsightsNow Community

Participants are instructed to select "OK" or "Avoid" to describe their feeling toward each ingredient tested.

Ingredient survey results are captured in the database with multiple views available in the dashboard

Clean Label Score™

InsightsNow

Voice of the Consumer

CLE™ Ingredient Scoring Methodology

Thinking about a typical/normal breakfast at home before heading out for the day, when you are eating Cereal (hot or cold), how do you feel about the following ingredient:

STEVIA

OK

AVOID

Implicit Behavioral Measures % Avoid and Time to Respond

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Data Treatment of Response Times

Each participant gets their own, personal cutoff time for what is "fast"

Today we will be using a question style which monitors how fast you answer. The next set of questions will help us personalize the questions for you.

Please pick three numbers and remember which three you picked.

☐ One
☐ Two
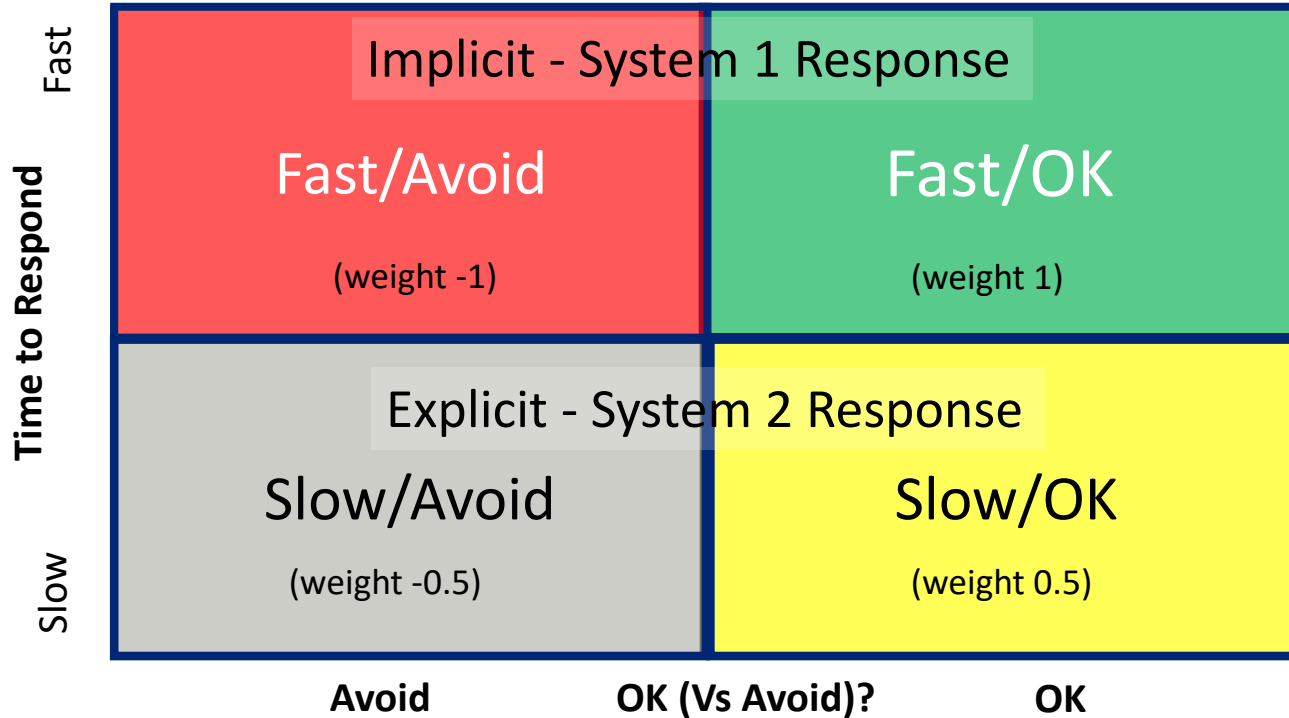☐ Three
☐ Four
☐ Five
☐ Six
☐ Seven
☐ Eight
☐ Nine
☐ Ten

