

Supporting document 1

Examples of how the MPL and unity principle affect the level of Ace K which can be added to chewing gum (at Approval) – Application A1100

Maximum Permitted Level of Acesulphame Potassium in Chewing Gum

Background

Section 1.3.1—6 of Standard 1.3.1 limits the amounts of additives in a food when two or more are used for the same technological purpose. This is often referred to as the “unity principle”. For intense sweeteners in chewing gum, the maximum amount of each additive is proportional to its MPL, as stated in subitem 5.2 of the table to section S15—5 of Schedule 15, with the sum of the proportions of all the additives not exceeding 1.

To produce a chewing gum product that meets both flavour and format preferences it is necessary to use blends of sweeteners, which in turn means it is necessary to apply the “unity principle” to chewing gum. As a result of the current maximum permitted level (MPL) in the Code for Ace K and the need to apply the “unity principle” some chewing gum products available in overseas markets are not permitted in Australia or New Zealand. Amending the current MPL for Ace K in chewing gum to a higher level of 5000 mg/kg addresses this issue (see examples below) and would allow currently prohibited chewing products into Australia and New Zealand.

Current permissions

As indicated in the Application typical sweetener blends in chewing gum contain Ace K and aspartame. The current permissions for these two intense sweeteners in chewing gum are:

INS number	Additive Name	Maximum Permitted Level (mg/kg)
950	Ace K	2,000
951	Aspartame	10,000

In the case of an intense sweetener blend of Ace K and aspartame added to chewing gum the relevant ratios and equation to satisfy the unity principle and the current permissions in Schedule 1 is:

$$x/2,000 \text{ (Ace K)} + y/10,000 \text{ (Aspartame)} \leq 1$$

where x and y are concentrations of the intense sweeteners in mg/kg.

Compliance with the Code - MPL of 2000 mg/kg

Some theoretically possible blends that are compliant or non-compliant with the current Code are shown below.

Ace K mg/kg	Aspartame mg/kg	Proportions	Outcome
2,000	6,000	$1.0 + 0.6 = 1.6$	>1 non-compliant
1,800	6,000	$0.9 + 0.6 = 1.5$	>1 non-compliant
1,800	900	$0.9 + 0.09 = 0.99$	< 1 compliant
1,500	2,500	$0.75 + 0.25 = 1$	= 1 compliant
1,000	5,000	$0.5 + 0.5 = 1$	= 1 compliant
800	6,000	$0.4 + 0.6 = 1$	= 1 compliant
500	7,500	$0.25 + 0.75 = 1$	= 1 compliant
200	9,000	$0.1 + 0.9 = 1$	= 1 compliant

Compliance with the Code - MPL of 5000 mg/kg

Some theoretically possible blends and compliance with the Code if the MPL for Ace K was increased to 5000 mg/kg

Ace K mg/kg	Aspartame mg/kg	Proportions	Outcome
2,000	6,000	$0.4 + 0.6 = 1$	= 1 compliant
1,800	6,000	$0.36 + 0.6 = 0.96$	< 1 compliant
1,800	900	$0.36 + 0.09 = 0.45$	< 1 compliant
1,500	2,500	$0.3 + 0.25 = 0.55$	< 1 compliant

A blend which the Applicant states to be desirable is 6,000 mg/kg aspartame and 1,800 mg/kg Ace K. As demonstrated above such a blend does not comply with the Code when the MPL is 2000 mg/kg due to the unity principle. By increasing the MPL of Ace K in chewing gum to 5000 mg/kg the blend is compliant with the unity principle.