

Coffee with cancer warning

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Cancer is one of the well researched fields of health science and nowadays people are aware of cancer-causing agents. However, a judge from California, USA has recently ordered to put cancer warning on coffee packaging. Coffee is one of the most consumed drinks globally. An estimated 2.25 billion cups of coffee is consumed per day worldwide. This note is an effort to know how and why now coffee has come under the scanner.

Previous research reported that the problem is not with the coffee beans, but the process of roasting them. It has been observed that when coffee beans are processed at very high temperature (180–205°C), acrylamide, as an intermediate of Maillard reaction is formed.

Acrylamide is a white, odourless, crystalline solid which is easily soluble in water, thus making it a hazardous entity. Further, it has a very high boiling point (241°C) and a high melting point (84°C).

Chemical formula: C_3H_5NO
Chemical name: Prop-2-enamide

Acrylamide is listed as a potential carcinogen based on research on animals. A recent study was conducted on women in the age group of 45–74 years in Japan to analyse the association between dietary acrylamide intake and risk of breast cancer. However, no significant association was found between dietary acrylamide intake and risk of breast cancer in the selected population. Further, on the recommendation of the EU Commission, a study was performed on youth and college-going students, and it was found that women consume more coffee than men. Further, a study in Europe reported that instant coffee and commercial coffee substitutes had acrylamide content ranging from 200 to 4940 µg/kg. The study was done on 24 commercial coffee substitutes and 12 instant coffee samples. It

was observed that only two out of the 24 commercial coffee substitutes crossed the limit of acrylamide content set by the European Commission (4000 µg/kg) for this category of food. None of the instant coffee samples exceeded this limit.

The polyphenolic content of coffee is known to contribute to antioxidant activity. Antioxidants promote good health and prevent diseases. But roasting of coffee beans may alter the antioxidant activity contributed by polyphenols. Moreover, a study by the European Prospective Investigation into Cancer and Nutrition (EPIC) confirmed the previous evidences of reduced mortality by consuming coffee.

The United Nations agency (World Health Organization) had unlisted coffee from the possible carcinogens two years ago, but admitted that there was lack of evidence to exclude any possibility.

Acrylamide is not only found in coffee, but is formed in all food stuff containing high levels of carbohydrate when subjected to high-temperature procedures like roasting, frying and baking. In a study done in Spain, it was observed that on consuming coffee substitutes, instant coffee, French fries, potato chips, chicken nuggets, onion rings, breakfast cereals and biscuits, acrylamide content was increased after gastric digestion. Another study revealed that some of the baby foods, i.e. vegetable-based non-cereal food (65 µg/kg) and processed cereals-based infant food (42 µg/kg) contain recognizable amounts of acrylamide.

Green coffee extract is basically unroasted coffee beans and having more phenols than roasted coffee. It is a healthier option, although with less acceptable organoleptic properties and meant for weight loss. New research suggests that the ingestion of green coffee extract may improve arterial stiffness. Further, regular consumption of green/roasted coffee blend has been recommended for a healthy and hypercholesterolaemic effect, as it produces positive effects on blood pressure, glucose and triglyceride levels. Obesity and type-II diabetes are serious health problems and among the leading

causes of death. Further, chlorogenic acids are the most abundant phenolic compounds in green coffee beans and in the human diet, and have been suggested to mitigate several cardiometabolic risk factors. Green coffee extracts were found to improve several metabolic parameters, including fasting glucose, insulin resistance as well as liver triglycerides, which subsequently results in reduced weight gain, decreased adiposity and protection against liver damage.

Coffee is a favourite beverage in India and all over the world. Acrylamide is a probable carcinogen. However, there is a lacuna in knowledge regarding the effect of dietary acrylamide on human health. Most of the previous studies are based on questionnaires and acrylamide content of food databases. So some wet laboratory studies are needed to evaluate the direct effect of dietary acrylamide on human health. It is now the responsibility of the Government of India, FSSAI, Food Commission of India or any related authority to provide a clear picture regarding this issue on coffee. Also, more studies must be carried out on other edibles to avoid misinterpretations.

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