

Century Eggs

Description

Century eggs, also known as hundred-year old eggs, thousand-year old eggs, and pidan, are a traditional Chinese food made from eggs preserved through alkaline fermentation. Written records indicate that century eggs date back to as early as 1640. The fermentation process causes the albumen to gel and become a translucent brown colour, and the yolk to become dark-green with a creamy texture. Century eggs are typically eaten uncooked with condiments as an appetizer or side dish, or served with rice porridge. Eating century eggs is thought to have therapeutic effects such as increasing appetite and treating high blood pressure. Locally, century eggs are sold by the half-dozen at most Asian grocery stores.



Century egg wedges

How century eggs are produced

Century eggs are typically prepared from duck eggs, however they can also be made from chicken, quail, turkey, and goose eggs. There are many methods for preparing century eggs. In the traditional method, raw eggs are coated in a paste made of tea, lime, salt, and ash, and then rolled in rice hulls or tea leaves to prevent the eggs from sticking. The eggs are then stored away to ferment until they are ready to eat, which can be as long as several months. A more recent method is to soak raw eggs in a strong alkaline solution, which is more convenient and has a shorter fermentation time. In either method, lead oxide or zinc oxide may be added during processing to produce soft-yolked century eggs.

During the fermentation process, sodium hydroxide formed in the coating paste or solution penetrates the eggshell pores and causes physicochemical changes inside the egg. The sodium hydroxide causes degradation of egg proteins, resulting in the gelation and colour change of the albumen. Tea used during processing also enhances the brown colour of the albumen. Crystallization of the degraded protein products results in the formation of fine, snow-flake patterns in the albumen. The diffusion of sodium hydroxide into the yolk causes the proteins to coagulate into a semisolid or solid state, and the formation of ferrous sulfide causes the dark-green colour change of the yolk. The action of sodium hydroxide during fermentation also results in the release of hydrogen sulfide and ammonia. The release of ammonia increases the pH value of the final product.



Left photo: Peeled century eggs. Right photo (from left to right): Uncoated century egg, cross-section of a hard-yolked century egg, cross-section of a soft-yolked century egg, century egg shell coated with clay and tea leaves or rice husks

Appearance

Century eggs have a light grey shell with dark-green speckles that may be coated in clay and tea leaves or rice husks. Removing the eggshell reveals an egg with a gelatinous albumen that is translucent amber to brown in colour. Fine snowflake-like patterns may be visible on the albumen, which is considered to be an indication of a good-quality century egg. When cut in half, the yolk can be semisolid or solid, with concentric rings of different shades of green. The yolk gradually loses its dark-green colour when exposed to air at room temperature. Century eggs have a strong hydrogen sulfide and ammonia smell.

How century eggs are eaten

Century eggs are typically eaten without cooking or further preparation. After the shells are removed, they are often cut into wedges and served as an appetizer or side dish, with accompaniments such as soy sauce, salt, pickled ginger, vinegar, and/or tofu. Century eggs are also used as a condiment for dishes such as rice porridge.

Potential food safety risks

- Lead may be present in century eggs made with lead oxide. According to Health Canada, exposure to even small amounts of lead can be hazardous to health.
- The pH values for century eggs reported in the literature range from 8.98 to greater than 9.5. According to Biosecurity Australia, the internal pH of century eggs reduces the potential for *Salmonella* growth, but it is not sufficiently high to result in substantial inactivation of *Salmonella* that may be present.

Associated outbreaks

Based on a review of the literature, there have been no documented cases of foodborne illness attributed to the consumption of century eggs.

Food safety legislation

- According to the Canadian Food Inspection Agency, preserved duck eggs are not subject to the *Egg Regulations* of the *Canadian Agricultural Products Act*; a set of federal regulations respecting the grading, packing, marking and inspection of eggs and international and interprovincial trade in eggs.
- Century eggs are not specifically addressed in Regulation 562 (Food Premises) made under the *Health Protection and Promotion Act*.

Safe food handling of century eggs

According to the state of Georgia Department of Community Health Division of Public Health, century eggs have a pH > 9.0 and Aw > 0.92. Based on these factors, they require that operators who want to hold century eggs at room temperature have a product assessment performed to prove that they are safe to hold above 5°C (41°F).



Century eggs packaged for sale in cardboard (left), Styrofoam (centre), and plastic (right)