

A Neurobiologist's Perspective on the Art of Tiramisu

Chao Sun^{1,2,3} *, Copilot (AI agent)

¹ Danish Research Institute of Translational Neuroscience (DANDRITE)- Nordic EMBL Partnership for Molecular Medicine

² PROMEMO- DNRF Center of Excellence

³ Department of Molecular Biology and Genetics, Aarhus University

Introduction:

Tiramisu has evolved from its humble, restorative origins into one of Italy's most iconic desserts. Its history traces back to the Veneto region in the late 1960s and 1970s, where chefs combined mascarpone, coffee-soaked ladyfingers, cocoa, and sugar into a balanced, layered creation whose name, *tirami sù*, literally means “pick me up.” Earlier forms—including *sbatudin*, a mixture of egg yolks and sugar historically used as an energizing food—also emphasized the uplifting, restorative nature that would later become central to tiramisu's identity.

In parallel with this culinary evolution, neuroscience research has increasingly illuminated how humans perceive food. Sensory evaluation relies on interconnected neural pathways for touch, taste, olfaction, reward, memory, and emotional significance. Tiramisu resonates across all of these systems. Its structure, aroma, and flavor profile engage multisensory integration in the orbitofrontal cortex, while its “pick-me-up” character aligns with brain systems governing reward, arousal, and affect.

Inspired by these ideas, the Sun lab, a local cohort of neurobiologists who are not only passionate about neuronal synapses—curious brain structures that are invisible to the naked eye—but also food, investigated the local competence in tiramisu making as well as the physiological limit of tiramisu uptake during our 3-year lab anniversary. The four criteria used in the Sun Lab Tiramisu Competition—**Texture, Flavor Balance, Respect for Tiramisu Philosophy, and Creativity**—are not only historically grounded but also reflect core neurobiological dimensions of human food perception. Using these four criteria, we evaluated ten Tiramisu entries from the local neurobiology community at Aarhus University. While we identified a clear winner based on jury scores, several entries are consistently high performers across all criteria with statistically insignificant differences from the entries with the highest scores. Unpleasant physiological responses were also reported upon overconsumption of Tiramisu.

Results:

To reveal the best Tiramisu in the 2026 Tiramisu competition, we evaluated 10 Tiramisu preparations from 10 individuals or teams that are affiliated with DANDRITE. These ten tiramisus include

- 1) **Tea-ramisu:** mascarpone cheese, black tea, coco powder, lady finger, egg, sugar, soya milk, rum, lemon zest
- 2) **Vanilla Tiramisu:** Cacao, mascarpone, lady fingers, coffee, eggs, vanilla
- 3) **The BBB Tiramisu:** Ladyfingers, coffee, mascarpone, egg yolks, sugar, cocoa powder, chocolate, red food color
- 4) **Tiramisu Primavera:** mascarpone, heavy cream, sugar, eggs, green tea, elderflower concentrate, lemon raspberries
- 5) **White Russian Tiramisu:** Cream cheese, mascarpone, lady fingers, sugar, coffee liquor, coffee, heavy cream
- 6) **All Roads Lead to Tiramisu:** Mascarpone cheese, eggs, sugar, lady fingers, coffee, cocoa powder, dark chocolate
- 7) **Tiramisu Piemontese:** Lady fingers, moka-made coffee, egg yolks sugar, mascarpone, cream, milk, home-made pesto with hazelnuts from Piemonte, lemon zest, vanilla paste, dark chocolate, cocoa powder
- 8) **Lift me Up:** Egg, salt, sugar, coffee, lady finger, mascarpone, cocoa powder
- 9) **Almond Symphony:** Mascarpone cheese, egg yolks, granulated sugar, heavy cream, ladyfingers, espresso coffee, Disaronno Amaretto, almonds, cocoa powder, vanilla
- 10) **Speculoos Tiramisu:** Cinnamon, Cointreau, flour, sugar, pistachio, egg, mascarpone, coffee, chocolate, vanilla almond

The jury members were recruited randomly from the local community of neurobiologists, consisting of junior and senior researchers from multiple countries in Europe, Asia, and USA, including e.g. Master's level students, lab technicians, and full professors of biomedicine, who paid a substantial amount of money voluntarily for a major sugar-fest accompanied by alcohol. These human subjects evaluated Tiramisus based on four criteria outlined above.

