

Measuring CPG Variability for Improved Product Matching

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Renewed Thinking about Controls



Reasons for Wanting a Match

- Alternate Supplier
 - ❖ Ingredients
 - ❖ Co-manufacturer
- Ingredient Substitution
- Process/Equipment Change
- New Plant or Line
- Match to National Brand (NBE)

Match to What?

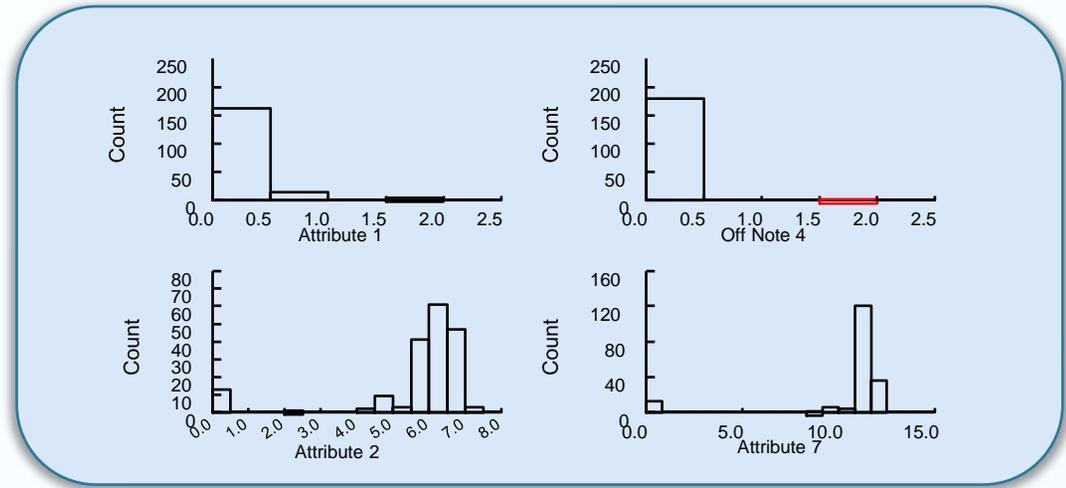


The Match to the Control!!!