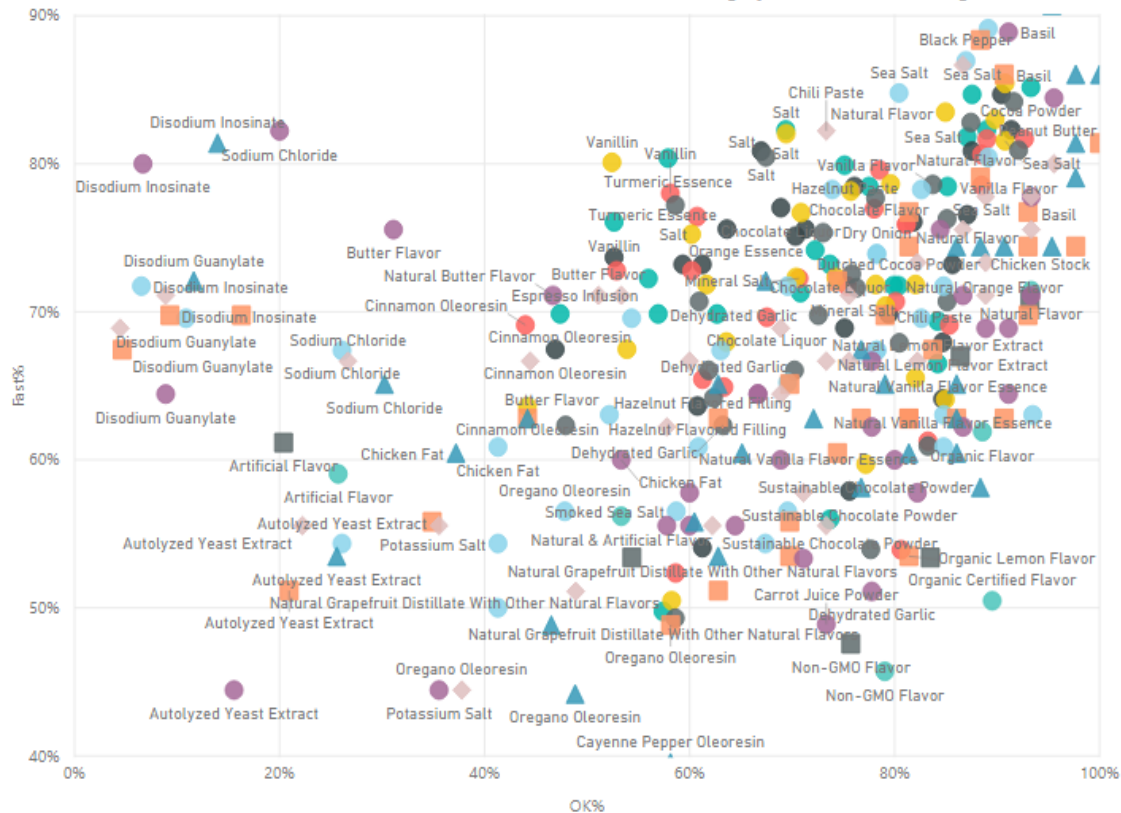Was this one of the three numbers you picked?

