



Neotame Stability.

Neotame has excellent stability as a dry ingredient. It can also be used successfully in a wide range of diet, reduced-sugar or mainstream food and beverage products. Both the stability and functionality of neotame can be demonstrated using a three-dimensional matrix model, which includes a wide range of processing and storage temperatures, pH, and moisture levels (see *figure 1*).

The food and beverage products that fit the model were considered representative of the processing and storage conditions that neotame would be subjected to in its application as a high-intensity sweetener and/or flavor enhancer. Stability and functionality were monitored using analytical and sensory data for each product application. Neotame was measured using validated high-pressure liquid chromatography (HPLC) methods during storage. All products were formulated, processed, packaged, and stored according to industry standards.

Results demonstrate that when used alone, or in combination with other high-intensity sweeteners or nutritive sweeteners, neotame provides acceptable sweetness throughout the expected shelf life of the products tested.

Similar to many other food ingredients such as flavors, neotame will break down over time. The kinetics of neotame degradation are pseudo-first-order, and the rate of degradation in solution is pH-, temperature-, and time-dependent.

Degradation is higher at lower pH values and during extended storage at higher temperatures. The major route leading to loss of neotame is hydrolysis of the methyl ester group. While the loss of neotame may result in a gradual lessening of perceived sweetness over time, the degradation products of neotame contribute no off-flavors or odors.

Neotame as a dry ingredient was evaluated for five years. When stored under conditions relevant to commercial use (25°C and 60% relative humidity), virtually no loss of neotame occurred. The study was carried out using both glass and sealed polyethylene storage bags.

Carbonated Soft Drinks and Ready-to-Drink Beverages. Neotame is functional as a sweetener in carbonated soft drinks, especially when formulated to pH values between 2.9 and 4.5.

When these products are properly handled and stored, the stability of neotame is adequate for normal shelf life. Beverages consumed within four to five months after manufacturing exhibit acceptable sweetness. Maximum product quality is maintained when finished product exposure to high temperatures and sunlight is minimized.

The loss of neotame is not concentration dependent, and the presence of other sweeteners does not adversely affect the stability of neotame. In most products, the presence of other sweeteners can increase the perception of sweetness over time which permits increases in the usable shelf life of products containing neotame.

Stability Overview (cont.)

Many non-carbonated still beverages and dairy drinks undergo some form of thermal processing (pasteurization). To understand the impact of extreme temperature conditions on neotame, sample beverages were prepared at pH values of 3.2 and 6.5.

They were exposed to high temperature short time (HTST) conditions of 88°C for thirty seconds and cooled gradually to temperatures as high as 32°C. Under none of these conditions was there any significant loss of neotame (<0.5%).

Powdered Soft Drinks. Delivery systems for neotame in powdered soft drinks (PSDs) and dry mixes are currently being developed. When packaged and stored appropriately (25°C, 60% relative humidity), neotame is not likely to be a limiting factor in the shelf life of most PSD products.

Bakery Products. In most baked good applications, neotame exhibits excellent stability. As a result, non-encapsulated neotame has shown good stability in bakery products. In a study of yellow layer cake, for example, 85% of the neotame remained at the end of baking and 81% was retained at the end of 5 days at room temperature.

Dairy Products. Neotame not only withstands pasteurization in dairy products, but it is not metabolized by the usual yogurt cultures during the culturing process. In experimental batches of yogurt, 99% of the neotame was present after ultra high temperature (UHT) pasteurization and no noticeable sensory degradation occurred after fermentation followed by 5 weeks of refrigerated storage.

Chewing Gum. In a stability study of encapsulated neotame in peppermint-flavored chewing gum, neotame was shown to be stable for at least 52 weeks (81% remaining). In other studies, non-encapsulated neotame was shown to provide an appropriate sweetness level throughout a 26-week study.

The flavor enhancing capability of neotame is of particular significance to chewing gum and some confection products. By providing longer lasting sweetness throughout the chewing process, neotame has been shown to enhance the perception of flavors 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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