

How does flavor migration shape palatability in wet pet food?

Research shows the impact of adding a palatant to just one part of a chunks-in-gravy recipe.



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In multi-matrix formats such as chunks-in-gravy (CIG), a palatant may be added to either the chunks or the gravy to enhance the taste of that component. However, the effect often extends beyond the targeted matrix, influencing the overall flavor profile.

Understanding flavor distribution

To better understand how palatants influence flavor perception, six wet pet food palatants were evaluated in a CIG cat food model, generating six recipes that differed only in the palatant used. Each of the palatants was included at equal levels and applied only to the gravy portion of the recipes.

Near-infrared (NIR) spectroscopy was used to compare the chunks, gravy and complete CIG products before retort. Since the chunk formulation remained unchanged across all recipes, the chunk samples were compositionally very similar, as expected.

The gravies, however, each contained a different palatant and therefore exhibited clear compositional differences. Analysis of the complete CIG products showed an intermediate profile, reflecting the contribution of both matrices.

Grouped by performance

Following retort, flavor profiles of the gravy, chunks and complete product were analyzed using gas chromatography-mass spectrometry (GC-MS). Feeding trials were then used to classify the palatants according to palatability performance.

OPLS-DA* analysis showed that samples were grouped by palatability performance rather than by matrix. In other words, the characteristic flavor profiles associated with high-performing palatants were present in both the gravy and the chunks, despite the palatants being added only to the gravy. This provides strong evidence that volatile flavor compounds migrate between matrices during processing and/or storage.

Designing beyond the gravy

Although flavor migration between gravy and chunks occurs, the point of addition remains critical. Palatants can influence gel stability, chunk texture and product appearance, meaning their placement has functional as well as sensory implications. A deliberate evaluation of matrix interactions and processing conditions is therefore essential to preserve product structure while optimizing overall palatability. ♦

*An OPLS-DA (Orthogonal Partial Least Squares–Discriminant Analysis) score plot is a statistical visualization used to compare complex chemical profiles (volatile and semi-volatile compounds) between predefined groups (high and lower palatability).