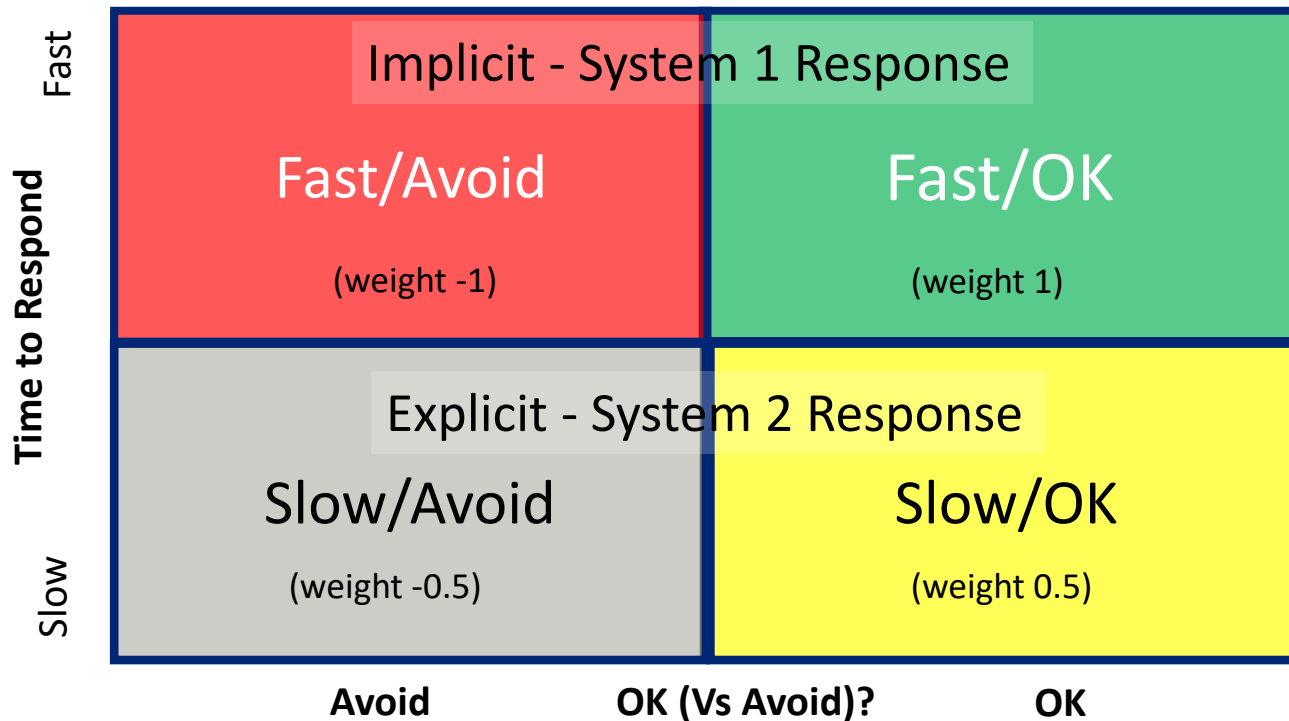**One**

Yes   No

Calculation of the Clean Label Score™

	Avoid	OK (Vs Avoid)?	OK
Fast	Implicit - System 1 Response		
	Fast/Avoid (weight -1)		Fast/OK (weight 1)
Slow	Explicit - System 2 Response		
	Slow/Avoid (weight -0.5)		Slow/OK (weight 0.5)

Time to Respond

Calculation of the Clean Label Score™

Calculation of the Clean Label Score™

	Avoid	**OK (Vs Avoid)?**	**OK**

Fast (top) / **Slow** (bottom) — **Time to Respond**

Implicit - System 1 Response

Fast/Avoid (weight -1)	Fast/OK (weight 1)

Explicit - System 2 Response

Slow/Avoid (weight -0.5)	Slow/OK (weight 0.5)

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Insights Through Access

Quick, Custom Clean Label Consumer Reports

Clean Label Score Comparisons

Food Categories
Moments of Use
Demographic Segments
Custom Segments
Shopper (Retailer) Targets

Other Views

Clean Label Score Distributions
Clean Label Scores Drill Downs
Implicit Measures
Products Selected
Claim Influence
Category Moment Statements
Comments on Brands

