Imported food risk statement

Pure and highly concentrated caffeine products

Scope: This advice applies to foods, food ingredients and beverages that contain caffeine

Recommendation and rationale
Does caffeine in high caffeine content food products present a potential medium or high risk to public health that may require additional management measures: ☑ *Yes* ☐ *No* **Rationale**: • Pure or highly purified forms of caffeine pose an unacceptable acute health risk to consumers. Ingestion of small amounts of these substances can result in severe health effects, including death. • The risk of serious health effects is compounded by the fact that these products typically need the consumer to self-measure caffeine servings, and require fine scales to weigh an appropriate dose. • To manage the risk to public health, Food Standards Australia New Zealand (FSANZ) has amended Standard 1.1.1 to provide that a food sold for retail sale must not contain total caffeine present in a concentration of 1% (liquid form) or more, or 5% (powder or other non-liquid form) or more.

General description
Nature of the toxin: Caffeine is a methylxanthine alkaloid synthesized by a number of plants and naturally found in foods such as coffee, tea, cocoa, chocolate, yerba mate and guarana. Caffeine is an antagonist of adenosine receptors in the central nervous system, reducing sleepiness and promoting mental alertness, and is widely used as a mild stimulant. Caffeine also helps reduce the perception of effort, making it popular among athletes as a performance enhancer. FSANZ is also aware that a number of analogues or derivatives of caffeine exist naturally or can be chemically synthesised. Caffeine analogues are not within the scope of this advice.
Adverse health effects: Acute ingestion of caffeine up to 200 mg is not associated with safety concerns in healthy adults. At higher doses, caffeine may cause adverse effects including increase in blood pressure and plasma catecholamines, and reduction of myocardial blood flow. Acute doses of 400-500 mg caffeine may cause increased anxiety in psychologically normal adults. Doses in excess of 1200 mg are associated with tachycardia, ventricular arrhythmia and seizures and may require urgent medical attention. Death has been reported at a dose of 3 000 mg, however it is more commonly associated with doses of around 5 000 to 10 000 mg caffeine. Susceptible subpopulations with lower tolerance for caffeine include children, pregnant or lactating women, people with hypertension, people with impaired myocardial perfusion, people with certain mood disorders such as anxiety, and people who are taking *p*-synephrine.

Consumption patterns:

Consumption of concentrations of caffeine naturally occurring in products including coffee, tea, cocoa, guarana, yerba mate, cola and chocolate occurs worldwide and is not generally associated with adverse effects.

Use in food of powders and other dry products containing 5% caffeine or more, or liquids containing 1% caffeine or more, is hazardous. The risk of serious health effects is compounded by the fact that these products can require equipment not usually available to consumers in order to measure accurately an appropriate dose (e.g. scales that weigh in milligrams).

Ingestion of a single serving of a heaped tablespoon of a caffeine powder containing 5% caffeine would be likely to deliver approximately 825 mg caffeine. Acute doses in this range would be unlikely to cause severe health effects in healthy adults, although they could be expected to be associated with unpleasant effects such as anxiety.

FSANZ considers that for concentrated caffeine solutions, a maximum permitted level of 1% w/v caffeine is required to protect public health and safety. This is based on the intended delivery of 100 mg of caffeine in a volume of 10 mL of a liquid product.

A quantity of 82.5 mL of a 1% solution would be required to ingest 825 mg of caffeine, the same amount of caffeine as contained in a heaped tablespoon of a bulk powdered product with a concentration of 5% caffeine.

Individually and divided packaged caffeine products are expected to have a different risk profile to bulk powders and liquid concentrates because the total caffeine exposure is likely to be limited by the form of the packaging. These could include strips, chewables and gels.

FSANZ notes that no safety concerns are associated with doses of up to 200 mg caffeine.

Risk factors and risk mitigation

FSANZ has prohibited the retail sale of powders or other dry food products containing 5% caffeine or higher, and the retail sale of liquids containing 1% caffeine or higher, to be used as foods or food ingredients.

The Department of Agriculture could target imports of pure and highly concentrated caffeine products to enforce the proposed restrictions in the Code, provided the substances are imported as food or food ingredients and fall within the scope of food that applies to the *Imported Food Control Act 1992*.

Standards or guidelines
FSANZ has approved a food regulatory measure after considering an urgent proposal to amend Standard 1.1.1 to prohibit the retail sale of pure and highly concentrated caffeine food products. This regulatory measure prohibits the retail sale of powders or other dry food products containing 5% caffeine or higher, and the retail sale of liquids containing 1% caffeine or higher, to be used as foods or food ingredients.

This risk statement was compiled in: December 2019, updated March 2020

References

FSANZ 2019. Pure and Concentrated Caffeine Products. https://www.foodstandards.gov.au/Documents/CaffeineReport2019.pdf