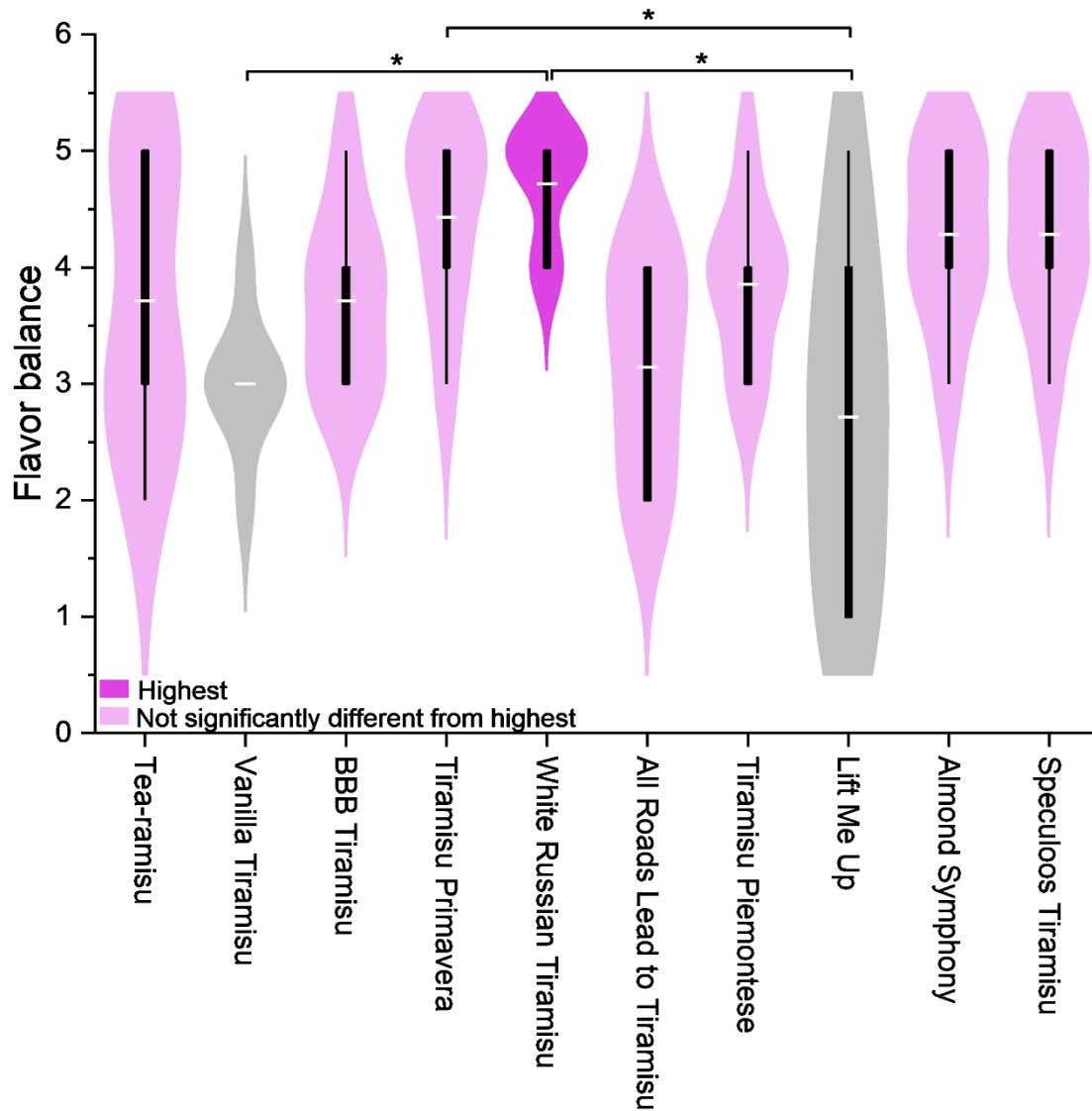


Fig.1 Violin plots of Flavor balance scores for ten Tiramisu entries. Dark magenta denotes the entry with highest average score. Light magenta denotes entries with scores that are not significantly different from the highest. 7 jury score replicates per group; One-way ANOVA ($p^* < 0.05$).