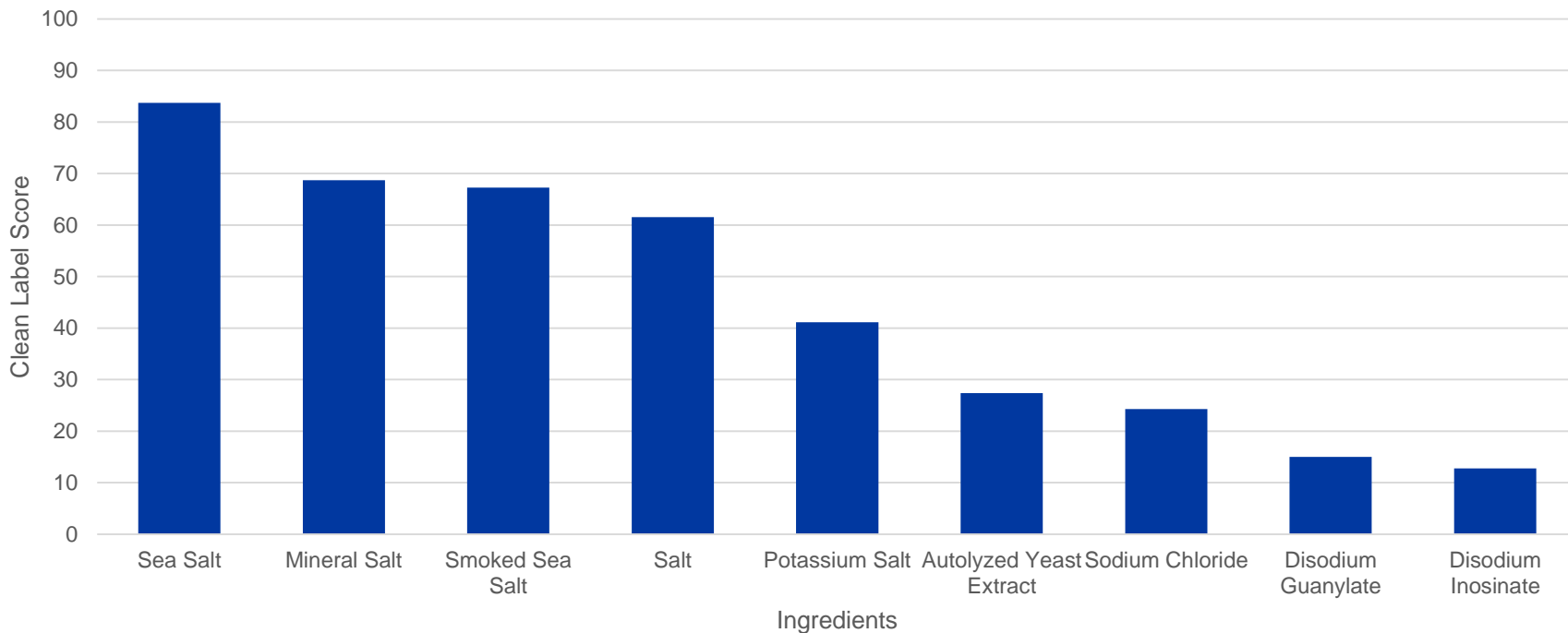# *Context matters...*
Error is introduced if you are not controlling for it

For ingredients the most concerning context effect is the compromise effect which means that acceptability of different ingredients change based on the context within which they are seen.

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Same Ingredient Set Across Different Need State Moments

Trade-offs consumers make for convenience vs. health

	Soups Comfort	Soups Convenience	Soups Health	Soups Nourishment	Soups Pleasure
Chicken Stock	**86.41 A**	**94.19 A**	**82.78 A**	**83.72 A**	**88.33 A**
Natural Chicken Flavor	**84.78 A**	**84.88 A**	**72.78 AB**	**75.00 A**	**78.89 A**
Organic Chicken Flavor	***78.26 A***	**77.33 A**	**62.78 AB**	**73.26 A**	**73.89 A**
Chicken Bouillon	**72.83 A**	**79.65 A**	**66.11 AB**	**66.28 A**	**71.67 A**
Chicken Fat	**42.39 B**	**48.84 B**	**52.22 B**	**42.44 B**	**43.33 B**
Overall Mean	72.93	**76.98**	**67.33**	68.14	71.22
Unique Resp.	46	43	45	43	45
P-value	<0.0010	<0.0010	<0.0051	<0.0010	<0.0010

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*As with most things, **who** you ask matters, the acceptability of an ingredient may change, based on the context of the consumer **demographic** you are asking*