Measuring Control

■ Attribute Histograms



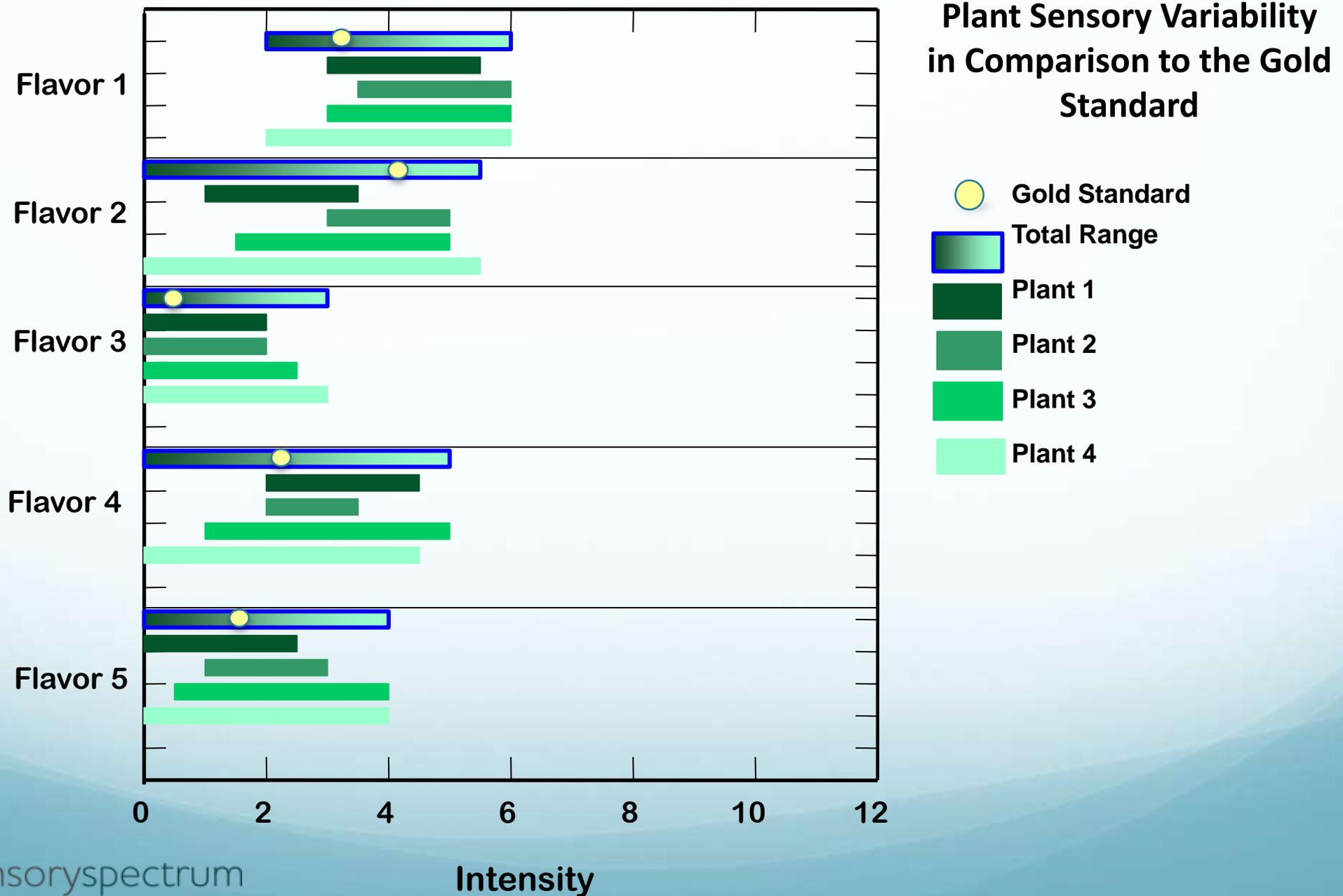
■ DOD Scales

No Difference		Very Slight		Slight		Moderate		Large		Very Large Difference
0	1	2	3	4	5	6	7	8	9	10

■ Descriptive Analysis

	Lot 1	Lot 2	Lot 3	Lot 4
Aromatics				
Tomato Paste	3	3.7	4.2	3.5
Vinegar - White	2.5	2.5	2.5	2.5
Smoky	2	2	2	2
Sweet Aromatic Complex	6.5	6.5	6.5	6
caramelized	0	0	0	0
honey	2	4	4	3.5
molasses	5	2.5	2.5	2
refiners syrup	0	0	0	0
Brown Fruit-prune/raisin	0	0	0	0
Dehydrated				
Onion/Garlic	3.5	3.5	3.5	3
Spice Complex	4.5	5	5	4
black pepper	3	4	4	3
cayenne	1.5	1	1	1

Measuring Control



Case Study 1: Barbecue Sauce



Case Study:

You produce a barbecue sauce that is a component for several of the ready to cook meat items your company sells.

A new procurement manager is hired who wants to use the lowest cost source for all ingredients.

R&D develops new formulations and hands them over to Sensory. The products fail internal discrimination.

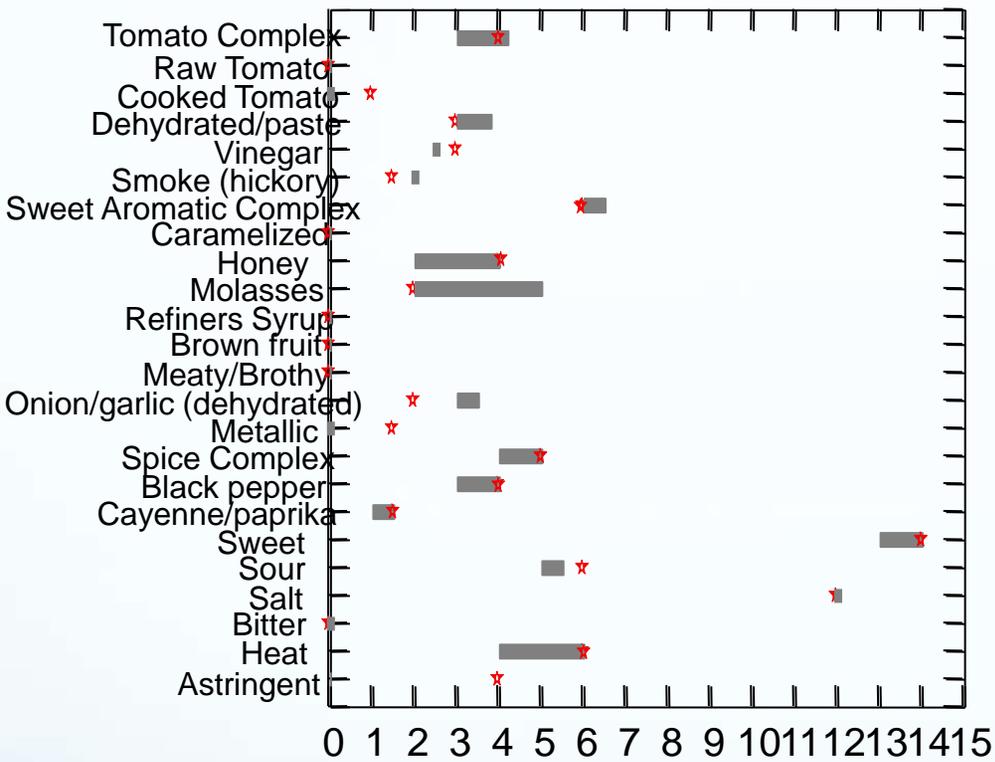
To better understand 1) the reasons for failure and 2) how to improve, the samples are submitted for descriptive analysis.

