

【 論 文 】

The Systemization of Radioactivity Inspection for Food Products and Steps to Counteract Reputational Damage in Fukushima, Japan

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Abstract

In this paper we first examine the meaning and usage of the term “Reputational Damage” related to food and agricultural products in Fukushima Prefecture. Then, we propose the way to tackle radioactive contamination and recover Fukushima’s agriculture. Two key concepts are : promoting evidence-based, rather than emotion-based communication with consumers ; making radioactive countermeasure complete and systematic, covering from farmland screening to product inspection.

Keywords : Reputational Damage, Evidence based communication, Systematization of radioactive countermeasures

Introduction

Two and a half years after the Great East Japan Earthquake, Fukushima Prefecture continues to confront the aftermath of nuclear disaster. In addition to ongoing efforts to stabilize the damaged reactors and deal with radioactive contamination, the region must also deal with the associated but less tangible problem of stagnated sales of Fukushima produce as the alleged result of “reputational damage.” The term “reputational damage,” also called “*fuhyo*” in Japanese, describes a situation where the reputation of people, place or products is tarnished by rumors, reports in the media and all sorts of information. In Fukushima, reputation-tarnishing rumors or information have been portrayed as the source of the region’s current agriculture woes. Accordingly, the central and prefectural governments have implemented various campaigns aimed at swaying the emotions of consumers in favor of purchasing produce from Fukushima. However, the notion that Fukushima’s agricultural stagnation is the result of reputation tarnishing rumors or information deserves careful and sustained scrutiny.

In this paper we first identify and compare the state of initial and current food safety measures. In 2011, the year following the nuclear accident, radioactive contamination countermeasures and food inspection procedures were seen by consumers as unacceptable. As of 2013, however, measures to counteract radioactive contamination and the food inspection system have been significantly improved. In section one we argue that it is imperative to first recognize the important differences between the initial and current phases of food inspection and to implement evidence-based communication, rather than campaigns targeted at consumer emotions. Yet it is also necessary to concede that current measures remain lacking, primarily as a result of the inadequate systemization of individual countermeasures. In

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section two we discuss this point and propose an alternative scheme. The final section describes how to effectively restore consumer trust regarding food safety. We conclude by introducing a project in which consumer co-operatives from all over Japan dispatch employees to Fukushima to take part in the soil screening activities of the local agricultural co-operative. As this case illustrates, consumers are not affected by emotional slogans, but rather by information and evidence-based communication.

1. Current status of “reputational damage”

While definitions of “reputational damage” in relation to agricultural products vary, they all share the assumption that the agricultural products in question are in fact safe. For example, a governmental document entitled “Interim Guidelines for Reputational Damage Stemming from the Impacts of the Nuclear Disaster,” published by the Ministry of Education, Culture, Sports, Science and Technology published in August 2011, defines “reputational damage” as “any damage caused by negative publicity leading consumers and associated businesses to forego purchasing products or services based on fears of radioactive contamination.”¹ Thus, according to this definition, reputational damage refers to a situation where agricultural products that are free of radioactive contamination are avoided by consumers as a result of rumors of contamination, resulting in negative impacts for agricultural producers. As can be seen, definitions of “reputational damage” assume a situation where the security of food and agricultural products is verified and reputational damage stems from rumors of contamination.

The term “reputational damage” implies that damage accrues only to agricultural producers and that consumers are in contrast the source of any damage. However, it is inappropriate to describe the situation in Fukushima in 2011 as “reputational damage”. By framing the issue as a rift between producers and consumers, the discourse of “reputational damage” problematically minimizes the severity and complexity of the problem. Viewed through the frame of “reputational damage,” farmers are the victims and consumers are the antagonists. In fact, however, in 2011, consumers who refrained from purchasing Fukushima produce, basing their decisions on non-objective rumors, were also the victims of a food inspections system lacking adequate means of ensuring safety. The antagonist in such a situation is not the consumer, but instead an inadequate system for measuring radioactivity contamination. Indeed, as further explained below, in the initial stage after the nuclear disaster, all individuals and organizations forced to endure inadequate radioactivity contamination measures must be considered victims.