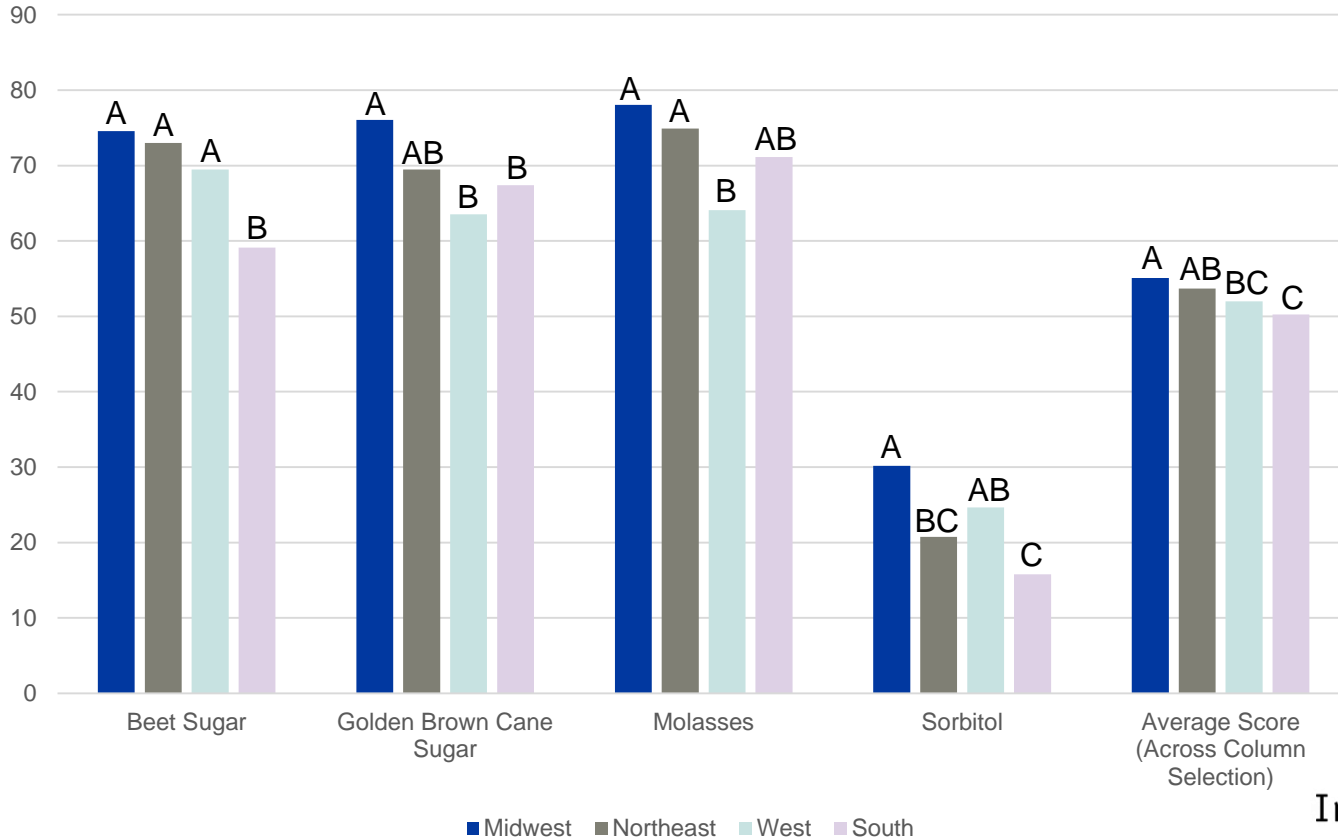*-education level*
-region of the US
-age/generation
-gender

Salts by Education

Sodium Chloride scores- education effect
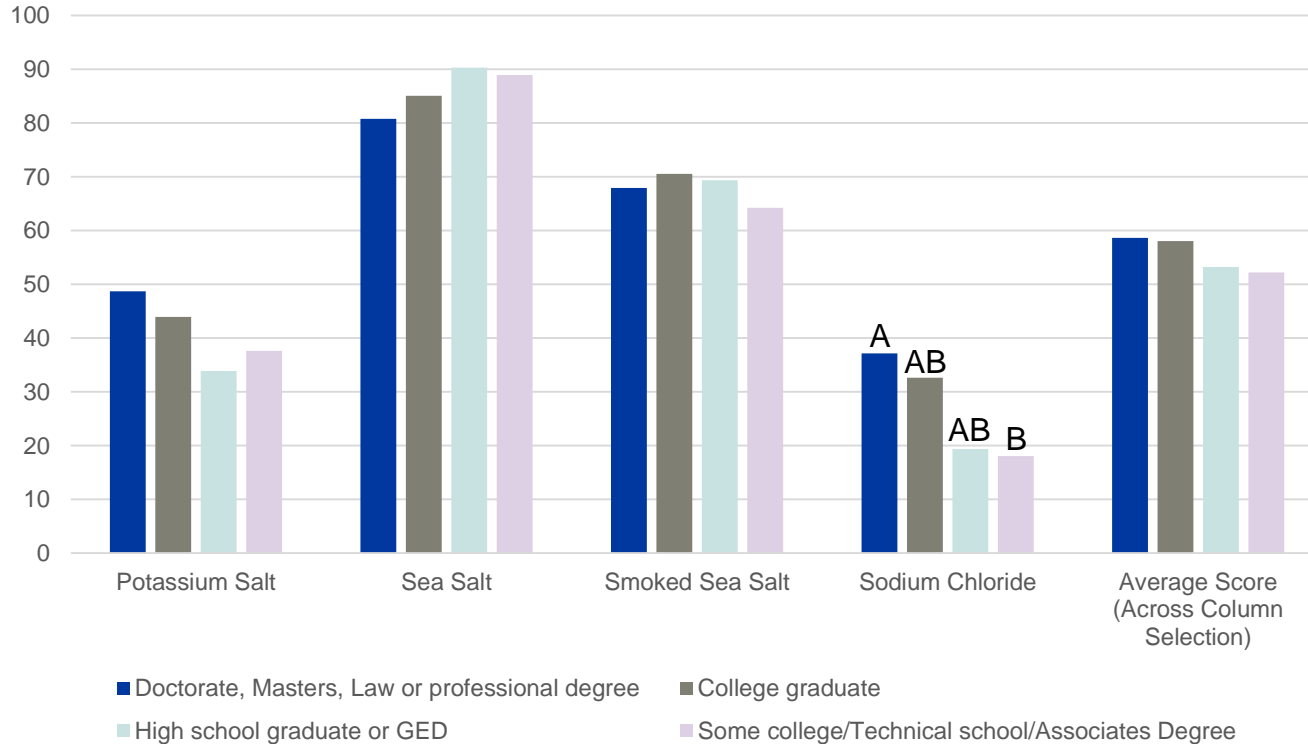
Sweeteners by Region

