

Food Waste Behavior of Rural Women

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Abstract

The main objectives of the study were to assess the food waste behavior of rural women in the household and to explore relationships of selected characteristics of rural women with their food waste behavior. The study was conducted with randomly selected four women Common Interest Group of Bhabakhali union under sadar upazila of Mymensingh district. Personal interview was conducted to gather data on women's behavior towards household food waste. Possible solutions to the problems were identified through focus group discussion. Appropriate scales and techniques were developed and used in order to measure various issues of the study. Pearson's Product Moment Correlation Coefficient (r) was computed to explore relationships between the characteristics of the respondents and their behavior towards household food waste. Most of the respondents (82%) had good status of food waste behavior in the rural household. Among the selected characteristics of the rural women, household farm size and training exposure showed positive and annual family income showed negative significant relationships with their behavior towards food waste. And the rest of the characteristics did not show any significant relationships with their behavior towards household food waste. Majority (84%) of them faced medium problems in reducing their household food waste. Insufficient money for purchasing different food preserving materials, lack of food storage facilities, etc. were the main problems faced by the rural women in reducing their household food waste. Towards solving these problems they suggested that if government and non-government organizations take initiatives to involve rural women in different income generating activities, they would be able to increase their household income. It will help them to purchase nutritious food materials, food preserving material etc. and they were deemed desirable to triumph over the constraints.

Keywords: Food waste, rural women, behavior

Introduction

The availability of sufficient healthy food is essential for the survival of the human species. Despite its importance, a large amount of edible food wasted along the food supply chain owing to overstated expectations, ineffective technical and management system, and other causes. In some cases, these effects cannot be quantified in detail owing to a lack of relevant data on the interaction of food wastage and socio-economic consequences (FAO, 2011).

According to FAO, food waste refers to food that is good in quality and fit for human consumption but that does not get consumed because it is discarded either before or after it spoils. Food waste is any removal of food from the food supply chain which is or was at some point fit for human consumption, or which has spoiled or expired, mainly caused by economic behavior, poor stock management or neglect (UN, 2016). It has been estimated that in developing countries 44 percent of losses

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occur at post-harvest and processing levels, while in industrialized countries more than 56 percent of losses happen at retail and consumer levels (World Bank, 2014). About 5.5 percent of the total procured foods are wasting in Bangladesh. Of the total wastage, 3 percent is being made during procurement and preparation stage, 1.4 percent during serving, and another 1.1 percent from the plates (Nazneen, 2016).

Household food waste has a higher accumulated environmental impact than food wasted in the other chains. The fact is that the later a product is lost or wasted along the supply chain, the higher the environmental cost, as impacts of processing, transport or cooking are added to the initial production impact (FAO, 2013).

Food waste reduction is a promising avenue for decreasing food waste and there is a growing body of literature that investigates consumers' food waste behavior and its determinants (Visschers et al., 2016). Even

so, compared to research on the quantity of wasted food, and the global impact of the food system, studies of household food waste behavior are much less prevalent. Therefore, there is more work to be done to fully understand the determinants of food waste behavior, and that the insights additional research could bring will provide a much stronger basis for efforts to promote food waste reduction at the household level.

As households are the biggest food waste producers, several studies have aimed to investigate consumers' perceptions and behaviors related to food waste. At present, the topic has not received much research attention, and a comprehensive model that can explain household food waste behavior is still lacking. Therefore, in order to reduce food waste of rural household, it is necessary to have an in-depth understanding of the factors shaping food waste-related perception and behavior in the household people.

Methodology

The study area confined to Mymensingh sadar upazila. The upazila consists of one municipality and 13 union parishads. In Mymensingh sadar upazila there are 140 Common Interest Groups (CIGs) of farmers of which 42 are exclusively women CIGs. CIGs were those groups whose members possess more or less same socio-economic status having same or similar professional/working interests. The groups were formed by the National Agricultural Technology Project Phase-1 of DAE during 2008-2013. There are four women CIGs in each union. Accordingly, Bhabkhali union was randomly selected as the locale of the study and all the four women CIGs of Bhabkhali union of sadar upazila under Mymensingh district were selected as

population of the study. Each CIG consists of 20 women members and thus, the total number of respondents stands to 80 women of four CIGs. Data were collected through interview schedule from the women of the selected village during 1 April 2018 to 20 April 2018. The additional information gathered from the FGD (Anonymous, 2003 and Popham, 1993) was used for interpreting the results of the survey.