Case Study 1: Barbecue Sauce

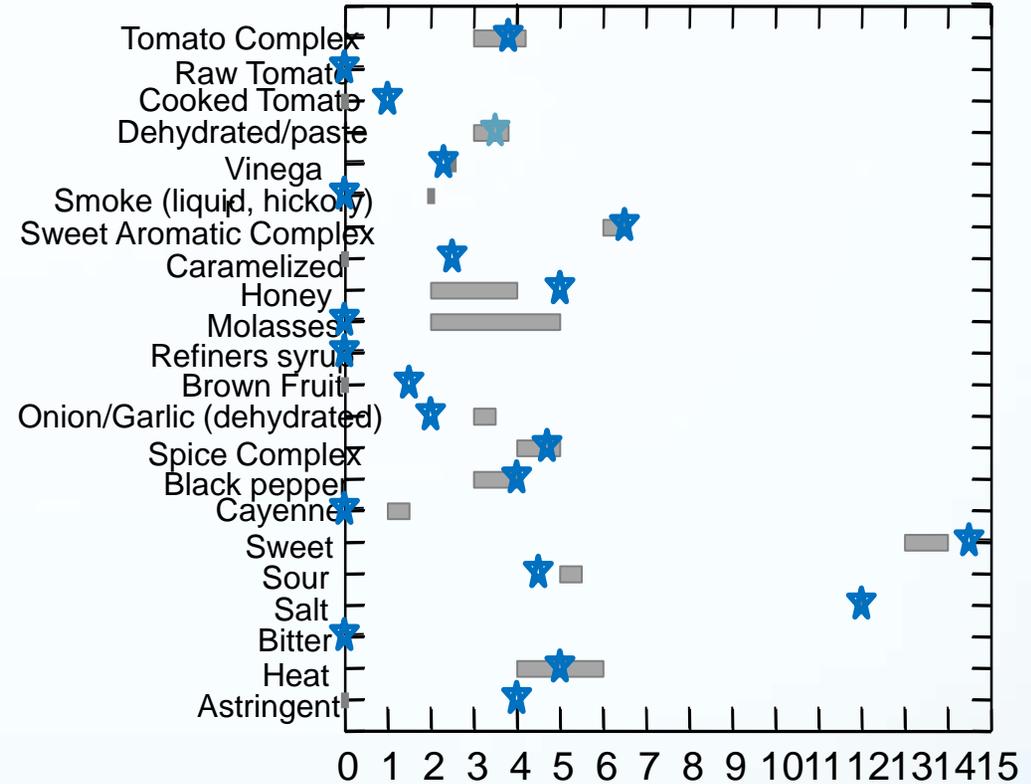
	Current Production				Test Batch #1	Test Batch #2
	Lot 1	Lot 2	Lot 3	Lot 4		
FLAVOR ATTRIBUTES						
Aromatics						
Tomato Paste	3	3.7	4.2	3.5	2.5	4
Vinegar - White	2.5	2.5	2.5	2.5	3.5	2
Smoky	2	2	2	2	0	0
Sweet Aromatic Complex	6.5	6.5	6.5	6	5	5
caramelized	0	0	0	0	2	0
honey	2	4	4	3.5	0	2.5
molasses	5	2.5	2.5	2	0	0
refiners syrup	0	0	0	0	3	2.5
Brown Fruit- prune/raisin	0	0	0	0	5	0
Dehydrated Onion/Garlic	3.5	3.5	3.5	3	3	1.5
Spice Complex	4.5	5	5	4	2	3
black pepper	3	4	4	3	2	3
cayenne	1.5	1	1	1	0	0
Basic Tastes						
Sweet	13	14	14	14	12	12.5
Sour	5.5	5.5	5.5	5	4	5.5
Salt	12	12	12	12	11	12
Feeling Factors						
Heat	6	6	6	4	4.5	6
DOD FLAVOR FROM CONTROL SPACE	--	--	--	--	7.5	5.5

