

Culinary Ranking Stability: Separating Weight Effects from Measurement Uncertainty

A research protocol proposed by Ahmad Issam Maadarani

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This proposal tests how rankings depend on criterion weights and measurement variation, keeping these sources separate. A difference may persist across weights yet remain sensory-unresolved, or the reverse. The aim is an auditable sensitivity report, not retrospective weight changes or engineering a desired ranking.

1. Research problem

Consistency and scale use are existing research topics [S]. Culinary rankings nevertheless combine a normative choice—attribute weights—with imperfect measurements. The proposed contribution is a two-level analysis separating ranking changes under prespecified acceptable weights from changes when measurements are re-estimated. It is a culinary application, not a claim to have invented sensitivity analysis.

2. Two kinds of change

In a hypothetical comparison, one formulation excels in texture and another in balance. Changing their order by increasing texture's weight reflects a changed definition of success, not necessarily sensory error. A change after repeated measurement with fixed weights may involve sample, assessor or preparation. Combining both sources into a single winning-stability percentage can conceal whether the remedy concerns task criteria or measurement quality.

3. An acceptable weight domain

Define exploratory weight sets before inspecting results, explaining their limits. In an existing competition, official weights still determine the decision; alternative analysis explains sensitivity without replacing the result. When developing criteria, compare candidate weights and choose according to a declared purpose, then validate using new data. Do not choose a domain solely because it preserves a preferred dish's victory.

4. Checking aggregation meaning

Adding scores assumes a meaningful combination. Numbers alone do not ensure this where scales are ordinal or descriptors overlap. Review direction, units and transformations for each criterion. An imposed point total can be described as a decision rule, not a pure natural measurement of food quality. Equal distances between scale levels must not be assumed without justification.

5. Repetition and analysis

Collect preparations, sessions and assessors appropriate to the aim. Specify dependence before selecting uncertainty estimation. Resampling, if used, must preserve relevant preparation or cluster units; independently resampling every bite can overstate confidence. A suitable measurement model is another possibility. This article prescribes neither one mandatory statistical method nor a stability percentage guaranteeing universal validity.

6. Reporting without exaggeration

Show the official-weight ranking, a map of changes within the exploratory domain, and measurement uncertainty under fixed weights. Ties or unresolved positions may be preferable to a single rank. The proportion of chosen weight sets in which a dish leads is not the probability it is genuinely best; it describes those sets. A probability distribution over weights requires justification and disclosure of its influence.

7. Critical examination

A report fails to help if readers cannot tell which source changed the ranking. Its proposed value is weakened if the sensitivity map itself changes substantially in new preparations. Reconsider descriptors or measurement repetition while preserving the original result. The professional goal is to understand decision boundaries and potential changes, not surround one number with calculations suggesting unavailable certainty.

8. References and limits of source use

References support the stated background. Proposed protocols and hypothetical cases are not findings attributed to those studies.

[S] Sipos, L., Ágoston, K. C., Biró, P., Bozóki, S., & Csató, L. (2023). How to measure consumer's inconsistency in sensory testing?. Preprint, arXiv:2312.08141.

<https://arxiv.org/abs/2312.08141>

Source use: preprint abstract; this link does not establish peer-review status.

9. A concise working sheet

Field	Review question	What to record
Weights	Did the definition of success change?	Prior domain and official weights.
Measurement	Did the observations change?	Batches, dependence and estimation.
Language	What does a leading proportion mean?	Sensitivity description, not absolute superiority probability.

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