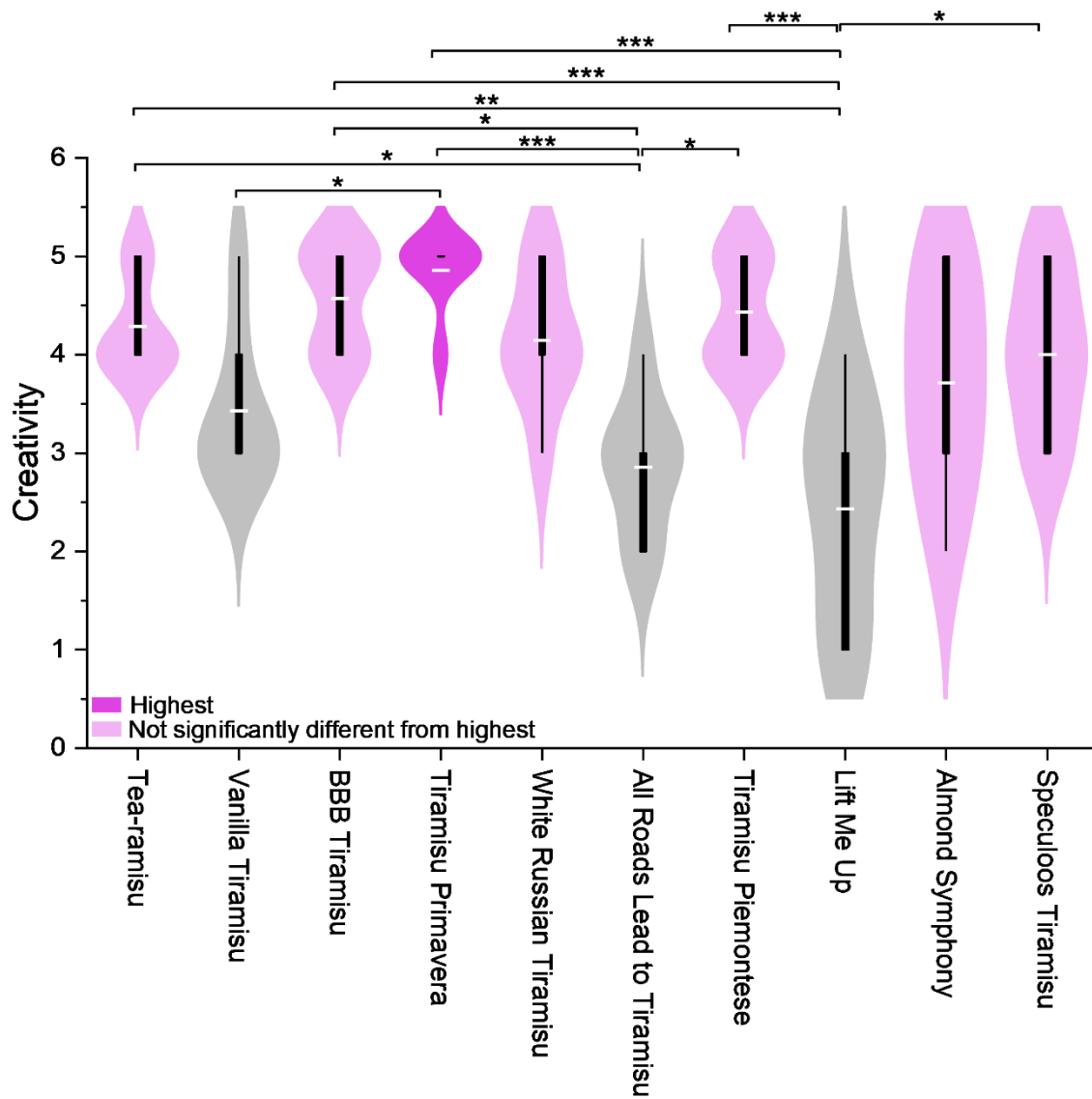


Fig.2 Violin plots of Creativity scores for ten Tiramisu entries. Dark magenta denotes the entry with highest average score. Light magenta denotes entries with scores that are not significantly different from the highest. 7 jury score replicates per group; One-way ANOVA ($p^* < 0.05$; $p^{**} < 0.01$; $p^{***} < 0.001$).

