
Consumer Education and Food Waste: An Example of the Bakery Market - the Case of Young Consumer

Submitted 22/08/20, 1st revision 19/09/20, 2nd revision 27/10/20, accepted 11/11/20

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Abstract:

Purpose: In recent years, more and more attention has been paid to food waste. As part of Corporate Social Responsibility strategy, players in the food supply chain began to work to avoid and reduce food waste. Educational campaigns for consumer, which are implemented by government institutions and non-governmental organizations concerning the bakery sector are an initiative that meets the requirements linked to the idea of "Don't waste food". The aim of the article is to demonstrate the importance of consumer education in terms of minimizing waste in the food chain illustrated by the case of the bakery market in Poland, and thus eliminating the phenomenon of food waste.

Design/Methodology/Approach: The methodology used includes analysis of primary and secondary sources as well as reports. A survey was carried out in focus groups among youth between 19 and 25 years old. 384 respondents participated in the survey. The survey was carried out between October and December 2018.

Findings: Most products are wasted at the final stage of the food chain. Bread and bakery wares account for more than 50 % of total food waste. The most numerous group that admits to wasting bakery wares are young people. Among the most important reasons for wasting, respondents mentioned "Non-compliance with the use-by date" and "excessive amount of purchased bread". The respondents indicated a beneficial effect of educational campaigns on their behaviour in preventing bread waste.

Practical Implications: Recognition of the importance of education among young people and its impact on the behaviour of wasting products in the bakery industry.

Originality/Value: Identifying the reasons for wasting of bakery wares among young consumers and indicating the reasons for reducing the waste phenomenon.

Keywords: Food waste, consumer information, educational campaigns, young consumer, social marketing.

JEL code: D12, D91, Q13, Q56.

Paper type: Study research.

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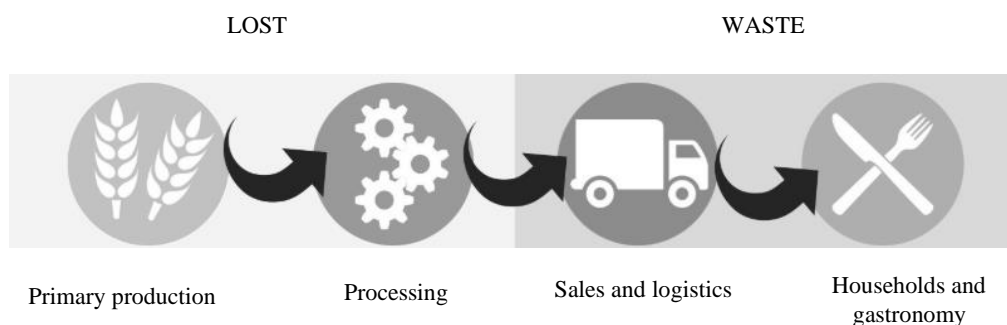
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1. Introduction

Food waste caused by people's consumption and purchasing habits is increasingly perceived as a challenge facing both, the developed and developing countries (Ellison and Lusk, 2018). In developed countries, the greatest losses and food waste concern the phase of consumption, while in developing countries - handling of the raw material after harvest. In developed countries, raw materials are rejected because they do not meet trade standards, even though they are fit for consumption. On the other hand, in developing countries, these losses relate to a lack of adequate infrastructure, e.g. warehouses, cold stores, etc. The waste phenomenon was defined by the FAO. Losses consist, by definition, in a reduction in the edible mass of food resulting from mismanagement, errors and irregularities in the course of processes, e.g. in agricultural production, harvesting, processing, transport or trade.

The term "food waste" refers to irrational management processes in the area of food services and households (Wrzosek *et al.*, 2012). UN Food and Agriculture Organization (FAO) figures show that we waste 1.3 billion tons of food annually. This is a loss of about 1/3 of the food produced, in times when as many as 850 million people in the world are going hungry. In Poland, 9 million tons of food is wasted annually. 88 million tonnes of food waste are generated in the European Union, worth EUR 143 billion (HLPE, 2014). These losses are incurred across the whole food chain "from farm to fork" (Bilska *et al.*, 2015). Food loss and waste have a huge impact on societies, economies, climate and other aspects of the natural environment. The problem of food losses and waste occurs in the whole food supply chains, which can be illustrated as follows (Figure 1):

Figure 1. Food Lost and Waste. Losses in the food chain according to FAO



Source: Studies based on *ncez.pl*

The food chain is an ordered and interdependent collection of management processes, the main goal of which is the flow of quantitatively and qualitatively adequate and sufficient food mass that enables feeding the population. The essence of the chain is to ensure stability of supply as well as to guarantee the health safety

of the offered products. The knowledge, awareness and other attitudes of people involved in the food supply chain determine the level of food loss and waste (Gustavsson *et al.*, 2016).