DOD Scale anchors: 0 = no difference 5 = noticeable difference 10 = extreme difference

Case Study 1: Barbecue Sauce



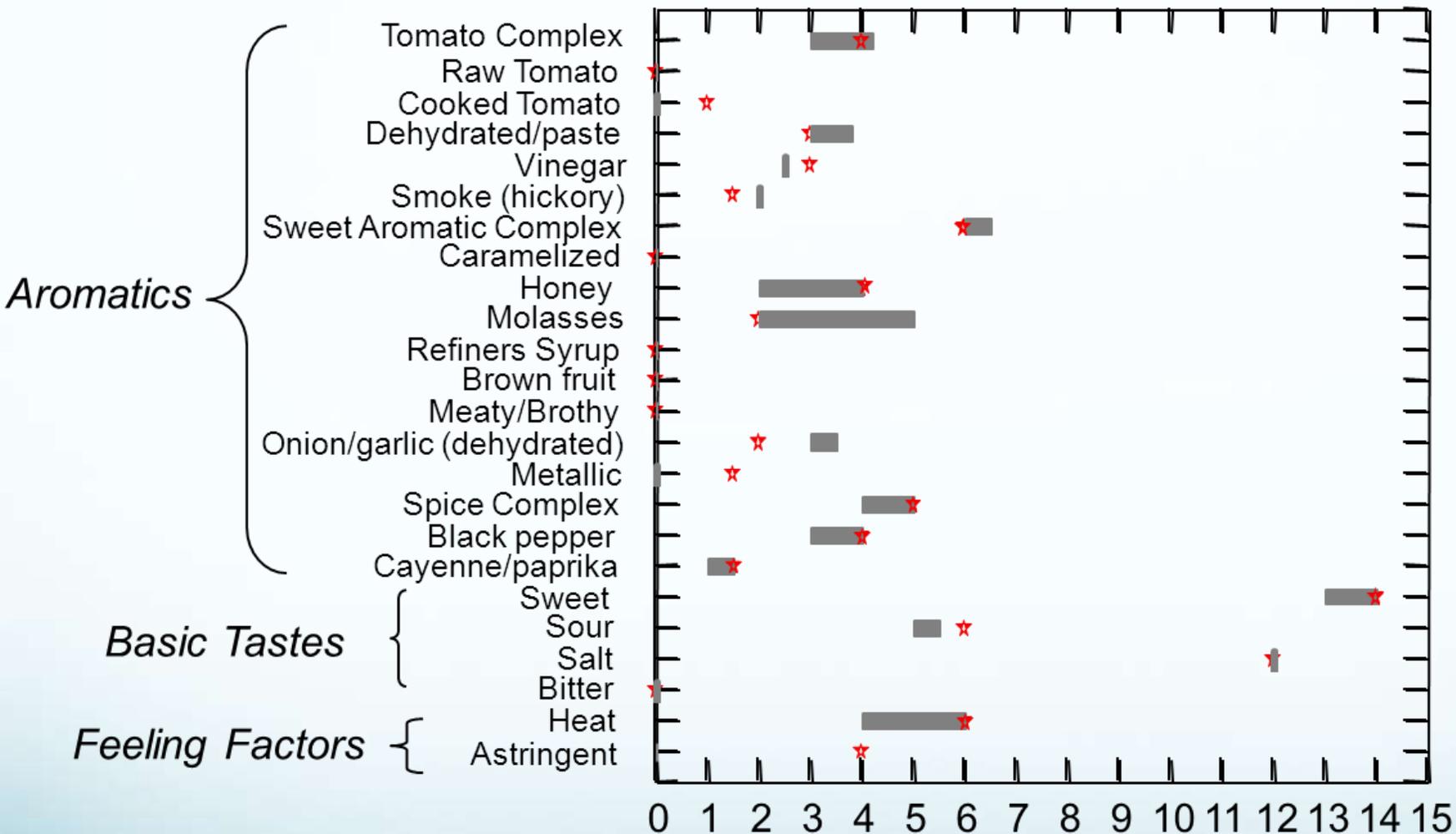
Intensity (0-15 pt scale)



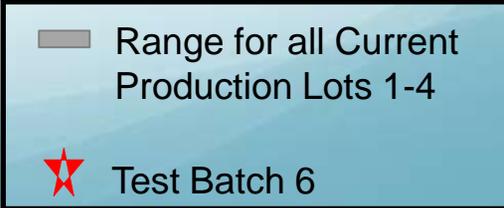
Intensity (0-15 scale)