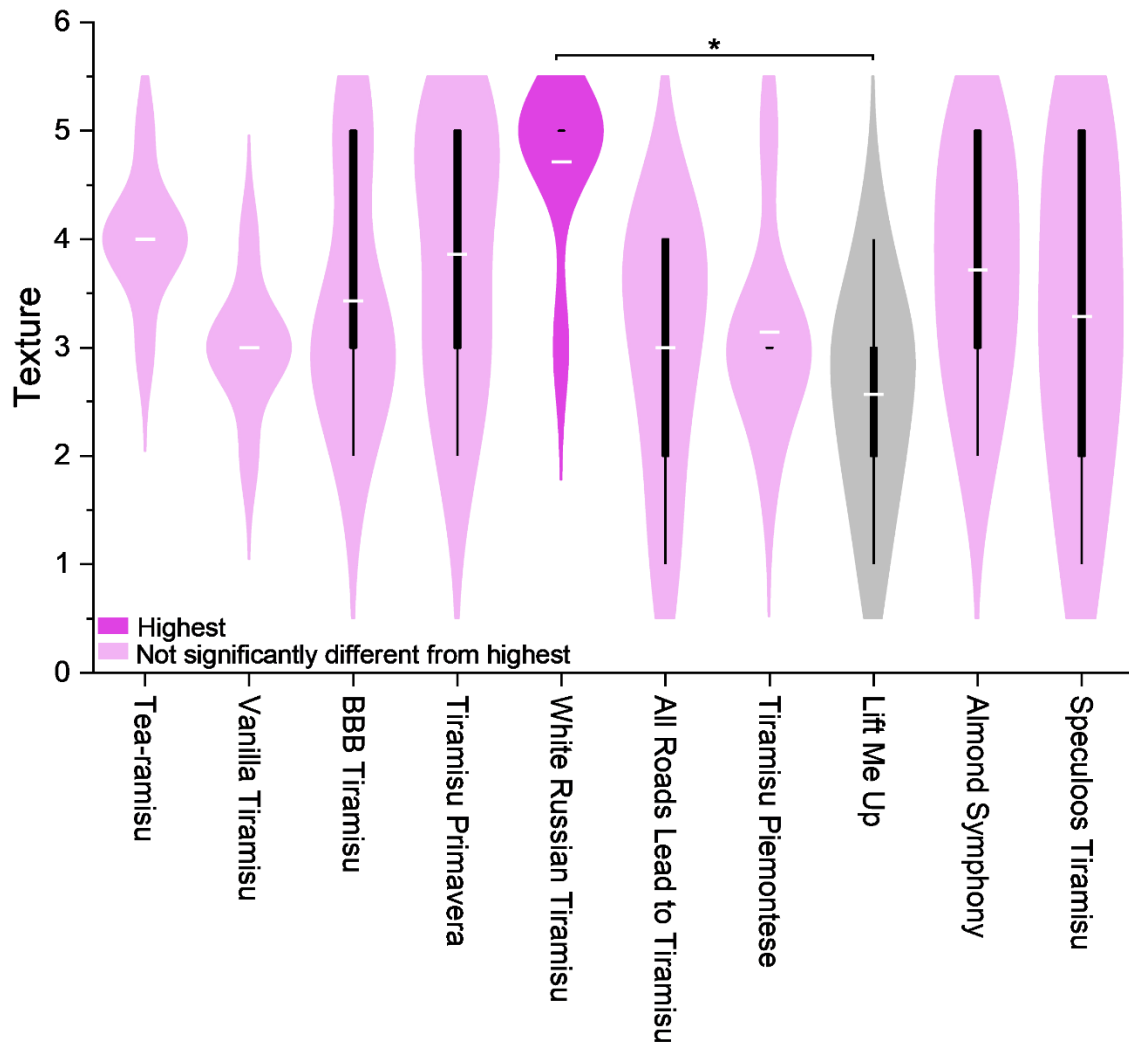


Fig.3 Violin plots of Texture scores for ten Tiramisu entries. Dark magenta denotes the entry with highest average score. Light magenta denotes entries with scores that are not significantly different from the highest. 7 jury score replicates per group; One-way ANOVA ($p^* < 0.05$; $p^{**} < 0.01$; $p^{***} < 0.001$).

