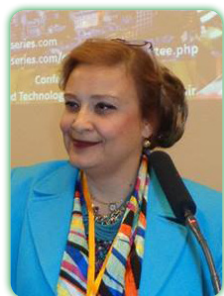


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Agri-food chain wastes and food by-products: Importance on nutrifood chemistry and anticarcinogenicity

Most food waste derivatives from the drink industry (26%), followed by the dairy and ice cream industry (21.3%), the production and preservation of fruits and vegetables (14.8%), the manufacture of grain and starch products (12.9%), the production, processing and preservation of meat products (8%), the manufacture of vegetable and animal oils and fats (3.9%), the production and preservation of fish and fish products (0.4%). Bioactive constituents potentially extractable from the targeted plant food by-products include majorly phytochemicals, fibers, natural flavor compounds, sugars, polysaccharides, ethanol, and proteins and its derivatives. The solid by-product, often called as “waste” or “pomace”, is obtained by pressing of fruits or vegetables and can contain pulp, peels, seeds and, stones. The processing of fruits and vegetables results in high levels of waste materials including peels, seeds, stones, and oilseed meals. In the innovative technologies, new aspects regarding the utilizing of above-mentioned wastes as by-products for further exploitation on the manufacturing of high-value products, food additives or supplements with high nutritional value. Especially stone fruits including apple, pear, citrus fruits, grape, tomato, tropical fruits including mango, aggregate fruits including pomegranate, berry fruits, olive and coffee, red beet, artichoke, asparagus, celery, endive, chicory, cucumber, broccoli are important fruit and vegetable sources that are given efficient by-products. By-products of fruit and vegetable as a sources of majorly phenolics and dietary fibre and minerals that have a wide range of action which includes antitumoral, antiviral, antibacterial, cardioprotective and antimutagenic activities. The animal-derived wastes include wastes from bred animals, wastes from seafood, and wastes from dairy processing as thirdly. The recovered biomolecules and by-products can be used to produce functional foods or as adjuvants in food processing or in medicinal and pharmaceutical preparations. Seafood product processing discard account for about three-quarters of the total weight of catch. Seafood processing has also been used as a possible waste utilization. It is known that the major components of seafood discard products are tongue, cheeks, stomach, liver of fish, protein bioactives from residual fish, marine bioactive lipid components (omega 3,6, DHA,EPA), fish skin, carotenoid bioactives and chitinous materials from shellfish products, gut enzymes, flavor products, anti-freeze proteins from seafood blood. Fish skin waste could be used as a potential source to isolate collagen and gelatin. Fish collagen and gelatin are currently utilized in diverse fields containing food, cosmetic, and biomedical industries. Collagen and gelatin are unique proteins compared to fish muscle proteins and they are generally rich (above 80%) in non-polar amino acids including glycine (Gly), alanine (Ala), valine (Val), proline (Pro) aminoacids whereas gelatine geerally contains glycine unites, proline and 4-hydroxyproline residues. Collagen and gelatin could be also isolated from bone and fins of fish processing by-products. Astaxanthin (3,3-dihydroxy- β,β -carotene-4,4-dione) from seafood by-products is a ketocarotenoid oxidized from β -carotene, that plays biological roles and possesses a number of desired properties for food and medical applications owing to it is natural ketocarotenoid, nontoxic, high versatilitie, hydro and liposolubility property, its attractive pink color, its biological functions as vitamin A precursor and superior antioxidant characteristics. Appropriate utilization of meat by-products is important for the profitability of the meat sector. Meat by-products are produced by slaughter houses, meat processors, wholesalers and meat rendering plants. It is reported that by-products including organs, fat or lard, skin, feet, abdominal and intestinal contents, bone and blood of cattle, lambs and pigs represents 66.0, 68.0 and 52.0% of the live weight, respectively. It is determined that many organ meats contain more polyunsaturated fatty acids (PUFAs) than lean tissue while brain, chitterlings, heart, kidney, liver and lungs contain lowest level of monounsaturated fatty acids (MUFA) and the highest level of polyunsaturated fatty acids (PUFA). Bioactive peptides generally

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contain between 3-20 amino acid residues and various generated peptides are denominated bioactives peptides due to their determined health benefits to the consumers like antihypertensive activity. It is stated that main by-products of dairy industry are whey, buttermilk, ghee residue and sometimes skim milk. The techno-economic issues connected with the utilization of dairy by-products and remarkable progressions have been made in processing equipments. It is reported that whey protein hydrolysates enriched in free amino acids (AAs) and hydrophilic peptides could have been responsible for the rised insulintropic response of BRIN-BD11 cells. In this context, the potential utilization of whey protein hydrolysates and peptides can be performed as natural complementary approaches; these could be implemented through dietary intervention and food-drug therapies for type 2 diabete management by inhibiting DPP IV activity and thence increasing the half-life of incretin hormones.

Biography

Ozlem Tokusoglu has completed her PhD at Ege University, Department of Food Engineering in 2001. She is currently working as an Associate Professor at Celal Bayar University, Department of Food Engineering. She was Visiting Scholar in Food Science and Nutrition Department at University of Florida, USA during 1999-2000 and as Visiting Professor at the School of Food Science, Washington State University, Washington, USA during April-May 2010. She has published many papers in peer reviewed journals and serving as an Editorial Board Member of selected journals. She has published two international book entitled Fruit and Cereal Bioactives: Chemistry, Sources and Applications; Improved Food Quality with Novel Food Processing and; Food By-Product Based Functional Food Powders. She also published two national books entitled Cacao and Chocolate Science and Technology and Special Fruit Olive: Chemistry, Quality and Technology. She has organized and/or administered as Conference Chair at many conferences and congress in various parts of USA, Europe and Asia-Pacific.

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