Chapter 30
Value–Added Products From Food Waste

Baban Baburao Gunjal
Sunrise Biotech Organisation, India

ABSTRACT

Food waste is the most challenging issue humankind is facing worldwide. Food waste, which consists of carbohydrates, proteins, lipids, and inorganic compounds, is a biodegradable waste discharged from food processing industries, households, and hospitality sectors. The management of food waste is very important. The food waste generated is usually incinerated or dumped in open areas which may cause severe health and environmental issues. The management of food waste can be done by conversion to different value-added products, for example, phytochemicals, bioactive compounds, food supplements, livestock feed, dietary fibers, biopigments and colorants, emulsifiers, edible and essential oils, biopreservatives, biofertilizers, biofuels, and single cell proteins. The value-added products from food waste will be very eco-friendly. The chapter will focus on different value-added products from food waste.

INTRODUCTION

The problem of food waste is increasing, involving all sectors of waste management from collection to disposal. Global food waste is approximately 1.3 billion tons per year (Kojima & Ishikawa, 2013). It is estimated that more food is wasted in the industrialized countries compared to the developing nations on per-capita basis (Gustavsson et al., 2011). The wastes generated from food processing industries are shown in Table 1.

Recently, there is great emphasis on the recovery, recycling and reconditioning of food waste. The efforts are made to convert food waste into value-added products (Laufenberg et al., 2003). The food waste can be converted into useful value-added products viz., phytochemicals, bioactive compounds, food supplements, livestock feed, dietary fibres, biopigments and colourants, emulsifiers, edible and essential oils, biopreservatives, biofertilizers, biofuels and single cell protein. India's share in some agricultural and horticultural produce is shown in Table 2.

The potential of vegetable wastes for production of value added products and for the generation of biofuels is an efficient mode of food waste management. Strategies for efficient waste management must be adopted. The best approach for the waste management is reduction of the waste at its source. Socio-economic aspect of waste generation and handling also has to be considered for adopting an efficient strategy of integrated waste management. Food waste is generated as a part of human society at small domestic level and at large industrial level. In developed countries, the waste management practices followed are viz., sanitary landfills, composting, incineration etc. Wastes are collected and mostly dumped in open or burnt in open (Sandra, 2006). This has serious impact on both environment and human health. When dumped in open or in landfills, food wastes get decomposed by the action of various microorganisms. This produces different gases like methane and carbon dioxide both of which contribute to the greenhouse effect leading to global warming (Brown & David, 1994).

The problem of food waste must be solved by converting the waste into various value-added products which will be very eco-friendly and also effective. The various value-added products from carrot, onion, pea, tomato and sugar beet are mushroom, biomethane, biohydrogen, single cell protein, biogas, bioethanol, mushroom, vinegar, α-L-arabinofuranosidase, organic acids, oligomers, fertilizers, glycoalkaloids, animal feeds, etc.

Table 1. Wastes generated from food processing industries

Food processing industry	Waste materials
Animal products	Skins, hides, blood, fats, horns, hairs, bones, liver, intestines
Poultry processing	Skin, blood, fats, hairs, feathers, bones, liver, intestines, wings, trimmed organs
Marine products processing	Shells, roes, trimmed parts, pincers
Cereals and pulse processing	Husk, hull, chaff, stalks
Fruits and vegetable processing	Skin, peels, stones, fibre, pith
Nuts	Shells, coir, pith
Spices and condiments	Hulls, stalks.

(Rao, 2010)

Table 2. India's share in some agricultural and horticultural produce

Fruit / Vegetable	Global production (%)
Mangoes	54
Cauliflower	30
Bananas	23
Green peas	36
Onions	10

Related Content

An Exploratory Study on Blockchain Application in a Food Processing Supply Chain to Reduce Waste

Emily Anne Careyand Nachiappan Subramanian (2021). *Research Anthology on Food Waste Reduction and Alternative Diets for Food and Nutrition Security (pp. 376-394).*

www.irma-international.org/chapter/an-exploratory-study-on-blockchain-application-in-a-food-processing-supply-chain-to-reduce-waste/268148

Nutritional and Pharmacological Properties of Bay Leaves (Laurus nobilis L.)

Rashmi Srivastava (2020). *Ethnopharmacological Investigation of Indian Spices (pp. 114-123).*

www.irma-international.org/chapter/nutritional-and-pharmacological-properties-of-bay-leaves-laurus-nobilis-l/252452

Effects of Gluten on Health: Pseudocereals as Gluten Substitutes

Ipek Bayrakciand Tugba Aktar (2024). *Innovations in Engineering and Food Science (pp. 318-343).*

www.irma-international.org/chapter/effects-of-gluten-on-health/337281

Effects of Industrial Processing Methods on Camel Milk Composition, Nutritional Value, and Health Properties

Ali Ahmed Metwalliand Yonas Hailu (2020). *Handbook of Research on Health and Environmental Benefits of Camel Products (pp. 197-239).*

www.irma-international.org/chapter/effects-of-industrial-processing-methods-on-camel-milk-composition-nutritional-value-and-health-properties/244741

New Meat Without Livestock

Kurt Schmidinger, Diana Boguevaand Dora Marinova (2021). *Research Anthology on Food Waste Reduction and Alternative Diets for Food and Nutrition Security (pp. 1110-1127).*

www.irma-international.org/chapter/new-meat-without-livestock/268189