



Residents' Preparedness in anticipation of the Nankai Trough Megathrust Earthquake: Regional Disaster Plan for Stockpiles

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Abstract

After the disaster, food and water were in very short supply in the tsunami-devastated region of the Great East Japan Earthquake. There was an acute shortage of food and drinking water, in the 2016 Kumamoto Earthquake. During a large-scale disaster, the supply chain is thrown into disarray and it is difficult to get food at the local level. Local governments are supposed to secure storage facilities and stock basic needs for life of evacuees. The government urges citizen to build home-stockpiles of at least one week. In this study, we conducted the questionnaire surveys about the disaster stockpiles at homes in some areas in Japan to clarify the residents' preparedness of at-home stockpiles in anticipation of Nankai Trough Megathrust Earthquake that predict the occurrence within a couple of decades. There is not enough food stock and supplies in many homes. More than half of university students living alone did not stockpile at all. Key factors behind the decision to stock are different depending on the area. These results show that there are many factors that should be considered in the regional disaster plan.

Keywords: Stockpile, Great earthquake, Preparedness for residents

1. Introduction

In the affected areas of the Great East Japan Earthquake, it took a long time to supply goods to many victims because of loss of stockpiles by the tsunami, communication interruption, delay of food transport from outside of the district due to damage the roads and fuel supplies for transport vehicles [1, 2]. In the final report on the Nankai Trough Megathrust Earthquake countermeasures by the Central Disaster Prevention Council, home stockpiles at least one week are needed[3]. However, the current situation seems that stockpiling at home is not enough. And discussion of stockpiling is difficult because there are different types of disaster and different situations by the area. In this study, we conducted the questionnaire surveys of the disaster stockpiles at homes in some areas in Japan to clarify the residents' preparedness of at-home stockpiles in anticipation of Nankai Trough Megathrust Earthquake. We have questions about contents and amount of food stockpiles, stockpile start time and reason, disaster experience, family structure and district. There are many people who are stockpiling a few days' worth of food, but there are few people who are stockpiling more than one week's worth. In addition, it was found that some families had no stockpile at all, and many university students living alone did not stockpile. One big reason for not stockpiling was that such people think things would work out after disasters. Many people in the Kanto region started the stockpiles after the Great East Japan Earthquake. On the other hand, a relatively large number of people in the vicinity of the Kansai region started the stockpiles after the Great Hanshin-Awaji Earthquake. However, some people stockpiled only at that time and stopped it after a while. The sense of crisis increases immediately after big disasters, but after a while that gradually fades. Some people started stockpiling in the wake of disaster prevention lectures and television programs. It was found that there are differences in the stockpile situation by region and family structure. It is important to consider the stockpile depending on the regional characteristics and the actual situation of family.



2. Method

After the Great Hanshin-Awaji Earthquake in 1995, many ordinary citizens started keeping emergency stocks of food at home. However, some people stopped stockpiling over time. And after the Great East Japan Earthquake in 2011, many citizens started stockpiling food at home again. Citizens in the area where the great earthquake took place are temporarily taking more interest in disaster preparedness. This study was conducted at several lectures and events for disaster prevention in Tokyo, Kanagawa, Gifu, Tokushima, Kyoto and Osaka between June 2014 and May 2015. 384 ordinary citizens and 468 university students were sampled.

Self-administered questionnaires were used to collect data about contents and the amount of food stockpiles, stockpile start time and reason, disaster experience, family structure and district. The main questions are as follows:

- (1) How much food stock have you stored in preparation for disaster?
- (2) How long can your family survive with your stockpile at home?
- (3) What kind of food reserves do you stockpile?
- (4) What influenced you to keep an emergency stock of food?
- (5) Do you have an experience with a disaster?
- (6) Where do you live?
- (7) Please tell me about your family members.

3. Results

Table 1 presents the demographic characteristics of the survey respondents. We compared regional difference, gender difference, generation difference in emergency stockpiling at home. Figure 1 indicates the location of the survey region.

