



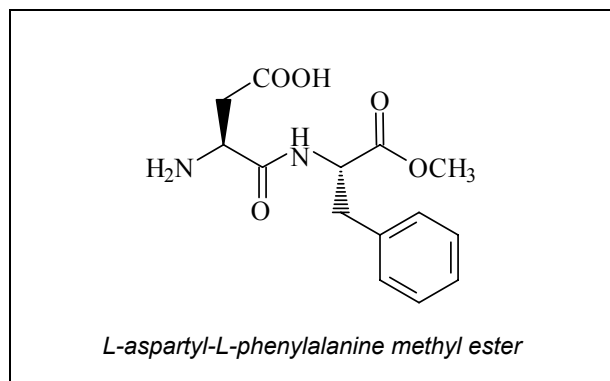
NutraSweet® in Pharmaceuticals

USE OF NUTRASWEET® IN PHARMACEUTICALS

NutraSweet® brand sweetener, generically known as aspartame, is a high-potency sweetener manufactured and marketed by The NutraSweet Company. Aspartame is the methyl ester of the dipeptide L-aspartyl-L-phenylalanine. (See Figure 1.) Its components are identical to those that occur naturally in many common foods.

NutraSweet® consistently meets or exceeds Food Chemical Codex (current edition) and USP/NF Standards for aspartame. Aspartame is regulated under 21 CFR 172.804 for use in food and under 21 CFR 201.21 and 330.1(e) for use in over-the-counter drugs. The foundation for the high quality of NutraSweet lies in the many years of experience that The NutraSweet Company has in aspartame production. With this experience come technical expertise and ample production capacity to ensure customers a steady supply of high-quality product at competitive prices. Ongoing efforts of the R&D staff focus on providing product formulation guidance to food and beverage manufacturers.

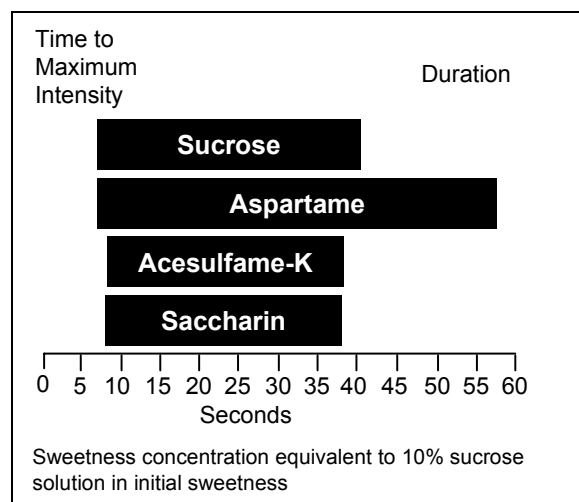
FIGURE 1. CHEMICAL STRUCTURE OF ASPARTAME



NutraSweet® provides clean, sweet taste that can be beneficial in a variety of dry pharmaceuticals. It has a longer sweetness duration than sucrose and other high potency sweeteners typically used in pharmaceuticals. (See Figure 2.) This characteristic extends its pleasant, sweet taste which is especially important in chewable tablets. In some systems, NutraSweet can mask the unpleasant taste of bitter ingredients. NutraSweet also appears to enhance

certain fruit flavors. Dry mixes with NutraSweet, such as bulk laxatives, have less production bulk than formulations made with sugar, leading to a potential reduction in packaging costs.

FIGURE 2. TIME TO REACH MAXIMUM SWEETNESS INTENSITY AND SWEET TASTE DURATION



The use of NutraSweet® brand sweetener in pharmaceuticals such as cough lozenges provides an oral health advantage. A number of scientific studies have shown that NutraSweet is non-cariogenic. Formulating products with NutraSweet gives manufacturers the opportunity to market sweet products that do not promote dental caries.

NutraSweet® provides a sweetener alternative for those with specific dietary needs. For individuals with diabetes, NutraSweet is the logical sweetener in pharmaceuticals. Numerous studies have demonstrated that aspartame does not affect blood glucose concentrations of individuals with diabetes. Furthermore, NutraSweet does not contain sodium and can be used in sodium-free formulations.

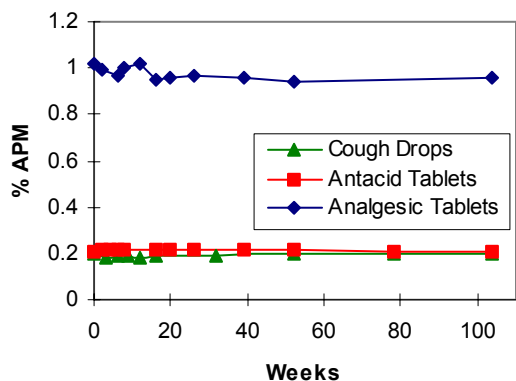
WORKING WITH NUTRASWEET® IN PHARMACEUTICALS

Dry stability of NutraSweet® brand sweetener is excellent. As with other dry ingredients, high humidity should be avoided during storage. NutraSweet has a long shelf life (approximately five years) when its container is kept tightly closed and is stored in a cool, dry area. NutraSweet is available in several forms:

powder, granular, liquid and blended with other commonly used ingredients. In most OTC pharmaceuticals, the powder form is commonly used.

The stability of aspartame is affected by moisture, pH, and temperature. These factors are interrelated and can be moderated by the presence of other ingredients and processing conditions. NutraSweet® is well-suited for use in chewable tablets, dry mixes, and cough lozenges. OTC pharmaceuticals sweetened with NutraSweet, such as fiber laxatives and chewable vitamins, have been commercialized and successfully marketed for several years. Stability data gathered on prototype cough lozenges and chewable tablets demonstrated no perceptible degradation (less than 5% loss) of NutraSweet over a 24-month period at a range of temperatures, including those commonly found in warehouses. (See Figure 3.)

FIGURE 3. STABILITY OF NUTRASWEET IN OTC PHARMACEUTICALS STORED AT 100-104° F



Normal processing procedures can be used in manufacturing chewable tablets, dry mixes, and cough lozenges with NutraSweet®. In some formulations, such as tablets and dry mixes, pre-blending NutraSweet with part of the bulking agent helps to distribute the NutraSweet more uniformly in the mix.

The amount of NutraSweet® detected in a final product is determined by use of High Pressure Liquid Chromatography (HPLC) after extraction from the system. HPLC methods for assaying NutraSweet and its conversion products are available upon request by contacting The NutraSweet Company.

NUTRITION/HEALTH ASPECTS

Aspartame can be considered to be a nutritive sweetener. It is digested to phenylalanine, aspartic acid, and a small amount of methyl

alcohol, which are then metabolized via normal physiological processes. When metabolized, it supplies four kilocalories per gram. Only small amounts of NutraSweet are needed to sweeten products, resulting in virtually no caloric contribution.

Since the discovery of aspartame in 1965, numerous scientific studies have been conducted to assess its use by the general public and special populations. The data generated by these studies have led experts around the world to conclude that NutraSweet® is an acceptable sweetener for use by the general population, including children as well as pregnant and breast-feeding women. Individuals with phenylketonuria who are on a phenylalanine-restricted diet need to be aware of the presence of aspartame in a product so they may make appropriate dietary choices. Therefore, in the United States, all products containing aspartame are labeled with the following phrase:

Phenylketonurics: Contains phenylalanine () mg per (dosage unit).

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 additional information about our products, please call **1-800-323-5321 (USA/Canada)**



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