



The Sensory Methodology Selection Matrix

Mapping the questions product teams ask to the methods, standards and statistics that answer them.

A ten-row master matrix from discrimination and descriptive testing to TDS, JAR penalties, preference and shelf-life designs – plus selection heuristics and the statistical map from data structure to analysis.

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Method mappings

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Discrimination tests

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Decision filter

ISO 13299

ISO 4120

ASTM MNL63

ISO 11136

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Purpose. Most sensory program waste is methodological, not statistical: the right analysis on the wrong method, or the right method answering last year's question. This guide maps the questions product teams actually ask to the discrimination, descriptive, temporal, and affective methods that answer them, with the governing standard, panel requirement, and primary statistical output for each.

About this document

This technical whitepaper is published by BioSensory Pte Ltd (Singapore), exclusive distributor of FIZZ Sensory Analysis Software (Biosystèmes, France) across Southeast Asia and Greater China. Internal benchmark figures reflect aggregated, anonymized results from APAC customer deployments and BioSensory pilot studies.

Worked examples are illustrative and clearly labeled as such. It is provided for professional education; it does not replace the cited ISO/ASTM standards.

1. The Master Matrix

Business question	Method	Standard	Panel	Primary output
Did the supplier change alter the product?	Triangle / unspecified tetrad	ISO 4120 / ASTM E3009	25-80 screened	Difference verdict + power
Is the new process less bitter?	2-AFC / 3-AFC on attribute	ASTM E2167-class practice	20-60 screened	Directional difference, d'
What defines the sensory identity of the winner?	QDA descriptive profile	ISO 13299	10-14 trained (ISO 8586)	Attribute means + ANOVA
Which attributes drive liking?	QDA + consumer regression (PLS)	ISO 13299 + internal	Both panels	Driver weights (preference map)
When during consumption does defect X appear?	TDS / TCATA	ISO 13299 temporal guidance	10-12 trained	Dominance curves (TDS)
Which attribute should we fix first?	JAR penalty analysis	ASTM MNL63	n ≥ 100 consumers	Mean-drop penalties
Do consumers prefer A or B, and by how much?	Paired preference + 9-pt liking CLT	ISO 11136	n ≥ 100 per market	Preference %, mean liking
Is batch B equivalent to control?	Equivalence-design discrimination (2 one-sided tests)	Internal QA SOP	Per power table	Equivalence verdict
How does liking evolve over shelf life?	Storage CLT series + survival analysis	ISO 11136	Per time point	Sensory shelf-life estimate
Why do markets disagree about the same product?	Multilingual verbatim NLP + descriptive recheck	ISO 5492 mapping	Verbatims + QDA	Market-specific driver briefs

Table 1. Business question to method mapping. Every row assumes samples coded, randomized, and served under ISO 8589 conditions.

2. Discrimination Methods at a Glance

Method	p_0	Choose when	Watch out
2-AFC	1/2	Directional question on one attribute	Requires knowable direction
3-AFC	1/3	Directional, attribute detectable among 3	Higher cognitive load
Triangle	1/3	Overall difference, 3 samples practical	Insensitive for large n savings
Duo-trio	1/2	Difference vs. a known reference	Less powerful than triangle
Unspecified tetrad	1/3	Overall difference, maximal efficiency	4 samples = more fatigue per set

Table 2. Selection heuristics for forced-choice discrimination (see the companion whitepaper on Thurstonian efficiency for sample-size tables).

3. Statistical Map

Data structure	Question	Analysis
QDA means, products x attributes	Which products differ, on which attributes?	2- or 3-way ANOVA with product, panelist, interaction; post-hoc LSD
QDA product profile	How do products organize in toto?	PCA on product-by-attribute matrix
QDA + hedonic	Which attributes drive liking?	PLS / external preference mapping
TDS sessions	Dominance sequences	TDS curves, standardized between-panel comparisons
JAR + liking	What to fix, which direction	Mean-drop penalty analysis
Discrimination counts	Difference verdict + effect size	Exact binomial critical values; Thurstonian d'

Table 3. From data structure to analysis. All outputs are one-click reports in FIZZ Calculations.

The one-question filter

Before commissioning any test, write the sentence the final slide must say: 'Consumers cannot tell the difference (n = 54, power 0.8)' or 'Reducing sugar by 30% costs 0.4 liking points, driven by mouthfeel.' If the sentence cannot be written, the method is not chosen yet.

References

- [1] International Organization for Standardization (2016). ISO 13299:2016 Sensory analysis - Methodology.
- [2] International Organization for Standardization (2021). ISO 4120 Sensory analysis - Triangle test.
- [3] American Society for Testing and Materials (2015). ASTM E3009-15 Tetrad Test.
- [4] American Society for Testing and Materials (2009). ASTM MNL63 JAR Scales manual.

- [5] International Organization for Standardization (2014). ISO 11136 Hedonic tests with consumers in a controlled area.
- [6] Meilgaard, M.C., Civille, G.V., and Carr, B.T. (2015). Sensory Evaluation Techniques, 5th ed. CRC Press.