Would you try French fries with soy sauce?
Anticipated and experienced fit of traditional and novel condiment-food combinations.

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1. Introduction

With the increasing globalization, foods from other cultures such as Asian foods become available to western consumers. When unfamiliar foods are encountered for the first time, consumers are typically somewhat anxious to put the food in their mouths. Condiments with familiar flavors are often used by consumers to make these unfamiliar foods more acceptable (See 'References'). However, little is known about the mechanisms that consumers use to determine whether a condiment fits a specific food.

The aim of the study is to investigate how consumers judge the combination of a condiment and a specific food. Insights in these mechanisms may facilitate the integration of foods from different food cultures into a new food culture.

2. Method

	Study 1	Study 2	Study 3
N	**1002 (Dutch)**	**145 (Dutch)**	**59 (Dutch)**
% female	51.1	50.3	71.2
Age (M ± SD)	47.2 ± 15.9	43.7 ± 17.0	49.3 ± 18.5

Fig.1 The test flow of studies and participants' demographics.

In studies 1 and part 2 of this study, Dutch participants determined the fit between six condiments and a selection of 30 full meals and 30 meal components. The full meals were representative of northern European (n=10), southern European (n=10), and Asian food cultures(n=10). The meal components consisted of vegetables (n=10), protein sources (n=10) and carbohydrate sources (n=10). In the first on-line survey, 1002 participants judged the fit based on images and names of condiments and images of foods by binary choices of "Fit" or "Un-fit". In the second on-line study, 145 participants replicated the first study except that the condiment was not only shown and named, but also was tasted. The response time, Food Neophobia score, olfactory imagery status and familiarity and liking of the condiments were also investigated. Finally, the validity of the results from studies 1 and 2 was tested in a third study where 59 participants were presented in a laboratory with actual condiment-food combinations that were selected from the previous studies based on their relatively low and high fit ratio. The "Expected fit" (before tasting) and "Actual fit" (after tasting) was evaluated using a VAS-scale.

3. Results

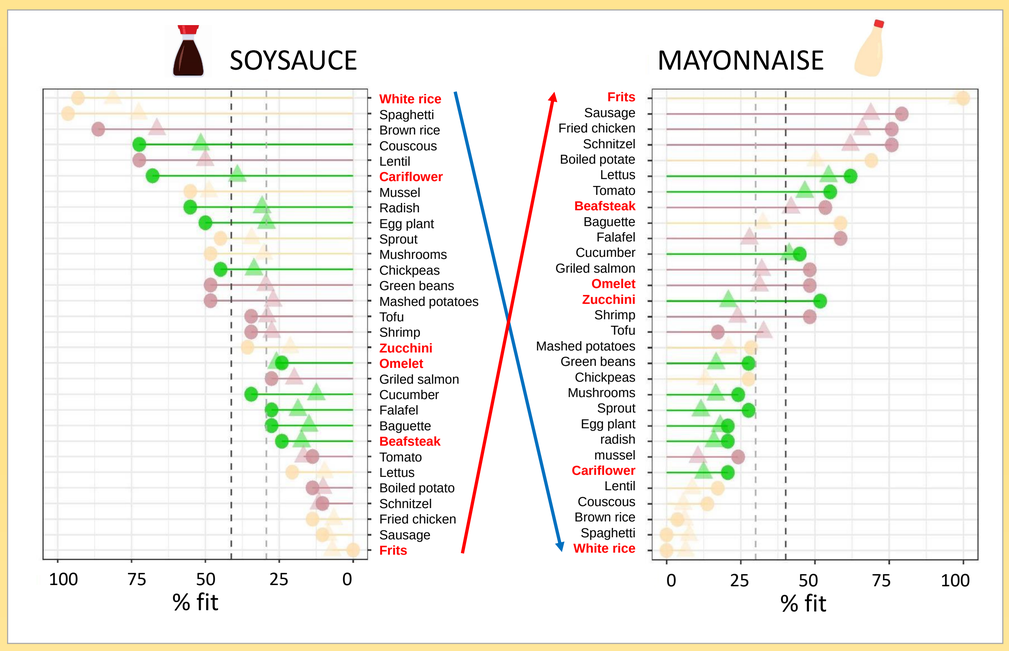

Fig.2 percentages fit across participants of combinations of each soy sauce (left) and mayonnaise (right) with meal components.
Triangles and circles represent the results of studies 1 and 2, respectively. The type of meal component is represented by colors (Green is vegetables; purple is proteins; beige is carbohydrates). Meal components shown in red were selected as the food dishes in study 3.

