

Guidelines to the Trade on Reducing the Level of Ethyl Carbamate (EC) in Alcoholic Beverages during Storage and Transport

Purpose

The Guidelines provide recommendations to help the trade to minimize the level of ethyl carbamate in alcoholic beverages during storage and transport. The Guidelines are applicable to importers, distributors, wholesalers and retailers of alcoholic beverages, in particular wine and distilled spirit.

Background

Ethyl carbamate (EC) is a contaminant naturally formed in fermented foods during the fermentation process or during storage. Variable levels of EC have been found in different fermented foods such as bread, soy sauce and yogurt, and in alcoholic beverages such as spirits, grape wine and beer.

Public health concerns regarding EC in foods are related to its carcinogenic potential. In 2007, the International Agency for Research on Cancer (IARC) reassessed EC and up-graded its classification from Group 2B (“possibly carcinogenic to humans”) to Group 2A (“probably carcinogenic to humans”).

The Joint Food and Agriculture Organization/World Health Organization Expert Committee on Food Additives (JECFA) evaluated EC in 2005 and concluded that intake of EC from foods excluding alcoholic beverages would be of low concern. However, dietary exposure to EC from both food and alcoholic beverage was of concern and measures to reduce concentrations of EC in some alcoholic beverages were recommended.

At present, there is no international standard for the maximum allowable level of EC in foods. However, some countries such as Canada, Korea and some member states of the European Union (e.g. France, Germany and Czech Republic) have established maximum levels of EC

in alcoholic beverages. In Hong Kong, there is no subsidiary legislation governing the maximum level of EC in alcoholic beverages and foods.

The development of a "Code of Practice for the Prevention and Reduction of Ethyl Carbamate in Stone Fruit Distillates" has been approved as new work (Job code N11-2009) at the 32nd Session of Codex Alimentarius Commission held in July 2009. The Government will continue to keep in view the international development in this aspect. Members of the trade should make efforts to reduce the level of ethyl carbamate in alcoholic beverages and are invited to provide views and input in setting out the Guidelines.

Formation of EC in Alcoholic Beverages

EC in wine is formed primarily by the spontaneous reaction between ethanol and urea, a byproduct from the degradation of the amino acid, arginine, by yeast during fermentation. EC is also formed in distilled spirit, especially stone-fruit spirit (cherries, apricots or plums), via the reaction of ethanol and isocyanate, a byproduct from the enzymatic hydrolysis of cyanoglycosides present in the stones of the fruits. In addition to the amount of precursors present, light exposure and elevated temperature are the two key factors influencing the formation of EC in wine and distilled spirit during storage and transport.

It is known that EC will continue to be formed in wine during storage. The rate of formation is accelerated with increase in temperature. Significantly increased rate of formation of EC in grape wine has been observed at temperatures above 38⁰C. At the temperatures at which most wine cellars are maintained to keep the sensory properties and qualities of grape wine (i.e. below 20⁰C), less increment in EC content is expected.

Guidelines to the Trade

- Importers of wine/distilled spirit should obtain products from reliable suppliers, may consider importing products that meet the relevant EC standards of the exporting countries, if applicable.
- Take measures to prevent products from light exposure from production through shipment to storage and retail, for example, the

- use of proper containers and covering boxes.
- Special care should be taken to minimize heat exposure by maintaining the correct cold chain (preferably at or below 20⁰C, and critically not above 38⁰C) from production through shipment to storage and retail, for example, the use of appropriate insulated containers, shipping schedules and storage facilities.
 - Keep stock according to the first-in-first-out principle.

References:

1. IARC. Alcoholic beverage consumption and ethyl carbamate (urethane). International Agency for Research Volume 96. Geneva: World Health Organization; 2007. Available from URL:
<http://monographs.iarc.fr/ENG/Meetings/vol96-summary.pdf>
2. JECFA. Evaluation of certain food contaminants: sixty-fourth report of the Joint FAO/WHO Expert Committee on Food Additives. WHO technical report series no. 930. Geneva: World Health Organization; 2006. Available from URL:
http://whqlibdoc.who.int/trs/WHO_TRS_930_eng.pdf
3. JECFA. Safety evaluation of certain contaminants in food. FAO Food and Nutrition paper 82. Geneva: World Health Organization; 2006. Available from URL:
http://whqlibdoc.who.int/publications/2006/9241660554_ETH_eng.pdf
4. Codex Alimentarius Commission. Discussion paper on ethyl carbamate in alcoholic beverages. Agenda Item 9(e). CX/CF 09/3/13. February 2009. Available from URL:
http://www.codexalimentarius.net/download/report/722/cf03_01e.pdf
5. Codex Alimentarius Commission. Report of the 3rd Session of the Codex Committee on Contaminants in Foods. Rotterdam, the Netherlands. 23 – 27 March 2009. Available from URL:
http://www.codexalimentarius.net/download/report/722/al32_41e.pdf