After 6 submissions →

Case Study 1: Barbecue Sauce



Final DOD = 2



Case Study 2: Vanilla Extract

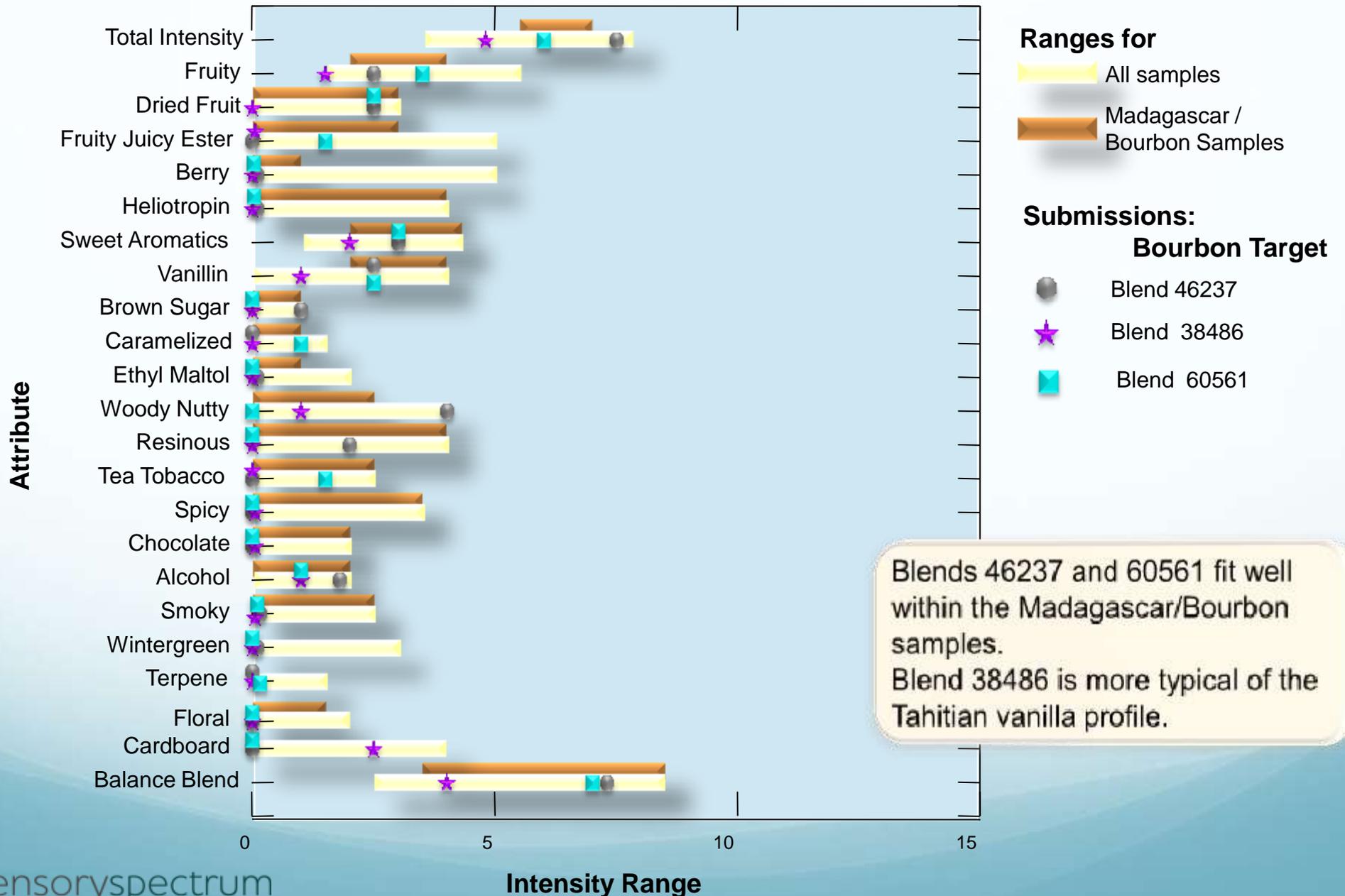
Case Study:

You are a producer of high quality vanilla extracts and purchase beans from all commercially viable equatorial growing regions.

Despite the good relationships you build with your suppliers, bad weather, armed conflicts, and sometimes unfriendly governments make keeping the needed volume of your Bourbon type beans virtually impossible. How can you maintain your sensory quality and keep your customers happy?



