Aspartame

WHAT IS ASPARTAME?

- An intensive, low/non-calorie sweetener
- A synthetic dipeptide formed by two amino acids – L-aspartic acid and L-phenylalanine

PROPERTIES OF ASPARTAME

- Contributes to a clean sweet taste
- Non-cariogenic
- Aspartame is 180x sweeter than sucrose
- Has a similar sweetness profile to sucrose with a longer onset time; in some applications, aspartame contributes to a lingering aftertaste
- As aspartame is not heat stable, it can degrade into its by-products including phenylalanine, an amino acid which some people cannot metabolise
  - *Aspartame can only be added to a limited range of products due to its sensitivity to heat*
  - *Can be added to foods at the end of the cooking cycle*
  - *Has limited shelf life*
- Good stability in dry conditions (<8% moisture) but is less stable in liquid systems
  - *The stability of aspartame is primarily a function of pH, temperature and time*
  - *Degradation of the sweetener is limited at low pH levels and when high-temperature short-time (HTST) systems are applied to minimise losses*
- Low solubility
  - *In soft drink applications, aspartame can be added, in its dry form, directly to the syrup tank after the addition of an acid to aid rapid dissolution*
  - *Alternatively, a more concentrated premix of aspartame suspended in water can be added to prevent clumping and adhesion of the powder to the mixing tank*

APPLICATIONS

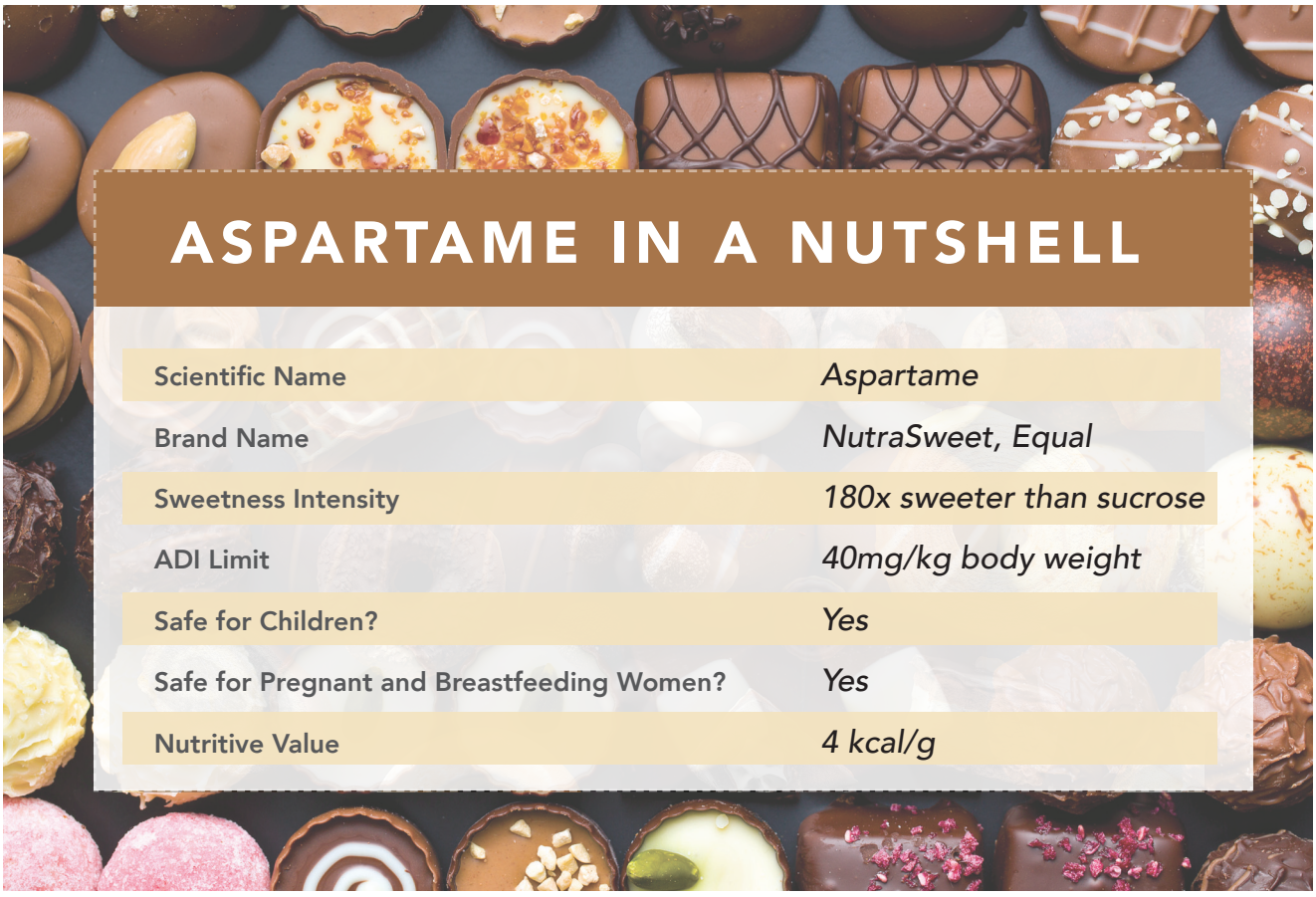
- Confectionery
- Soft drinks
- Table top sweeteners
- Dairy Products

REGULATORY STATUS OF ASPARTAME

- The use of aspartame is permitted in all major markets
- The established ADI for aspartame: **40mg/kg body weight per day**
  - ADI levels established are sufficiently high to be used as a sole sweetener in applications such as soft drinks
- Aspartame contains phenylalanine and is not recommended for consumption by individuals with a genetic condition that prevents them from being able to metabolise phenylalanine, leading to a build up of the amino acid in the blood and other tissues
- US Food and Drug Administration (US FDA) Approval
  - Approved for use as a table top sweetener in 1981
  - Approved for use in foods for generic purposes in 1996

DID YOU KNOW?

Aspartame is usually incorporated with the fruit preparation following fermentation in stirred yoghurts. While in set yoghurts, aspartame is added after pasteurisation but before fermentation, during which the addition of aspartame is increased by 15–30% to compensate for losses that occur during fermentation.



ASPARTAME IN A NUTSHELL

Scientific Name	*Aspartame*
Brand Name	*NutraSweet, Equal*
Sweetness Intensity	*180x sweeter than sucrose*
ADI Limit	*40mg/kg body weight*
Safe for Children?	*Yes*
Safe for Pregnant and Breastfeeding Women?	*Yes*
Nutritive Value	*4 kcal/g*

References

[1] Mérillon, J. and Ramawat, K. (2018). Sweeteners. Cham, Switzerland: Springer Nature.

[1] Hartel, R., von Elbe, J. and Hofberger, R. (2018). Confectionery Science and Technology. Cham: Springer International Publishing.

[1] O'Donnell, K. and Kearsley, M. (2008). Sweeteners and Sugar Alternatives in Food Technology. 2nd ed. New York, NY: John Wiley & Sons.