Selected characteristics of the respondents were measured by using suitable measurement procedures. The focus variable of this study was food waste behavior of rural women. Food waste behavior means behavior related to food and how people see food as part of their daily life. Ajzen (1991) made a behavior

related theory named as the Theory of Planned Behavior (TPB). TPB predicts an individual's intention to engage in a behavior at a specific time and place. It suggests that behavior is directly determined by intentions, which in turn are predicted by attitudes, subjective norms, and perceived behavioral control (Ajzen, 1991). Many studies were conducted by following this theory to measure food waste behavior (e.g. Russel et al., 2017; Laven, 2017 and Visschers et al., 2016). The aspects were measured on a five-point rating scale. Scores were assigned as '0', '1', '2', '3' and '4' for 'never', 'rarely', 'sometimes', 'very often' and 'always' respectively for a total of 23 activities.

Thus, a total score of a respondent might vary from '0' to '92' in this scale, where '0' indicated poor status and '92' indicated good status of household food waste behavior. Relationship between the food waste behavior of rural women and their selected characteristics was computed through Pearson's Product Moment Correlation Coefficient (r). Problems of rural women in reducing food waste were measured through 4-point rating scale. Score was assigned as score of '3', '2', '1' and '0' was assigned to indicate extent of problem as 'high', 'medium', 'low' and 'not at all' respectively of problems faced by the rural women.

Findings and Discussion

Food Waste Behavior of Women

The score of food waste behavior of women in the rural household could range from 0-92, while observed score ranged from 32 to 62. The mean was 50.04 with a standard deviation of 8.53. Findings in the Table 1 showed that the highest proportion (81.9 percent) of the women had fair status while 19.1 percent had good status in food waste management in the rural household. All the women play fair to good contribution of food waste management in the rural household.

Table 1 Categorization of food waste behavior status of women in the rural household
Score Range: possible= 0-92 and observed= 32-62

Categories of food waste behavior (score)	Respondents		Mean	Standard Deviation
	No.	%		
Poor (≤ 31)	0	0	50.04	8.53
Fair (32-60)	65	81.9		
Good (> 60)	15	19.1		

Women often play a greater role in ensuring nutrition, food safety and quality, and are also responsible for processing and preparing food for their households (Opara, 2010). So, women were little involved in food waste management at household level. The household food waste can be reduced by proper management and timely distribution of foods among the household members. The respondents supported their family members, as well as they had been trying to ensure all the household chores to ensure minimizing the household food waste.

The status of food waste behavior of rural women has been examined by computing rank order through status score of the women are shown in Table 2. Data show that status score of the women of twenty 23 activities in household food waste ranged from 0 to 368 against a possible range 0 to 368. The value of status score of one activities exceeded 250 and six activities exceeded 200, the value of eight activities exceeded 150 and eight activities was exceeded 100.

Table 2 Ranking of the issues of food waste behavior of rural women

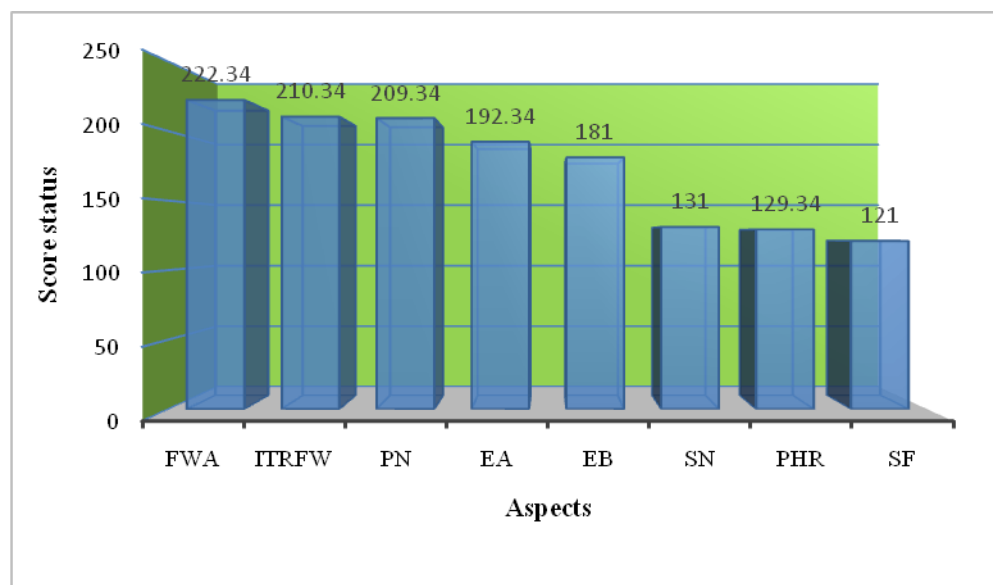
Issues	Score	Rank
<i>Intention to reduce food wastage</i>		
I try to eat all food that I have taken myself.	263	1
I intend to not throw food away.	203	2
I try to leave as little food as possible.	165	3
<i>Food waste attitude</i>		
Wasting food is not a good habit.	237	1
It is immoral to discard food while other people in the world are starving.	228	2
It upsets me when leftover food from the plate ends up in the waste bin.	202	3
<i>Personal norms</i>		
Leaving leftovers give me a bad conscience.	248	1
I have been raised to eat all food have taken myself.	191	2
I feel guilty about poor people when I leave leftover food.	189	3
<i>Subjective norms</i>		
People who are important to me think that I am greedy when I try to eat all food that I have taken myself.	160	1
People who are important to me think it is unnecessary to reduce the amount of food waste.	102	2
<i>Environmental beliefs</i>		
We are approaching the limit of the number of people the earth can support.	194	1
The earth is like a spaceship with very limited room and resources.	168	2
<i>Environmental attitudes</i>		
One should not load the environment with food waste.	224	1
Wasting food would make me feel guilty about the environment.	184	2
I think there is an environmental concern with food wastage.	169	3
<i>Perceived health risk</i>		
I believe that the risk of becoming ill is a result of eating food past.	142	1
I am not worried that eating leftovers results in health damage.	128	2
I think consuming left over is harmless.	118	3
<i>Situational factor</i>		
The food did not taste good.	135	1
I am in a hurry and do not have time to finish my meal.	128	2
The food did not appeal to me.	117	3
I am full.	104	4