Vanilla Extracts - Flavor



Case Study 3: Buttery Cracker



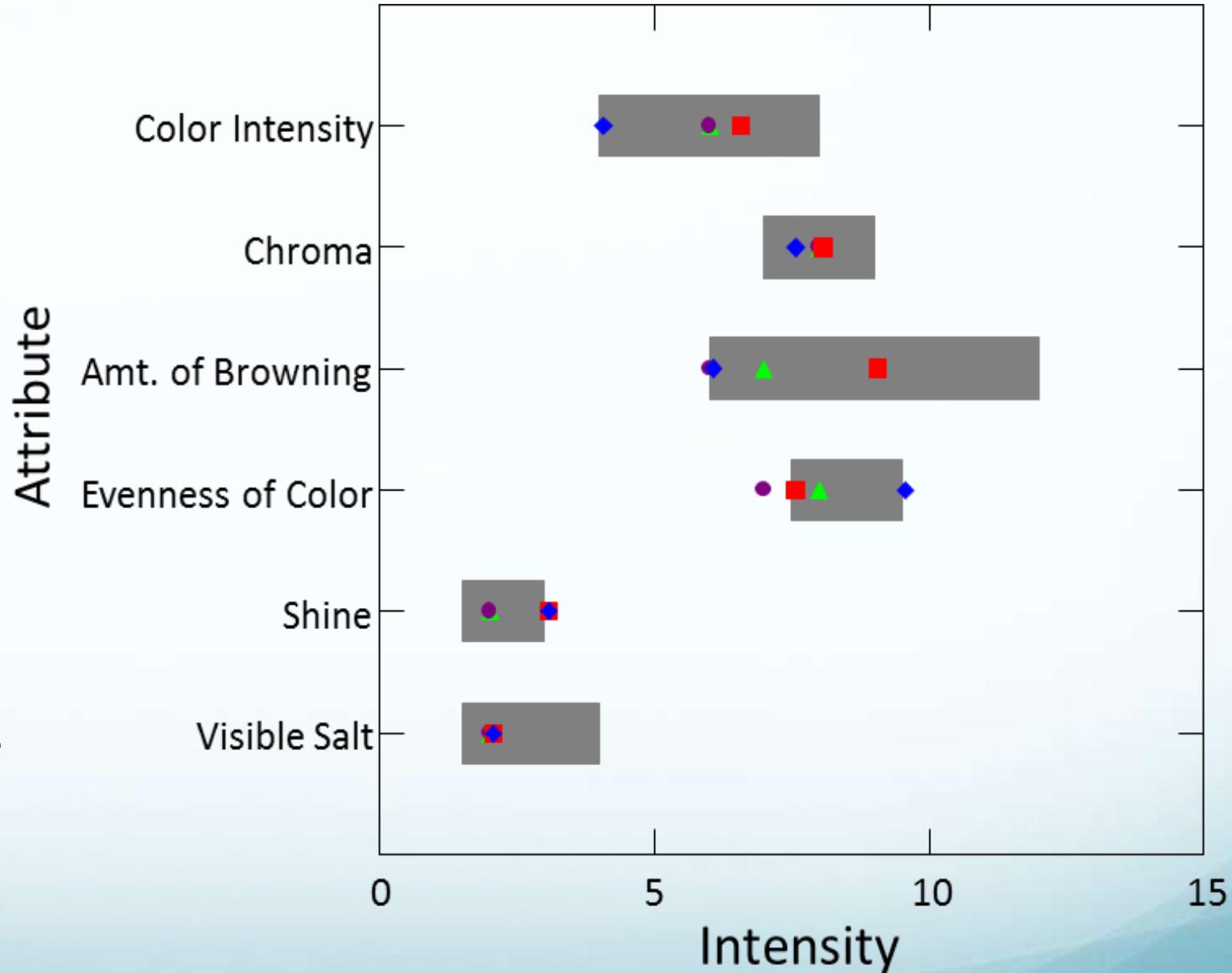
Case Study:

Your company has the opportunity to produce a buttery cracker for a major supermarket chain. The chain has told you the National Brand target but has not provided any samples for comparison. You purchase the crackers locally and get to work.

After hard work and successful internal testing, you fly to the client's HQ and submit your submission for review. You don't pass. You submit again. You don't pass. You submit a third time. Sigh. Finally, you taste the control they are using..... and it's not like the control you've been modeling for your product.

What can you do?