Table 1. – Demographic characteristics of the survey respondents

Category	Item	ordinary citizens (N=384)	University students (N=468)
Region	Tokyo	43	35
	Kanagawa	60	
	Kanto region (except Tokyo and Kanagawa)	23	
	Gifu	131	-
	Aichi	65	-
	Kyoto	-	55
	Osaka	-	139
	Kansai region (except Kyoto and Osaka)	-	54
	Tokushima	63	185
Gender	Male	184	306
	Female	174	157
	Unclear	26	5
Age	18-19	-	267
	20-39	35	199
	40-59	115	-
	60-69	120	-
	70-	107	-
	Unclear	7	2

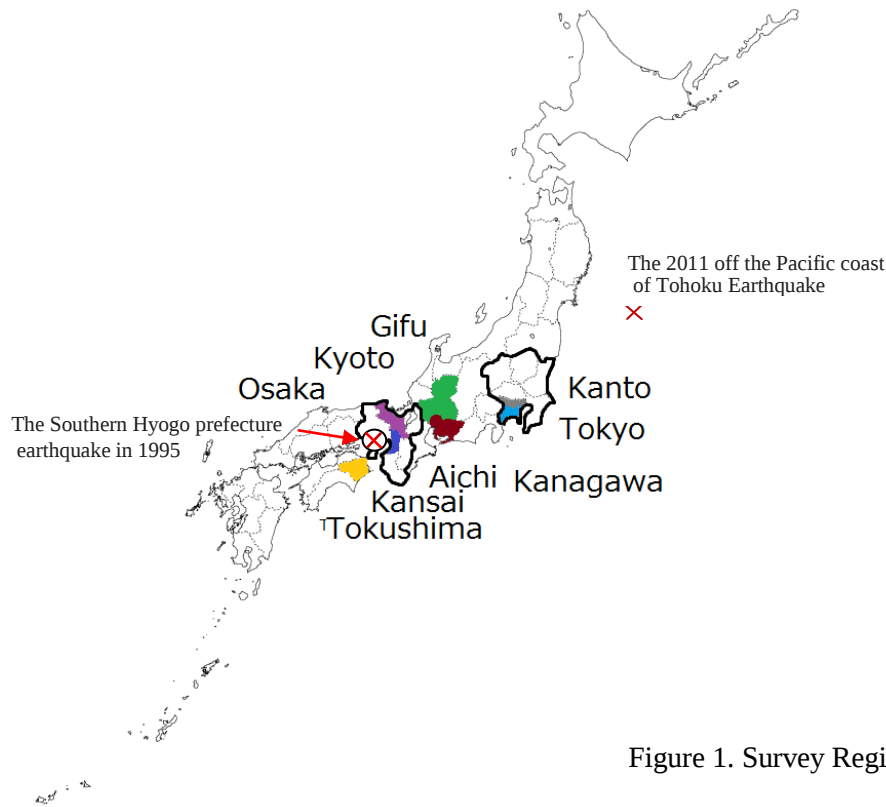


Figure 1. Survey Region

It was found whether food stockpiles are considered sufficient as can be seen in Figure 2 and Figure 3. Figure 4 reveals a correlation between actual amount of food stockpiles and ordinary citizens' ideas about quantity, but there is no correlation between actual amount of food stockpiles and university students' ideas about quantity. The majority of the ordinary citizens of respondents were senior citizens, and they took part in events for disaster prevention, so it is considered that their awareness of home-stockpiles is high. By contrast, the university students of respondents were around 20 years old and around 50% of them started living on their own since entered the university, so it seemed that they understood little how much food is needed for an emergency. Senior citizens had better understanding of necessary amounts of food for each person per day, while university students showed poor understanding of necessary amounts of stockpiled food.

