

9th International Congress on

Nutrition & Health

February 20-21, 2017 Berlin, Germany

Anti-cancer activities of Cheddar cheese: Cell cycle arrest and apoptosis induction

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Statement of the Problem: After cardiovascular diseases, cancer is the second leading cause of deaths, worldwide. The growing curiosity of diet and health relation has extended the necessity to exploit the nutritious, biologically active and sustainable food products. In this context, exploitation of bioactive peptide shares an exciting technological and scientific potential for their thriving applications. The pharmaceuticals, dietary supplements, functional and novel foods can be enriched with bioactive peptides for specific health benefits through nutrition. The present study was aimed to evaluate the potential role of water-soluble peptides (WSPs) extract derived from Cheddar cheeses with special reference to anti-cancer activities. Purposely, the WSPs fractions collected at different stages of cheese ripening were subjected to assess the cell viability, cell cycle arrest and apoptosis using lung (H1299) and colon (HCT-116) cancer cell lines. Cheese extracts of 120, 150 and 180 of ripening days showed marked anti-proliferation activity towards cancer cells in dose-dependent fashion. The extracts also caused significant changes in cell cycle distribution in comparison to the control cells. The substantial dose-dependent increase in the percentage of cells population in G₀/G₁ phase was observed in colon cells while WSPs extracts induced G₂/M phase cell cycle arrest in lung cancer cell line at rate of 400 µg/mL and 500 µg/mL. Moreover, these extracts also induced extensive early and late apoptosis in all cancer cells. The promising health potential of Cheddar cheese can offer a perspective to reduce the risk of disorders associated with cancer.

However, clinical and animal studies are further required to confirm the bioavailability and proper functional/ physiological role in body.

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