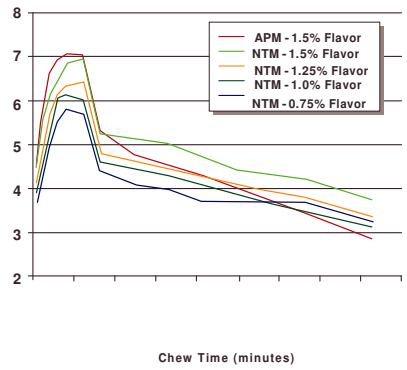
neotame™

Neotame and Flavor Enhancement

figure 1 **Neotame's influence on peppermint flavor in chewing gum.**



Introduction.

Neotame has been shown to enhance, modify and even mask off-flavors when used at sweetening levels. This finding may have commercial significance in chewing gum by prolonging both flavor and sweetness and in soy-based and nutritionally-fortified products where it may mask flavor notes unique to soy, vitamins and minerals. Perhaps even more interesting is neotame's ability to function in a similar capacity when used at non-sweetening, or sub-threshold levels.

According to the United States Food and Drug Administration (FDA 21CFR, 170.3), flavor enhancers are substances that "supplement, enhance, or modify the original taste and/or aroma of a food, without imparting a characteristic taste or aroma of its own." These attributes might be perceived as a heightened or prolonged flavor perception, an increased perception in mouthfeel or a change in acid sharpness.

Use of Neotame at Sub-Sweetening Levels.

To study neotame's usefulness at sub-sweetening usage levels, neotame was added to a sugar-sweetened, fruit-flavored powdered soft drink. A sensory panel compared the sweetness of a solution containing 9.56% sucrose and neotame at various concentrations to a solution containing 9.56% sucrose alone. The sweetening threshold level was defined as the highest concentration of neotame in sucrose solution that could not be perceived as sweeter than the sucrose-sweetened solution without neotame.

The panelists then compared the flavor of the fruit-flavored drink sweetened with 9.56% sucrose plus neotame at various concentrations below the sweetness threshold level with the same fruit-flavored drink sweetened with sucrose alone. Neotame demonstrated flavor enhancement at 1.0 ppm and above. It is important to note that sub-threshold levels for neotame will vary across applications.

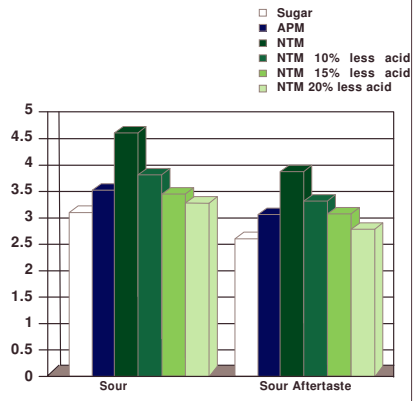
The addition of 2 ppm of neotame to soy yogurt improved overall liking scores without causing any change in perceived level of sweetness. The use of 2.5 ppm neotame in soy yogurt improved liking scores and increased sweetness and vanilla flavor intensity. Therefore, positive modification in the soy yogurt may be possible using either sub-threshold levels of neotame or amounts that contribute sweetness.

Use of Neotame at Sweetening Levels.

The flavor modification and enhancement properties of neotame at sweetening levels have also been observed in various applications. In a chewing gum study, the flavor intensity of a neotame-sweetened gum with a reduced mint flavoring content was comparable to an aspartame-sweetened gum with a standard level of mint flavoring. Similar flavor intensity to the aspartame (APM) sample was achieved after a 17% reduction in mint flavoring in the neotame (NTM)-sweetened gum (see *figure 1*).

Neotame and Flavor Enhancement (cont.)

figure 2 **Neotame's influence on citric acid in a strawberry flavored powdered soft drink.**



Source: Sensory Spectrum trained panel, n=5, 3 replicates 4/14-16/99 (SS#3357)

The ability of neotame to modify and enhance certain flavors may require some reformulation of both the flavor system and the acid level or type. For example, in a cola-flavored carbonated soft drink, key flavor components of cola flavor systems were demonstrated to be positively affected by neotame. Neotame was shown to enhance the flavor intensities and/or quality of lime oil and cinnamic aldehyde when tested in water solutions.

When vanilla extract was tested in a water solution with neotame added, and compared to an aspartame-sweetened control, the neotame-sweetened sample had more vanilla/vanillin notes, was more caramelized, and had a sweeter/vanilla aftertaste than the aspartame-sweetened samples. Vanilla, salt and fat are known in the flavor industry to sometimes mask, modify and enhance other flavors. If neotame is used with these ingredients, there may be an opportunity to reduce their usage level.

In a powdered soft drink, the use of neotame allowed for a reduction in the amount of citric acid of at least 20% without affecting sourness (see *figure 2*).

Summary.

Neotame can favorably modify and enhance the taste and flavor of foods either at sweetening or at sub-sweetening levels. Actual advantages and modifications will vary across applications. It is possible that some of these effects may result in a reduction of costly ingredients, such as flavors. They may also result in products receiving higher acceptance scores due to masking of off-notes or increased perception of flavor and sweetness over time.

More Information Is Available To You.

This bulletin is intended to be general in nature. We are eager to work with you in the development of new products and processes. For more information on neotame or to request a sample, visit our website at www.neotame.com or call our toll-free number at 1-800-323-5321.

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