

# **Studies on the reduction of food waste in the Food industry especially in the food supermarket**

**Mizuho Sato**

## **Abstract**

### 1. Introduction

The amount of food waste, world-wide, is large. A report by the Food and Agriculture Organization of the United Nation (FAO) showed one third of the food become waste (about 1,300 million tons) and, when calculating the waste as an amount of money, it is about 750 billion US dollars per year. If somehow such food waste could be used for people who need food, 2 billion peoples could be saved. Also in Japan, food waste is large, so it is important to reduce food waste in Japan as well as in the world at large. Japan's food waste is 19 million tons per year and 5 to 9 million tons of that food waste comes from food loss. Therefore, food waste in Japan's overall food industry was chosen as a focal point, concentrating on waste in Japanese food supermarkets, and sources, causes, and conditions of waste generation were analyzed. A system for reducing, reusing and recycling supermarket food waste was defined and tested.

### 2. Contents of Paper

This paper consists of eight chapters. In chapter one background research on the importance of this subject is described. In chapter two an analysis, using Quality Function Deployment (QFD), is made of the structure of waste generating in the food industry, including actions of consumers and employees which influence generation of food waste.. In the third chapter, food waste generation in food special supermarkets is analyzed. Employee education to reduce food waste was suggested based on data on the large amount of vegetable and fruit waste, along with other concrete methods for reducing such waste. In Chapter 4, descriptive food labels for food waste reduction are

proposed. Widespread lack of consumer understanding of food labels was found in this research. Moreover, consumers who know the background (inspection methods, a safety factors, the 1/3 rule) of the current descriptive label setup clarified few things for this research. It turned out that there are many consumers who decide how long to retain foods, using them. A new food label scientifically based is devised, along with a label method containing the date manufactured plus a safety factor, and a 1/3 rule. In Chapter 5, the present condition of Japanese food banks is clarified along with a proposed way to encourage more food bank activity. The proposal unites food stock and food bank activation. Stockpiled food is evaluated nutritionally showing the ratio of lipid and carbohydrate is high, and vitamins and minerals insufficient. Vegetables and fruit are proposed as a source of good nutrition, along with particular coordination with supermarkets. Examination of laws on recycling food waste is done in Chapter 6. A recycling method accepted by consumers in supermarkets is clarified ending in a proposed waste zero (zero emission) approach.

### 3. General discussion, conclusion and perspectives

Chapter 7 contains a general discussion. Chapter 8, presents conclusions and perspectives. Deepening use of the 3R idea of Reduce, Reuse, and Recycle to develop technology is suggested. Cooperation of all involved parties, from consumers, food suppliers, supermarket, legal regulators, to government and how it must evolve to reach national zero waste emission is discussed. What Japan might be able to pioneer for use elsewhere in the world is stated with specific recommendations.