However, the top four contributions of food waste behavior of women in rural household have been discussed here. The

first one (263) was related to intention. Since all the respondents were from rural area, their main intention was to try eat all

food that they prepared or collected. The second one (248) was related to conscience. Most of respondent thought that food waste was a bad conscience. The third one (237) was related to habit, they thought food waste is a bad habit. So, they try to less food waste. The fourth one (228) was related to morality. Most of the women thought that food waste was immoral where other people starving. So, they try to reduce food waste.

Figure 1 shows that the highest status score (222.34) of women to reducing different aspects of food waste behavior was in food waste attitudes followed by intention to reduce food wastage (210.34), personal norms (209.34), environmental attitudes (192.34), environmental beliefs (181), subjective norms (131) perceived health risk (129.34) respectively and the lowest status of women to reducing different aspects of food waste behavior was in situational factor (121).



FWA= Food waste attitude, ITRFW=Intention to reduce food wastage, PN= Personal norms, EA= Environmental attitudes, EB= Environmental beliefs, SN= Subjective norms, PHR= Perceived health risk, SF= Situational factor

Figure 1 Comparison of different aspects of household food waste

Most of the women play highest contribution in food preparation because for food preparation no extra cost is required. Since most of them were educated and they were very careful to manage to reduce their food waste in a proper way.

Relationship between the Selected Characteristics of Rural Women towards Food Waste Behavior

Among eight characteristics, household size and training exposure of the rural women were positively correlated with the behavior towards their household food waste. Only

annual family income was negative correlated with food waste behavior. Other characteristics of the rural women were not

significantly correlated with household food waste behavior (Table 3).

Table 3 Relationship between the selected characteristics of rural women and their behavior towards food waste

Personal characteristics of the rural women	Correlation Co-efficient (r) with 78 df
Age	-0.171
Years of schooling	-0.027
Household size	0.021
Household farm size	0.422**
Annual family income	-0.411**
Training exposure	0.284*
Organizational participation	0.105
Decision making capacity in the family	0.065

*Correlation significant at 0.05 level (2-tailed); ** Correlation significant at 0.01 level (2-tailed)

Tabulated values (r) significant with 78 df: 0.217 (at 5%) and 0.283 (at 1%)

FWA= Food waste attitude, ITRFW=Intention to reduce food wastage, PN= Personal norms, EA= Environmental attitudes, EB= Environmental beliefs, SN= Subjective norms, PHR= Perceived health risk, SF= Situational factor

It also found that annual family income and food waste behavior was negatively significant. Rich people purchase more quantity of food as they have more money. So, the supply of food to them becomes diversified with high quantity. Hence, there might have possibility of wasting food during the course of their intake. Thus, the behavioral expression of food waste for rich households becomes negative.

Again it found that training exposure of the women and food waste behavior was significantly positive. It implies that with the increase training exposure, behavior towards managing the food wastes become well. Because they get more lesson and experience from various training program about various aspects of behavior towards

the managing food waste. Therefore, it could be said that better training exposure of the rural women played significant role to managing the food waste by change their behavior.

Problems Faced by the Rural Women to Reducing Household Food Waste

Problems faced by the rural women in household food utilization were measured through fourteen selected items of problems with a four-point rating scale. The observed score of the problems faced by the rural women in household food utilization ranged from 12 to 24 against a possible range of 0 to 36. Data presented in Table 4 showed that the mean and standard deviation of this score was 13.34 and 1.68 respectively.