But sweetener scores do!

Chart showing sweetener scores by region (Midwest, Northeast, West, South) for Beet Sugar, Golden Brown Cane Sugar, Molasses, Sorbitol, and Average Score (Across Column Selection).

Beyond demographics, the acceptability of an ingredient may change, based on the context of consumer **values**
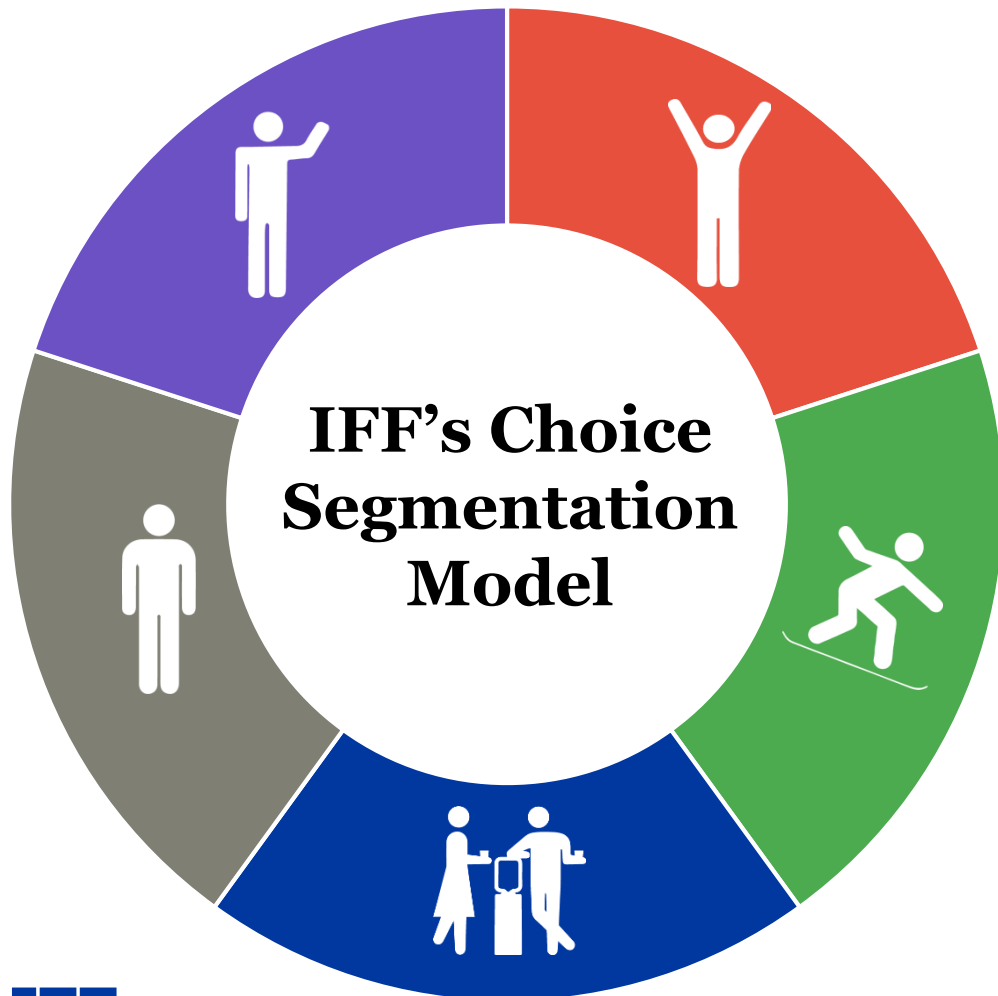
Global Segmentation Model Based on Consumer Values

