

Upcycled Food: A Strategy for Food Waste Management and a Challenge for Food Choice Motives

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ABSTRACT

Upcycled foods are made from ingredients that would not otherwise be used for human consumption, such as damaged crops, by-products and scraps from food preparation. Upcycled food is a new food category and faces several challenges. The aim of this thesis was to investigate four challenges that the upcycled food category encounters. These challenges included incorporating upcycled food production in the food waste management hierarchy; identifying the upcycled food choice motives; assessing the importance of the environmental, nutritional and food safety characteristics of these foods; and identifying the practical issues in the production of upcycled foods. The literature review resulted in introducing an updated version of the food waste management hierarchy by including upcycled food production as a separate food waste management action that is less preferable than redistribution but more favourable than reuse for animal feed. Factors influencing upcycled food choices and nutritional, environmental and food safety preferences were investigated by administering a food choice questionnaire in Sweden. The identified upcycled food choice factors were ethical concerns, natural content, sensory appeal, price, healthiness, familiarity and impression. In terms of nutritional and environmental preferences, the energy and nutrient (i.e. protein, fibre and fat) content of upcycled foods were not as important as their environmental characteristics. Food safety features were also important, particularly the absence of contamination and poisoning. Regarding the practical challenges of developing upcycled food, the production of upcycled flour and its application in baking bread were examined in a pilot study. In this study, oyster mushroom cultivation residue (a mixture of brewer's spent grain, wheat bran and mycelia) was used to prepare bread. The sensory characteristics of this bread, such as darkness, sponginess, a sour taste, a bitter aftertaste and an aromatic smell, differed from those of white bread. However, the overall liking score and acceptability were not significantly different from those of white bread. In summary, upcycled food production can be included in the food waste management hierarchy to draw attention to policy development. Furthermore, as several health- and non-health-related food choice factors and environmental and food safety elements are deemed important for the general public, these factors should be considered in upcycled food development and marketing. However, attention to the nutritional aspect of upcycled foods requires advocacy, and achieving sensory appeal demands product reformulation. Addressing these four challenges can, directly and indirectly, improve the introduction of upcycled food to society and facilitate its acceptability.

Keywords: upcycled food, waste-to-value food, upcycled food choice motives, upcycled food nutritional characteristics, upcycled food environmental characteristics, upcycled bread