Table 4 Categorization of rural women based on their problems faced in reducing food waste
Score Range: possible= 0-27 and observed= 12-24

Respondents			Mean	Standard Deviation
Categories	No.	%		
Low (≤ 9)	0	0		
Medium (10-18)	67	83.8	14.89	3.41
High (> 18)	13	16.2		

The highest proportion (83.8 percent) of the respondents in the study area faced medium extent of problem, while the rest 16.2 percent of the respondents faced high extent of problem towards food waste behavior and none of the respondents in the study area faced low level of problem. This means that almost all of the respondents faced similar problems to similar extent. This might be due to the similar socio-economic background of the respondents.

Data furnished in the Table 5 indicated that the problem which ranked first was "Insufficient money for purchasing different food preserving material" followed by second one "Lack of food storage facilities" and third one "Lack of proper sanitation facilities". "Social and religious restrictions

or prejudice" was the least important problem among those faced by the rural women to reducing their household food waste.

Since all the respondents were from rural area and their income was low, so they could not afford to purchase food preserving materials. That is why the problem of "Insufficient money for purchasing different food preserving material" ranked first. In the study area few households had fridge of their own but maximum households could not afford to buy fridge of their own where they could store their household food materials. So, "Lack of food storage facilities" ranked second.

Table 5 Rank order of the problem faced by the rural women to reducing household food waste

Problems faced by the women	Extent of the problems				Score	Rank Order
	High	Medium	Low	Not at all		
Insufficient money for purchasing different food preserving material	33	39	8	0	185	1
Lack of food storage facilities	16	31	33	0	143	2
Lack of proper sanitation facilities	14	37	26	3	142	3
Deficiency of knowledge of different aspects of household food waste	7	47	26	0	141	4
Lack of educational facilities regarding proper household food preparation	0	57	22	1	136	5
Difficulty in preserved food due to lack of electricity/interrupted supply of electricity.	12	28	39	1	131	6
Lack of personal interest in proper way to reduce food waste	3	32	43	2	116	7
Non-cooperation of household members	5	15	59	1	104	8
Social and religious restrictions or prejudice	3	24	25	28	82	9

Towards solving these problems, they suggested that if government and non-government organizations take initiatives to involve rural women in different income generating activities, they would be able to increase their household income which will help them to purchase nutritious food materials, food preserving material etc. Awareness developed through training will also help them to increase their decision-making ability regarding household food management. Training and educational facilities should be provided to the rural women regarding food waste, so that they can broaden their outlook and able to take

part in minimizing their household food waste effectively.

When GOs and NGOs provide easy and low interest credit facilities to the rural households they will be able to buy different food storage material which will help them to increase their food storage facilities. If health workers stay in the clinic regularly, rural women will be able to increase their sanitation facilities through consultation with health workers. From their practical view point, they set forth the following recommendations to overcome the constraints shown in Table 6.

Table 6 Suggested solutions with way to achieve solutions

Suggested solutions	Way to achieve
Involving rural women in different income generating activities to increase their household income	Government and private organization should take initiatives to create different sectors that help them to increase their household income
Easy and low interest credit facilities should be provided by different GOs and NGOs so that they could buy different food preserving material	Bangladesh Krishi Bank and other NGOs who operate microcredit program may extend their cooperation in this regard
Training and educational facilities should be provided regarding household food waste	Needs GOs and NGOs collaboration
Uninterrupted supply of electricity should be ensured in the locality	Government should ensure supply of electricity in the locality
Information about nutritious food and awareness program regarding this should be provided	GOs and NGOs can help by providing proper information about food and make people aware about it
Health workers should stay in the clinic regularly	Health Department should set strict rules and regulations regarding health workers activities
Family bonding should be strengthened	Collaboration between family members can strengthened family bonding

Conclusions

The fair status of behavior towards food waste of rural women should be increase by enhancing training exposure and awareness towards food waste. Government and non-government organizations (GOs and NGOs) may take appropriate initiatives to create diversified income generating activities at household level so that rural women would engage them in such activities to increase their annual household income and could play important contribution to reduce their

household food waste by purchasing preserving materials. Government and non-government organizations should conduct training and awareness programs according to need of rural women for increasing their awareness, management skill and operational ability for practicing to reduce their household food waste.

Household farm size, annual family income and training exposure were some the personal characteristics of the women found

to be significantly linked to their behavior towards household food waste. In formulating any action plan for the women regarding such activities, at least these issues might be considered on priority basis. Rural women of the study area faced various types of problems significantly towards managing the household food waste properly. Department of Agricultural Extension, Ministry of Health and other

NGOs working in that area may motivate household members to make them aware of the proper way to reduce food waste and try to solve their problems themselves. Further, steps may be taken by these organizations to assist rural households to solve the problems which the households cannot solve without technical and financial cooperation from the organizations.

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