The aim of the article is to show the importance of consumer education in terms of minimizing losses in the food chain on the example of the bakery market in Poland, and thus to eliminate the phenomenon of food waste.

2. The Consumer in View of the Losses in the Food Chain

2.1 Materials and Methods

The study analysed and discussed the attitudes and practices of young consumers in view of wasting bakery wares on the basis of the evaluation of pilot qualitative studies and data published in the literature. Qualitative studies were carried out using the focus groups method; the group size did not exceed 12 people. The target group were students of the Faculty of Agrobioengineering at the University of Life Sciences in Lublin. Eventually, 384 respondents aged 19-25 participated in the study. Ordinal and 5-point scales were used to assess the respondents' answers. The reliability of the scales used was assessed by calculating the Cronbach's coefficient alpha for them and, assuming the acceptable level of the coefficient $\alpha > 0.7$, then the scales used in the study were considered reliable (Henson, 2001). The questions that respondents were asked concerned the following areas:

- reasons for the phenomenon of wasting bakery products,
- issues related to the reduction of waste,
- identifying activities that promote the philosophy of not wasting bakery wares.

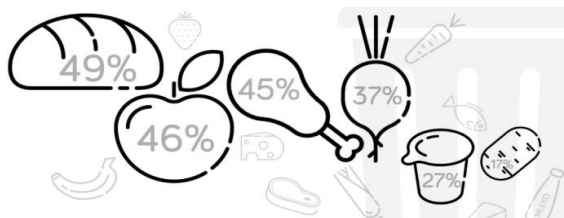
2.2 Food Waste

A sustainable food chain is also a cycle of economically rational processes aimed at preserving the potential of the natural environment. Economic goals include the balance between supply and demand, stabilization and an appropriate level of food prices, as well as maintaining jobs (Sznajder, 2008). Identification of causes of food losses and waste is an essential element in the search for ways to limit them. The responsibility for food waste rests with all entities - the food chain members, so it is justified to undertake joint initiatives to reduce it (FAO, 2013).

According to Radzyńska *et al.* (2016), the problem of food waste concerns mainly consumers who cause about 42% of losses (42 people out of 100 throw away food). The most common food thrown away is bread, fruit, cod meats and vegetables (Figure 2). Food waste and waste management issues in households may vary depending on the region of residence or the socioeconomic status of the consumer. In the literature, irrational purchasing decisions and irresponsible food management

during cooking are mentioned as possible causes of this phenomenon (EUFIC, 2012).

Figure 2. Share of most discarded products



Source: Based on the report “I don't waste food 2018” (ncez.pl). The respondents could select up to 5 categories, the sum is not equal to 100%.

Among the causes of the phenomenon of waste, the surveyed consumers most often mentioned: not paying attention to the expiry date on the packaging, over-shopping and the fact that bread generally has a short expiry date.

Table 1. The causes of bread waste in households $n = 384$

Variable Name	Ranking	Average	SD	Sum of indications in%
Non-compliance with the use-by date	1	4.43	±0.99	62.6
Excessive amount of bread purchased - over-shopping	2	4.05	±0.92	47.8
Short expiry date	3	3.98	±1.05	35.2
Inadequate storage conditions	4	3.78	±0.97	24.6
Losses at the table - distasteful - inadequate quality	5	3.63	±0.94	22.1
Mismanagement	6	3.54	±1.02	19.4

Note: The respondents could select at least 3 reasons, the sum is not equal to 100%.

Source: Compiled on the basis of own study.

Using the Pearson χ^2 test of independence and the Cramer V-coefficient to test the strength of the relationship between the variables, it was found that descriptive variables - such as gender, place of residence, financial situation - have a moderate impact on the phenomenon of wasting bakery products among the respondents ($V < 0.2$; $p \leq 0.1$).

2.3 Consumer Education

It is important to educate consumers and promote proper storage, planning of food purchases and consumption. Most FLWs in high-income countries occur in households, so to prevent food waste, communication in supply chains and consumer awareness must be improved. Consumers need to receive education about expiry dates, purchase and consumption planning. In the era of consumerism, when

people strive to ensure high level of consumption and food is relatively cheap, in highly developed societies, preventing and combating food waste is a real problem. NGOs are at the forefront of units dealing with consumer education and running campaigns / social events related to preventing losses in the food chain. The conducted activity is called social marketing.