In 2011, it was highly difficult to verify the safety of agricultural products. Policies regarding nuclear energy in Japan were based entirely on a long-standing myth of infallibility. Accordingly, even in a region such as Fukushima where nuclear plants were in operation, only a small number of devices for measurement and analysis of radioactive contamination could be found and the transfer coefficient of crops, that is, the ratio or tendency of crop’s absorption of radioactive material from the soil, was unknown. However, based on only a small number of samples and limited monitoring, authorities issued a proclamation assuring citizens that products were safe and calling on them to support Fukushima by purchasing products from the region.

This was followed by a premature “declaration of safety”. Predictably, however, when products over the standards for radioactivity were discovered, the illusionary edifice on which consumer trust was to be founded quickly evaporated. Even today, despite significant improvements to the safety inspection

¹ The Japanese Ministry of Education, Culture, Sports, Science and Technology (2011) “Interim guideline about reputational damage stemming from the impacts of the TEPCO nuclear power plant accident”.

system in place in Fukushima Prefecture, memories of the first year's troubled campaign remain strong. Behind a hesitancy to purchase agricultural products from Fukushima are the lingering opinions and voices of those who felt they were the victims of a campaign of deception. But are these the voices the propagators of reputational damage? For many on the side of production or testing, the fact that stringent testing fails to indicate cesium even in leafy vegetables marks the ill will of consumers. However, the culprit here is not fantastic rumors, but rather consumer trust sacrificed to expediency. Accordingly the notion of reputational damage does not explain the phenomenon in question. In the first year the assumption of safety upon which "reputational damage" rests could not be met, resulting in a situation of actual damage to consumers and not mere reputation tarnishing rumors.

In contrast, in 2013, we can see much progress in radioactive countermeasures and the openness of test results. One of the major advances in inspection measures can be seen in the case of Fukushima's innovative "all bag" testing for rice. Under a program entitled "Project for Advancing the Safety and Security of Fukushima's Produce", the prefecture has implemented a program to inspect every bag of rice produced under its jurisdiction. In all local areas in the prefecture, local officials have implemented a belt conveyor style testing procedure.

Although the accuracy of this procedure falls short of that of destructive tests, belt conveyor "all bag" testing can, in contrast, serve as a screening measure for each bag of rice bound for the market. Under "all bag" inspection, rice found to contain over 50 Bq per kg can be more precisely analyzed and the results of further testing can be used to inform any decision on whether to allow the product into the market (Table 1).

As illustrated by this result, radioactive countermeasures and inspection have been vastly improved during the past two years and we must stress the importance of communicating such clear evidence to consumers. However, to illustrate that such communication is not adequate, let us look briefly at the result of a consumer survey conducted by Consumer Affairs Agency very recently in 2013 (Table 2, 3).² The survey was conducted by the "Team for the Advancement of Understanding of Consumer Behavior towards Food and Radiation" of the Consumer Safety Division of the Consumer Affairs Agency and was published in October 2013.

Table 1. Results of "all bag" inspection (Aug. 22-Oct. 19, 2013, all of Fukushima)

1) Screening Test by NaI Scintillation Detector (Bq per kg, percent)

	N.D. (<25)	25-50	51-75	76-100	Total
Number of Bags	4,894,821	2,370	68	0	4,897,259
Percentage	99.95	0.05	0.00	0.00	100.00

2) Detailed Test by Germanium Detector (Bq per kg, percent)

	<25	25-50	51-75	76-100	>101	Total
Number of Bags	8	0	109	32	4	153
Percentage in Total Bags	0.0002	0.0000	0.0022	0.0007	0.0001	0.0031

Source : Project for Advancing the Safety and Security of Fukushima's Produce, Fukushima Prefecture, 2013.
<https://fukumegu.org/ok/kome/>

² The Consumer Affairs Agency of Japan, Oct. 7, 2013, "The Second Consumer Survey about Reputational Damage".