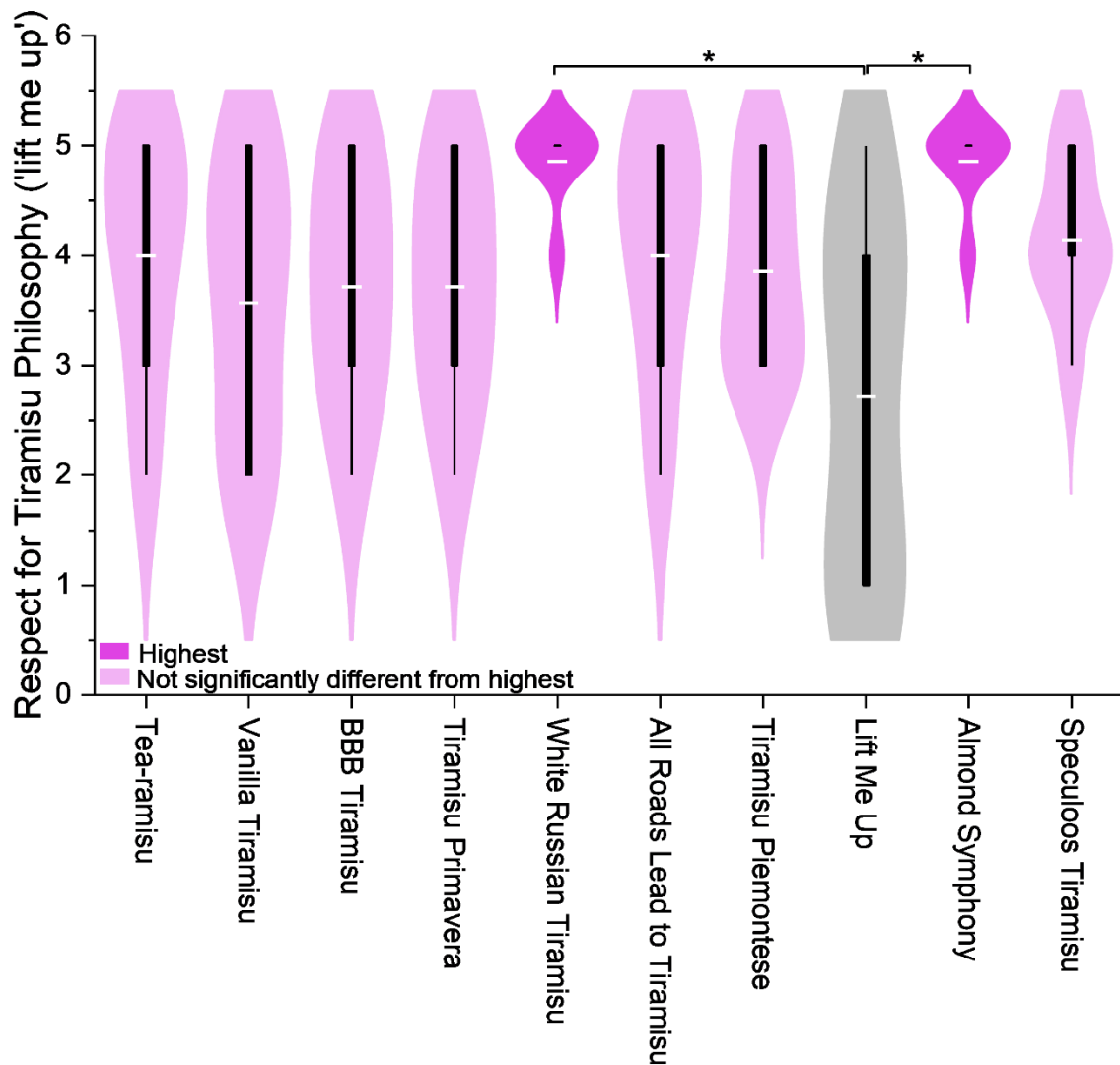


Fig.4 Violin plots of scores on Respect for Tiramisu Philosophy ('lift me up') for ten Tiramisu entries. Dark magenta denotes the entry with highest average score. Light magenta denotes entries with scores that are not significantly different from the highest. 7 jury score replicates per group; One-way ANOVA ($p^* < 0.05$; $p^{**} < 0.01$; $p^{***} < 0.001$).