3. Results (continued)

Study 1 & 2

From online surveys, 27 percent of the condiment/food combinations were judged as fitting in study 1. This percentage increased to 35% when participants tasted the condiments in study 2. Fit responses increased with the participants' familiarity with and liking of the condiments for ketchup, mayonnaise, mustard and satah sauce, and decreased for sambal (hot sauce) and soy sauce. Response times averaged 1.56 (± 0.31) sec in study 1 and 2.42 (± 0.49) sec in study 2. Fit responses were not affected by the participants' Food Neophobia score or olfactory imagery score.

Regarding fit ratios of condiments and meal components, especially soy sauce and mayonnaise showed opposite patterns (Fig.2). For example, fits with white rice were low for mayonnaise and high for soy sauce, and vice verse fits with fries were high with mayonnaise and low with soy sauce.

Study 3

In study 3, steak, cauliflower, zucchini, French fried, omelet, and white rice were actually presented to participants with mayonnaise and soy sauce. From study 1 and 2, participants anticipated the combination of steak and soy sauce was low. However, after the actual tasting, they evaluated that the combination was better than their expectations (Fig.3). Especially steak, French fries and omelet was highly evaluated with soy sauce after tasting. However, French fries with mayonnaise and white rice with soy sauce was evaluated lower than the expectation.

Overall, anticipated and actual fit scores were positively correlated, but

1) fit scores were typically higher when the combinations were actually tasted instead of viewed.
2) Combinations with high anticipated fits resulted in lower fits when tasted.
3) Combinations with low anticipated fits resulted in high fits when tasted. Finally, fit scores correlated strongly with liking scores.

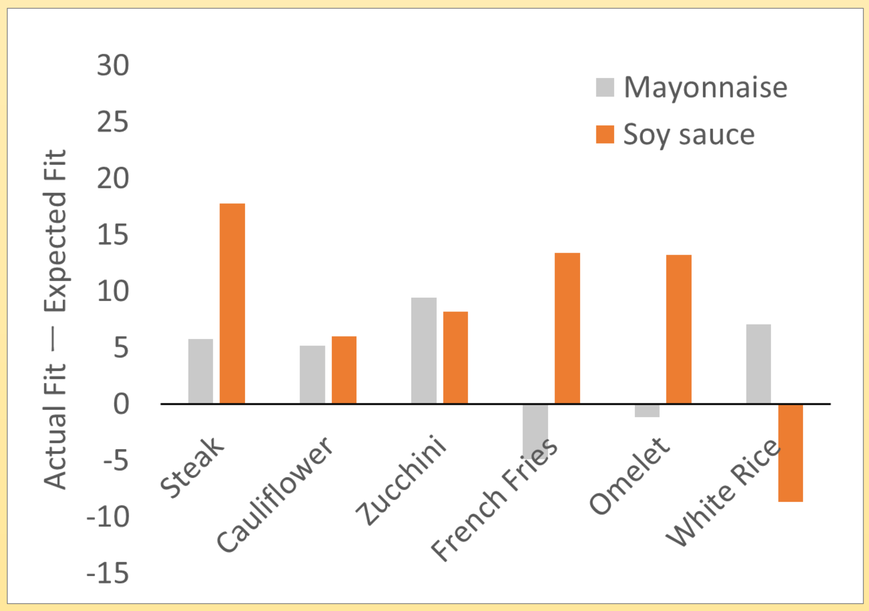

Fig.3 Fit responses of meal components with condiments.
Actual fit responses were evaluated using a VAS-scale (from 0 to 100). Participants answer fit ratios for each combinations when presented it (Expected fit) and after tasting (Actual fit).The scores calculated by dicreasing actual fit ratios from expected fit ratios.

4. Conclusion

The results showed that:

1) Overall, fit scores based on images of foods and flavors correlated with fit scores during actual tasting.
2) Participants underestimated the actual fit of food/flavor combinations when the fit was based on images of foods and flavors.
3) The mechanisms behind fit scores based on images and actual tasting may be partly different. Whereas familiarity with the flavor and food were significantly associated with the fit responses based on the images, familiarity was not associated with fit responses based on actual tasting.

In conclusion, the results demonstrate that food evaluations based on images can not completely replace food taste evaluations, even though both types of evaluations show commonalities.

5. Acknowledgements

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6. References

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