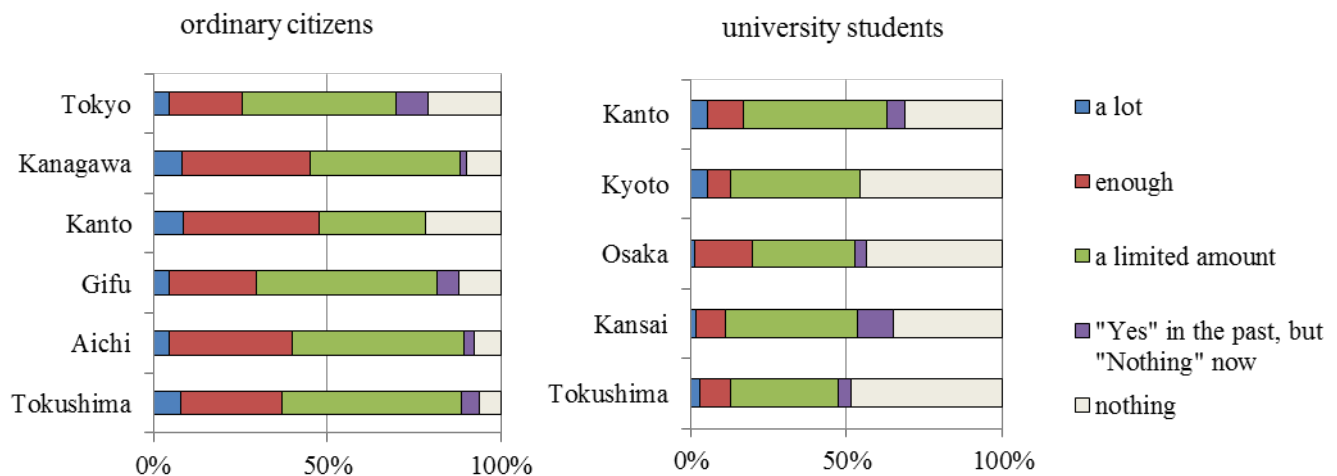


Figure 2. How much food stock have you stored in preparation for disaster?

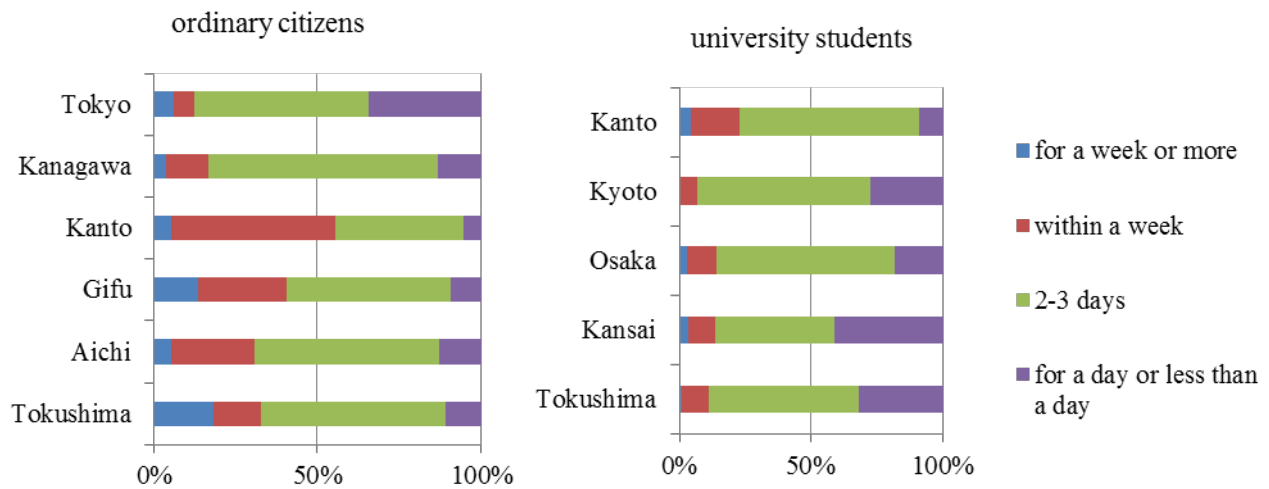


Figure 3. How long can your family survive with your stockpile at home?