In the presented study, an attempt was made to define the relationship (significance and strength of the relationship) between the perception of bakery wares and the awareness of limiting their disposal.

Table 2. Relationship between perception and reduction of discarded products

Perception of products	Intentions	
	Bread	Other bakery wares
Impact of the "from the grain to the loaf" educational programme	0.53**	0.59**
Products are of high-quality	0.54**	0.56**
Products are for all ages groups	0.31*	0.25

Note: * statistically significant relationships ($p < 0.05$); ** statistically significant relationships ($p < 0.001$).

Source: Compiled on the basis of own study.

It should be emphasized that the "from the grain to the loaf" programme (one of the compulsory educational programmes in primary schools) influences the later behaviour of consumers - a respectively high levels of $r = 0.53$ and $r = 0.59$ at $p < 0.001$. We observe a large correlation between the consumer's awareness that the bakery wares they buy are of high quality and the effort to consume them so as not to throw them away. A weak correlation was observed between the awareness of reducing waste and the fact that bread is a product for all age groups and there is no dependence of targeting the remaining bakery wares to specific age groups.

3. Social Campaigns on the Bakery Wares Market

Social campaigns intend to change the behavioural patterns from the point of view of society and to abandon undesirable behaviours, change reality, raise awareness of a given problem, expand knowledge, explain phenomena, engage in social matters (Petrovici and Dobrescu, 2013).

Especially among young people, we notice the influence of media and social networks, and thus of people known on the web. If bloggers, influencers and youtubers get involved in the campaigns, the content more easily reaches the followers and they served as a role model for young people. Among the principals of the campaign, we can mention the Ministry of Agriculture and Rural Development, the Ministry of Health, the Food and Nutrition Institute and various non-governmental organizations. Communications of information are created on their orders to draw the attention of the recipient of activities to their habits, beliefs

or reasons that they profess and to create a desire to redefine them. The role of such actions is mainly an impulse to make a change. In 2012, the Foundation for the Support and Promotion of Bakery and Confectionery was founded. Its tasks included educating the public on nutrition, especially in the field of bread (campaigns of type "I buy, don't waste"). Funded social campaigns regarding responsible lifestyle shape pro-health and pro-ecological behaviour and influence the knowledge of the public. One can remember a properly conducted campaign for a long time (Okręglińska *et al.*, 2018).

The National Rural Network actively participates in promoting the idea of sustainable development by providing financial support to projects aimed at educating the society in the effective use of agricultural products, especially by promoting the festival of bread (harvest festival "Dożynki") in cities and towns.

4. Conclusions

Food preferences, dietary choices and habits are extremely difficult to change as they are at the heart of people's lifestyle and their socio-cultural environment. Many people already have a positive attitude towards sustainable food, but the noticeable gap between being positive and real purchasing and sustainable consumption behaviours remain to be covered (Vermeir *et al.*, 2020). Food waste is a complex problem that requires a broad approach to analysing several factors simultaneously.

The model of factors influencing consumer behaviour towards food waste was proposed in their research by Aschemann-Witzel *et al.* (2015). The model takes into account two groups of factors: socio-demographic and psychological, which are of great importance in explaining consumer behaviour towards food waste. An important role in the model is played by psychological factors, including motivation that depends on financial benefit, ethical considerations, religious beliefs and concern for the environment. Economic factors can influence efforts to reduce food that is thrown away. Research conducted by Biliska *et al.* (2020) confirms the legitimacy of the results obtained by the author - bread is the most wasted product among young consumers, therefore this segment of consumers should be targeted with educational campaigns. Various governmental and non-governmental organizations can help in this regard.

Research confirms that the most numerous group of food wasters are young people. Preka *et al.* (2020) in Albania obtained results similar to the results of authors confirming that on the bakery wares market it is the young consumer who is responsible for the greatest losses.

Consumer research of the Food and Nutrition Institute (2016) showed a high level of declarative understanding of Poles of the healthy lifestyle and nutrition, and at the same time a low level of its use in practice. The research revealed the schematic nature of the action - failure to think about purchases, buying for stock, which was

also confirmed by the authors, specifically in relation to a young consumer aged 19-25. Lack of adequate knowledge about a proper storage of bread and ways to reuse leftovers. In the studies conducted by Radzymińska *et al.* (2016), consumers indicated that products from the bakery market are the easiest to recycle.

However, the key element is the identification of factors influencing the level of food waste in households. A good understanding of the determinants of food waste in households will allow the development and implementation of effective educational programmes aimed at consumers, which will help reduce this negative phenomenon. Therefore, food waste is an important topic for scientists, practitioners and policy makers interested in consumers' food preferences.

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