- Increases **efficiency** and our ability to recommend the **types of flavors** that are appealing to segments of consumers

- Complements traditional models

- **Modular** - lends to combining techniques
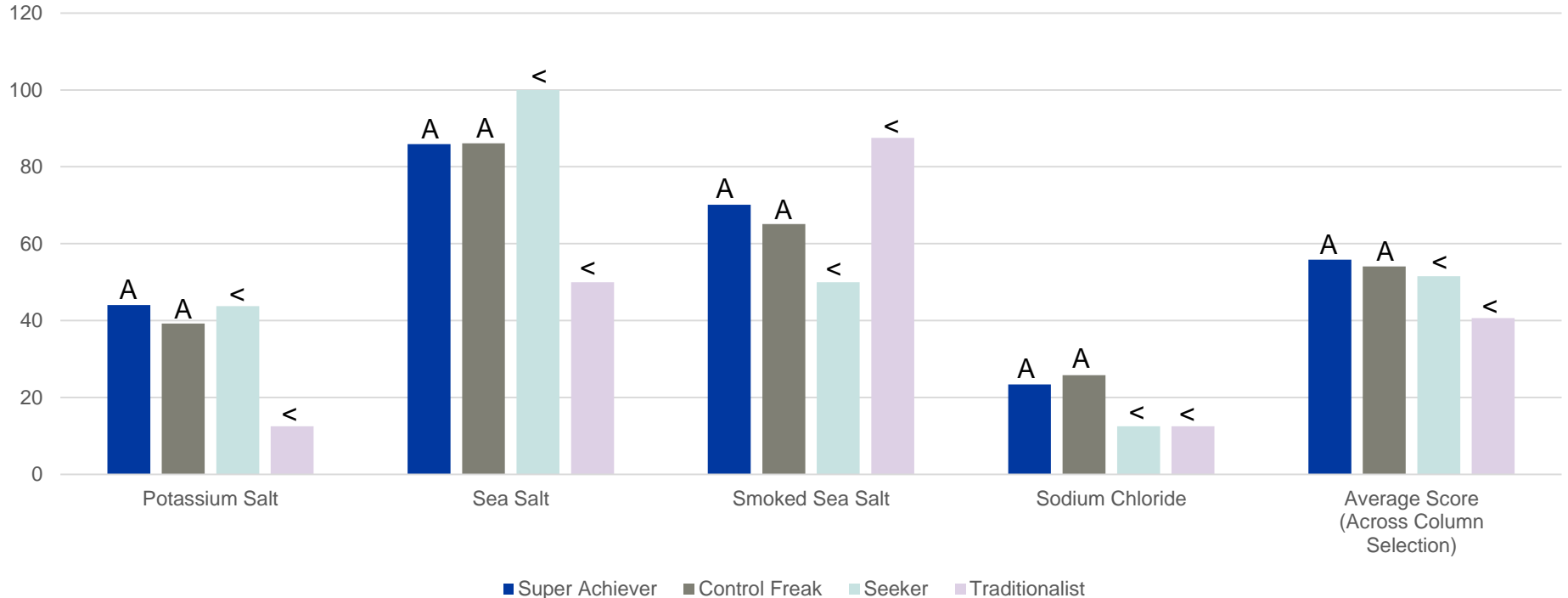
- Helps to identify white space in product portfolios