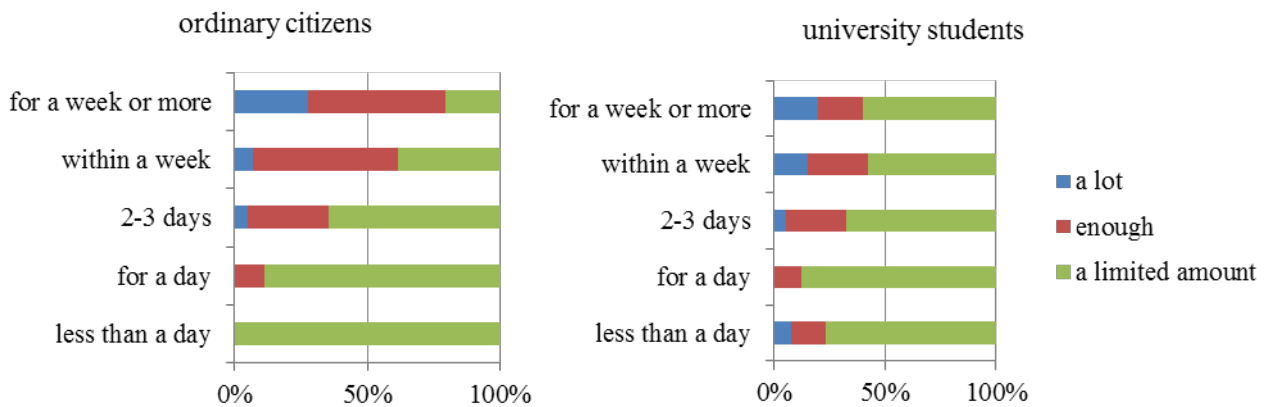


Figure 4. The relationship between quantity of stockpile and respondents' thinking

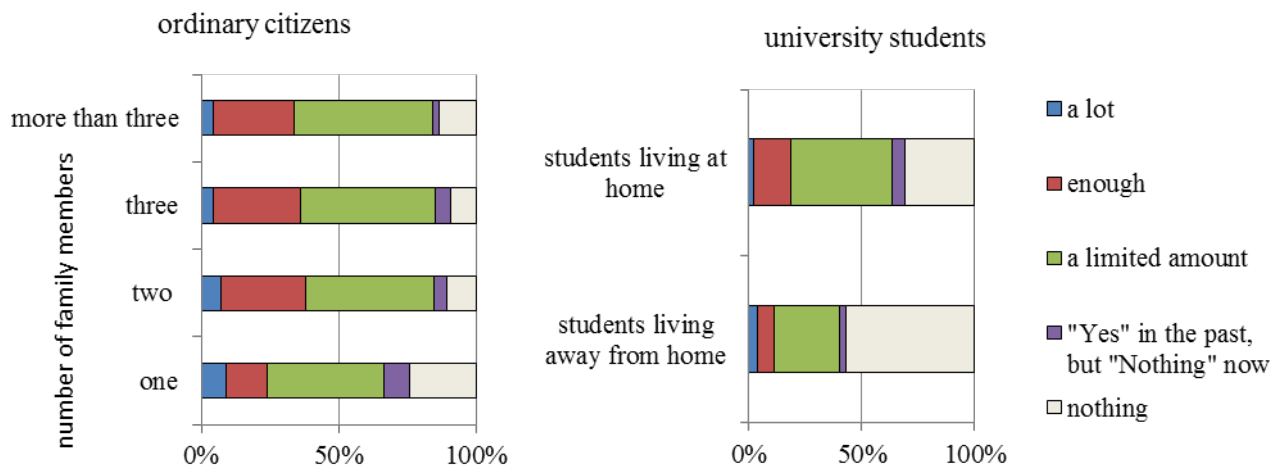


Figure 5. The relationship between quantity of stockpile and family composition



People living alone do not keep much stockpile of supplies, as shown in Figure 5. More than 60% of students living at home keep a stockpile at home, while 60% of university students living away from home do not keep a stockpile at all. The single-person household rate becomes higher in Japan, so disaster preparedness of single-person households should be considered in a regional disaster plan.