Buttery Cracker - Appearance



■ National Brand Range

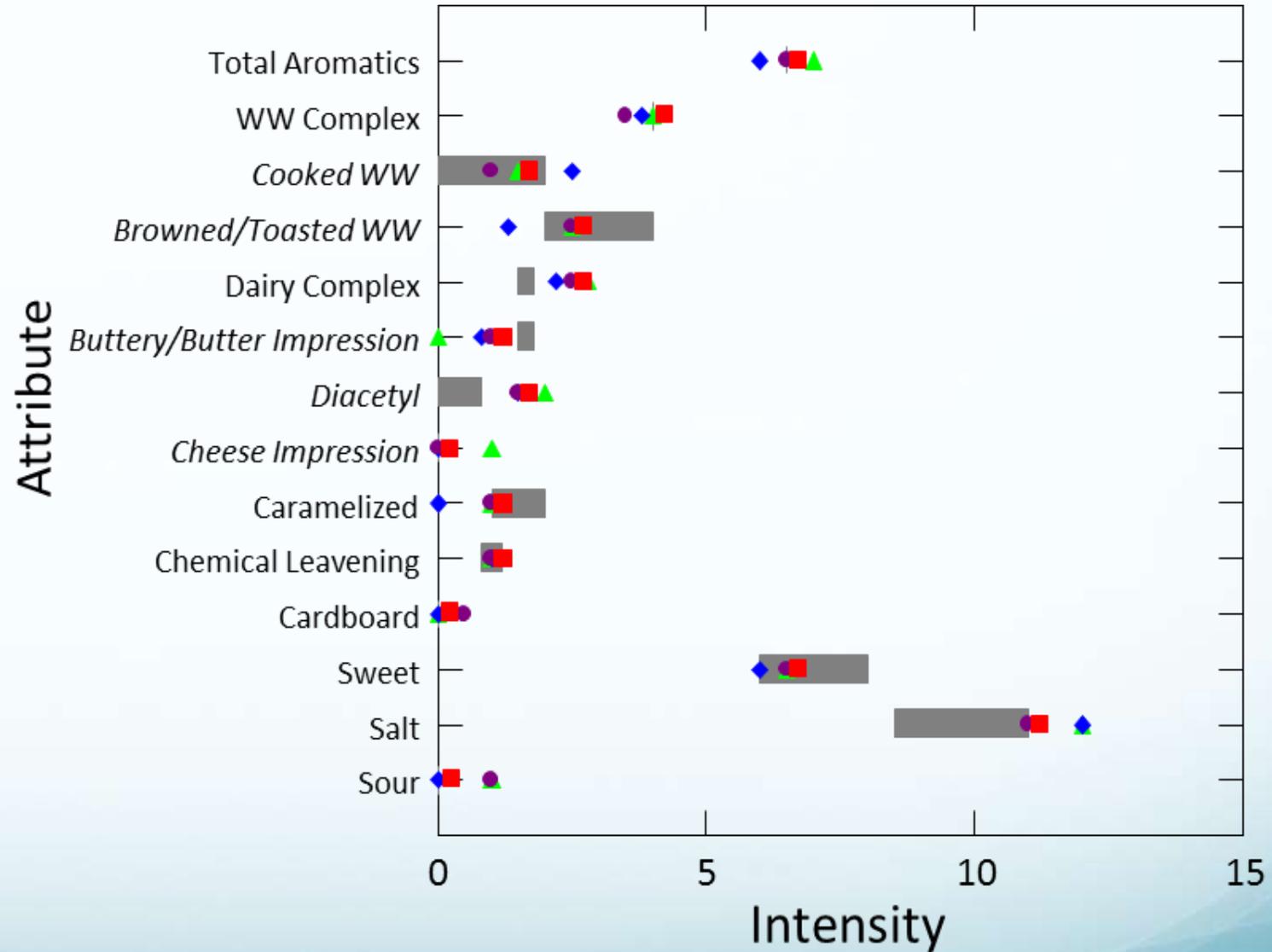
▲ Control used for Test

● Submission 1

■ Submission 3

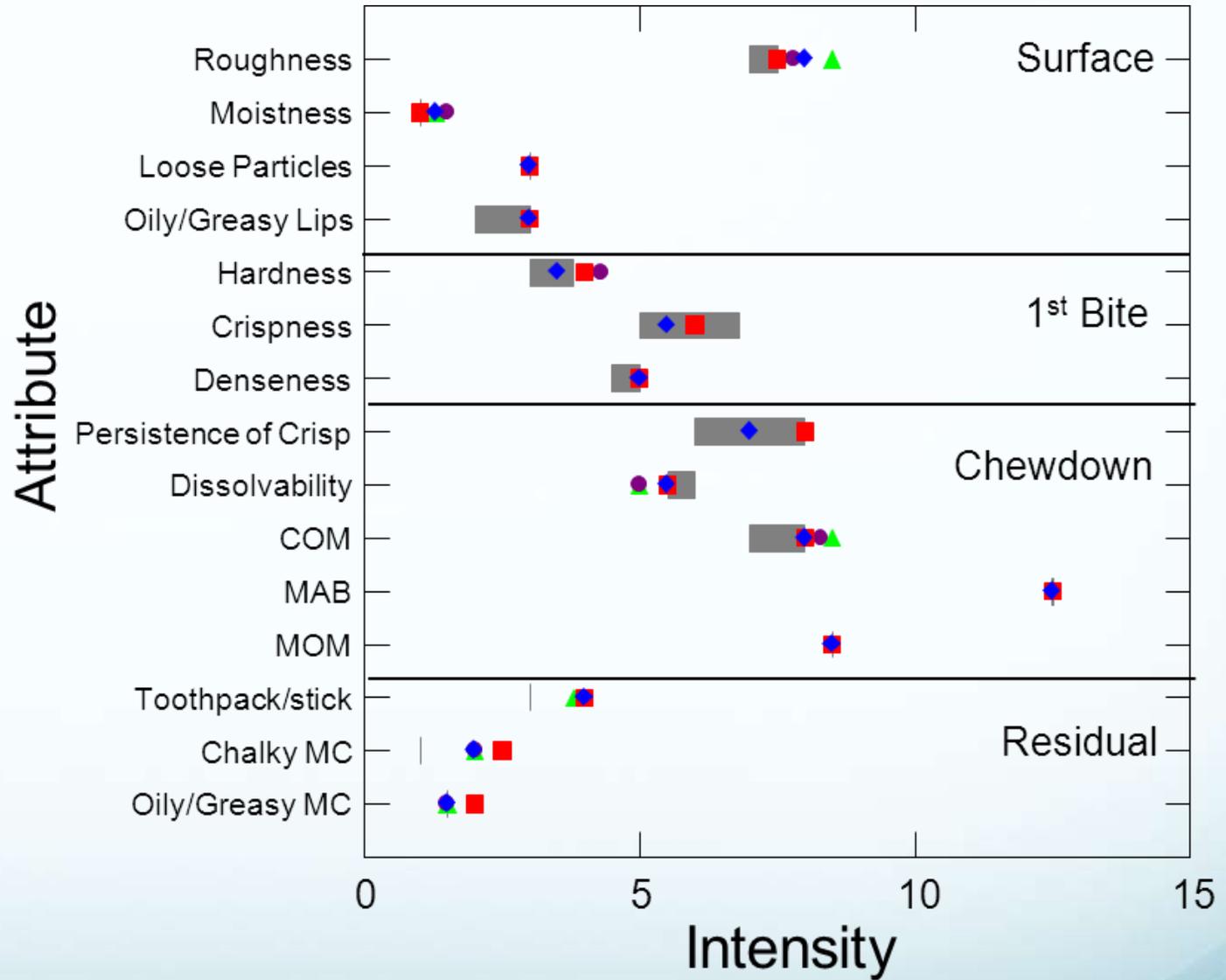
◆ Submission 2

Buttery Cracker - Flavor



-  National Brand Range
-  Control used for Test
-  Submission 1
-  Submission 3
-  Submission 2

Buttery Cracker - Texture



■ National Brand Range

▲ Control used for Test

● Submission 1

■ Submission 3

◆ Submission 2

MAB = Moisture Absorption
 MOM = Moistness of Mass
 COM = Cohesiveness of Mass
 MC = Mouthcoat

Buttery Cracker – Recommendations

DOD = 3.5	Differences from NB Space (8 lots)	To move Submission closer to NBE Space
Appearance	<ul style="list-style-type: none">• Within range for appearance	<ul style="list-style-type: none">• No changes necessary
Flavor <small>(main contributor to DOD)</small>	<ul style="list-style-type: none">• Butter character is both butter-like and diacetyl	<ul style="list-style-type: none">• Reduce diacetyl notes and increase butter-like notes
Texture	<ul style="list-style-type: none">• Slightly higher residual mouthcoating	<ul style="list-style-type: none">• Reduce chalky and oily/greasy mouthcoating

AND

**Show NB Space Data to Client to Demonstrate
Product Variability and Match to Space**

The Moral?

Don't Cut Corners in Understanding Your Control!