Dark magenta in each graph denotes the entry with the highest average score in this category. Light magenta denotes entries that are not significantly different from the highest-scoring entry within each category. Across the four graphs, several tiramisu entries repeatedly fall into this light-magenta group. These entries are consistently top-tier (light magenta or above) in all four categories, including: Tea-ramisu, BBB Tiramisu, Tiramisu Primavera, White Russian Tiramisu, Tiramisu Piemontese, Almond Symphony, Speculoos Tiramisu.

Among these entries, Tea-ramisu, BBB Tiramisu, Tiramisu Piemontese, Almond Symphony, and Speculoos Tiramisu appear every time in the “not significantly different from the highest” group, indicating that although they do not have the single top (dark-

magenta) score, they consistently perform at a level statistically equivalent to the winner. In other words, their overall performance is extremely stable; they show no weak category; they are high-confidence podium contenders.

Amongst the winners of each category, White Russian Tiramisu wins 3 categories (Texture, Flavor Balance, Philosophy). Tiramisu Primavera won Creativity. Overall, the jury concluded that the winner is the White Russian Tiramisu. The runner-up is Tiramisu Primavera. Almond Symphony won third place. Alas, Italian contestants were nowhere to be found in the top three entries.

Finally, it was worth noting that unpleasant physiological responses were also reported upon second tastings of the same entry, possibly due to overconsumption. A general sense of euphoria and ecstasy was also detected in the room, likely due to high levels of blood glucose, worsened by carbonated alcoholic drinks

Discussion

The results of the 2026 Sun Lab Tiramisu Competition reveal intriguing lessons in how contemporary interpretations of tiramisu relate to its cultural and physiological roots. We note that this report was passionately written by a subset of contestants who did not win.

The dominance of White Russian Tiramisu across three of the four categories highlights the power of technical precision and adherence to traditional sensory cues. Its highest scores in Texture, Flavor Balance, and Respect for Tiramisu Philosophy suggest that it successfully captured and magnified the essential features that historically define tiramisu: a layered interplay of softness and structure, a rich bitter-sweet flavor profile, and an uplifting, energizing quality rooted in the dessert's origins. Tiramisu Primavera, in contrast, emerged as the winner in Creativity and maintained light-magenta standing across all categories. This consistent near-top performance highlights a different dimension of excellence: the ability to innovate without sacrificing the core identity that defines tiramisu. Several entries also achieved light-magenta ratings across all four dimensions, demonstrating exceptional consistency even without earning category-winning dark-magenta designations. These entries underscore the insight that a tiramisu can succeed through balance rather than dominance—a point that some contestants cannot emphasize more strongly. Their steady high performance reflects a harmonious integration of texture, flavor complexity, and adherence to the uplifting tiramisu philosophy while introducing novel but not disruptive creative elements.

We also note that the several jury members reported symptoms of nausea when they attempted a second tasting of the same entries, suggesting that their perception of the entries may be biased by the order of the tasting among the ten tiramisus. Entries with more traditional approaches to Tiramisu flavor profiles, often made by Italian

contestants, also did not stand out in the evaluation outcome, suggesting that the jury members may be biased toward modern interpretations. To control for this factor, a possible rematch may call on a pre-selected cohort of jury members in the future, as suggested by a certain passionate Italian contestant.

Taken together, the competition's outcomes highlight a central theme: tiramisu excellence arises from the intersection of tradition, modern interpretation, and sensory neuroscience, with potential confounding factors that might cause brief albeit noticeable discomfort for several contestants, who did not win. Alas, this outcome suggests that bitter sweet memories of the lab anniversary may linger more for some compared to others.