We asked a question to find what people's motive for stockpiling at home was (Figure 6). The nearer the respondents lived to the epicenter of the Great Hanshin-Awaji Earthquake, the higher the percentage of people who stockpile for it is. On the other hand, the biggest reason that people in the Kanto region started stockpiling at home is the influence of the Great East Japan Earthquake. Many university students in Kanto answered that they started stockpiling food at home in the wake of the Great East Japan Earthquake. From these results, it was found that the nearer a disaster-stricken area, the higher the concern about disaster preparedness. Many university students are encouraged to keep stockpiles by their parents. Many students answered that they do not stockpile on their own, but their parents keep stockpiles of supplies at their home.

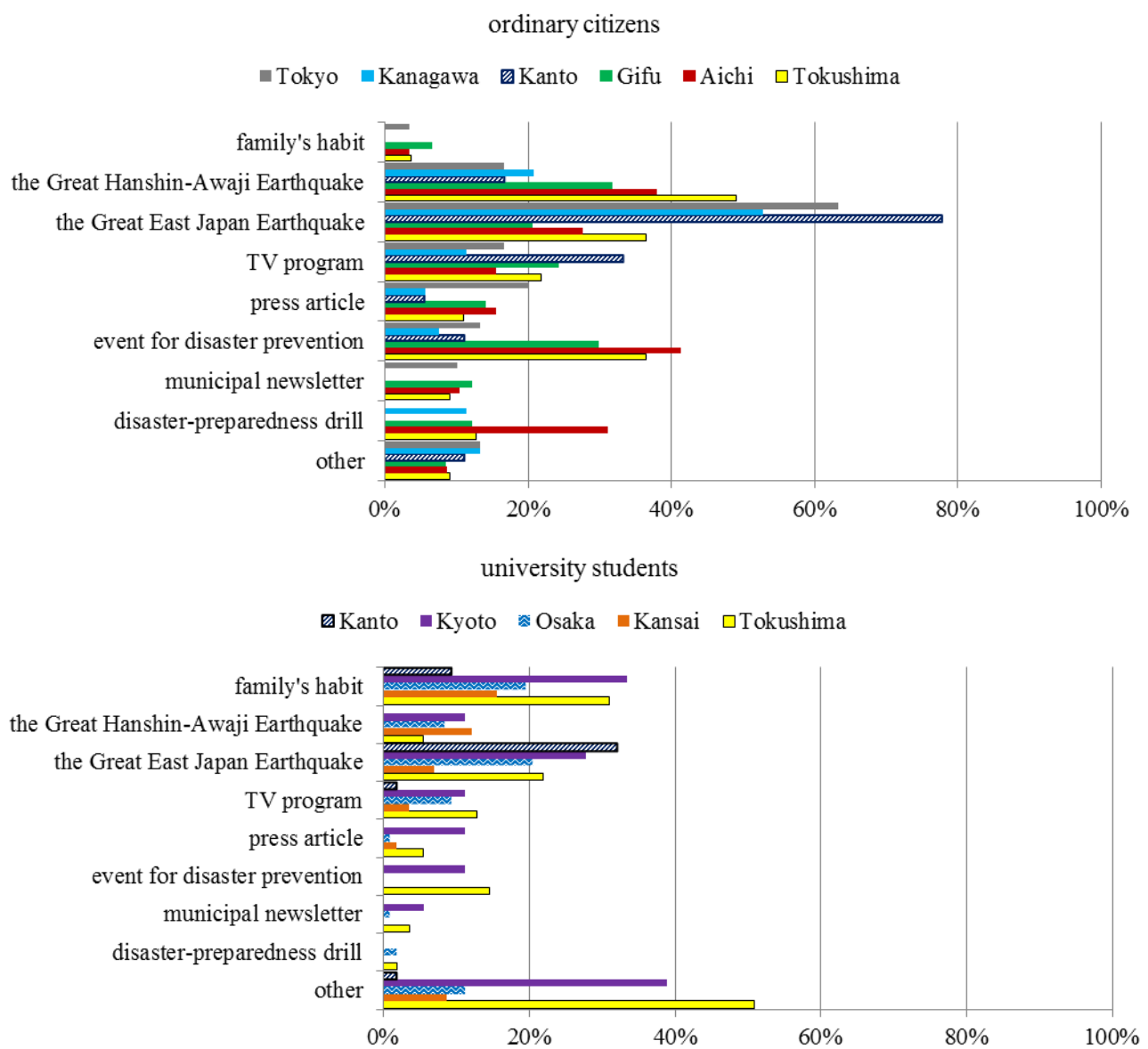


Figure 6. What influenced you to build an emergency stock of food?