We Understand Macro Cues for Each Segment

Choice Increases Our Ability to Deliver Relevant Flavors

- By Brand

- vs. Occasion or Need
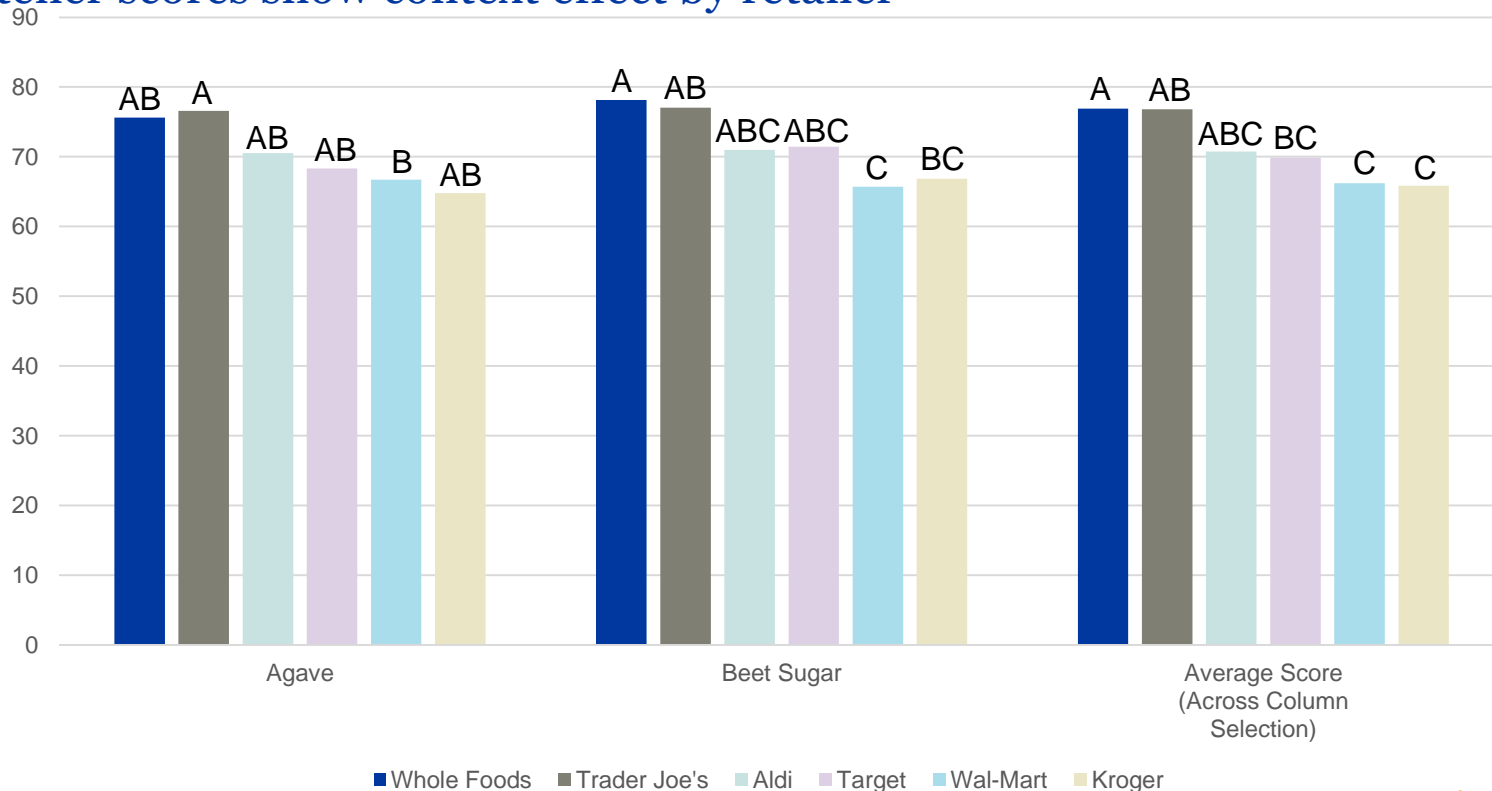
Salts by IFF Choice™ Segment

Scores show no context dependency by IFF Choice™, mostly Super Achievers and Control Freaks

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The acceptability of an ingredient may change, based on the context of shopping habits/preferred **retailer**.

Sweeteners by Retailer

Sweetener scores show context effect by retailer

Legend: Whole Foods, Trader Joe's, Aldi, Target, Wal-Mart, Kroger

Categories: Agave, Beet Sugar, Average Score (Across Column Selection)

Key Takeaway

Assessing **sys 1/sys 2** thinking and controlling for **context** in the research design adds a new dimension of insight that can help companies make **better clean label decisions**

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International Flavors & Fragrances Inc.

Beautiful answers start with brave questions.

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