Figure 7 shows the category of emergency stockpiling at home by region. In the past hardtack was well known as long life food for emergency, but ready-to-eat foods are now mainstreams instead. If today's emergency foods are heated a little, they become easy to eat. So we asked whether they have a heat source. Many ordinary citizens did, but university students did not. There is a higher percentage of ordinary citizens in provincial cities keeping heating oil in their homes.

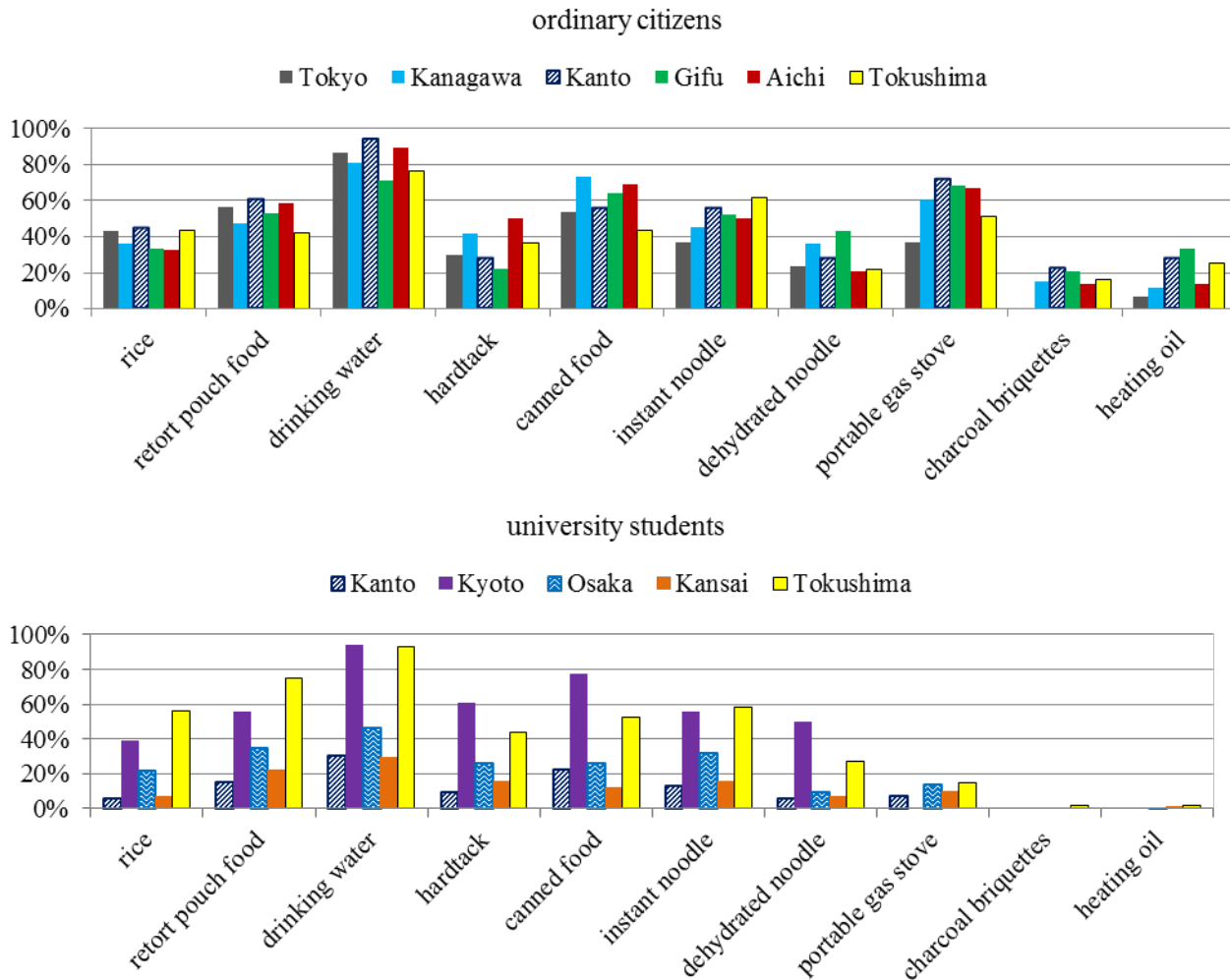


Figure 7. What kind of food reserves do you stockpile?

Many university students don't keep a stockpile of supplies at home. We found out the reason for this as shown in Figure 8. The most common reason for male students is the impression that they will manage somehow if a disaster happens, such as people who live alone have a lower consumption of food. The second most common reason for male students is the feeling that it is too much trouble. This is a little more complicated; it is difficult to manage the expiration dates of the product. The most common reason for female students is no knowledge on what to prepare for an emergency. There were many responses that they had never thought about stockpiling among other reasons. They have little reason to think a major disaster will not happen in their area.

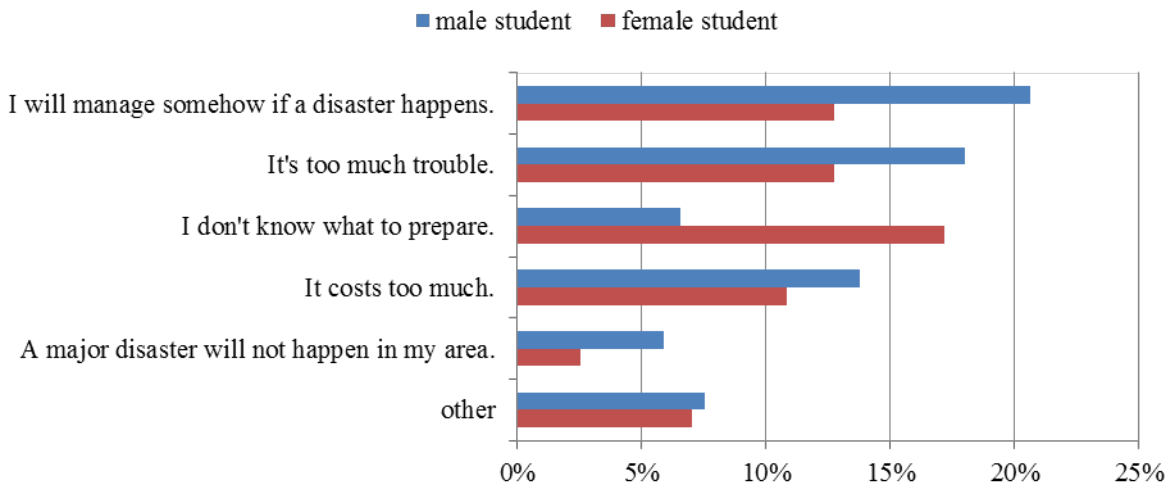


Figure 8. Why do you keep no stockpile at home?

4. Conclusion

It is expected that the Nankai Trough Megathrust Earthquake would create more damage than the Great East Japan Earthquake. The government has pushed citizens to keep an emergency food, water and fuel supply for a week at home. Because emergency evacuation areas cannot afford enough space for all citizens, and it takes a long time to transport emergency relief goods during a distribution network disruption. From the investigation, it was clarified that great earthquakes led citizens near the epicenter of great earthquakes to stock emergency food supplies. Activities to raise awareness for disaster prevention such as TV programs, press articles and municipal newsletters help a little. Because people who live alone, especially university students are often not affiliated with a neighborhood association, they cannot receive a local municipal newsletter and do not catch information for disaster prevention. If citizens could attend an event and a drill for disaster prevention, this could be beneficial. However, there are not many people taking part in them. For university students, the recommendations by their immediate community of family and friends may be more effective. Contents of emergency food are modified to be easy to eat, as it was difficult for elderly people to have hardtack that was major emergency food in the past. Considering changes in Japanese population composition and family composition, it is important to develop not only self-help efforts but also mutual assistance approach.

5. References

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