Table 2. Responses when asked to indicate knowledge of radioactive materials in food testing (percentage).

	Feb. 2013	Aug. 2013
When an agricultural product over the standards for radioactivity is discovered all of the same products from that municipality are prevented from entering the market or being consumed.	58.8	52.8
Radioactive materials inspection for food products are focused on the 17 prefectures in eastern Japan where the nuclear accident occurred.	15.1	15.7
Inspections are being conducted according to inspection plans created by local authorities which follow the guidelines of the Ministry of Health and Welfare.	26.4	23.1
Following the inspection plans, the results of local authority tests are made public on the homepage of the Ministry of Health and Welfare.	14.2	13.3
Half of all agricultural products found to measure 50 Bq/kg (half of the standard for radioactivity in rice) are subject to further testing.	10.5	10.2
The inspection plans of local authorities incorporate information pertaining to farmland contamination prior to testing of agricultural products.	17.2	18.4
Other.	1.5	1.9
Unaware that testing is being conducted.	22.4	26.1

Source : The Consumer Affairs Agency of Japan, Oct. 2013.

Table 3. How do you feel about receiving doses of radiation too small to verify the health effects ? (Multiple Answer, percentage)

	Feb. 13	Aug. 13
Even if within the standards I would not accept it because just a little can raise your risk of cancer.	16.6	18.9
Since there are many other sources of cancer (such as smoking, more than three drinks per day and underweight), I would not be concerned if within limits.	36.9	34.5
Not worried because there are many other causes of cancer.	21.7	19.3
Other.	2.0	1.8
Without sufficient information, risk is unthinkable.	22.8	25.5

Source : The Consumer Affairs Agency of Japan, Oct. 2013.

When asked to indicate features of the current food inspection system that they are aware of, 52.8% of all respondents (5,176) stated that they were aware that attempts were being made at the local level to prevent food products exceeding the radioactivity in food standards from being distributed or consumed. In addition, while 23.1% of respondents suggested that they are aware that local governments are conducting inspections according to the guidelines of the Ministry of Health, Labor and Welfare, 26.1% of respondents indicated that they are entirely unaware that any inspection is being conducted. Furthermore, only 13.3% of all respondents are aware that the Ministry of Health, Labor and Welfare has published the test results. In other words, even two and a half years after the nuclear disaster, only around 20% of consumers are aware of inspection methods and results while 26.1% of consumers are unaware that inspection is even being conducted.

The Consumer Affairs Agency survey also questioned respondents as to how they would accept health effects from doses of radiation too small for the health effects to be certain. Of total respondents,

34.5% indicated that they would accept such a dose as long as food is subject to current inspection procedures, 25.5% indicated that the lack of information suggests risk is unthinkable, and 19.3% indicated they were not particularly concerned since cancer can develop from many sources other than radioactive material. We can safely say that a certain percentage of consumers want to access the information and the actual contents of the inspection system (e.g. accuracy and reliability, the certification system, trust in public institutions), rather than worrying about whether the risk is more than zero.³ In sum, for policies to counteract reputational damage, the effects of emotional claims about safety or support campaigns will be weak. It is therefore imperative to provide consumers who are seeking accurate information with the appropriate facts.

2. Systemization of Radioactivity Inspection for Food Products

It is still possible, however, to identify remaining factors responsible for the persistence of reputational damage. First, even though inspection is implemented with a certain level of accuracy, it is done without detailed information about soil contamination and thus lacks comprehensive understanding about why contaminated rice was detected from some paddy fields and not from others, or how to tackle the contamination problem in crops. The inspection effort is incomplete. Second, for products other than rice, inspection is based only on sampling. To improve the representativeness of samples and accuracy of tests, it is imperative to systematically collect data on farmland contamination and the transfer coefficient of specific products and to construct an inspection system based on this data. Despite efforts to implement risk communication, if concerns remain over the accuracy or comprehensiveness of inspection distributors will tend to avoid purchasing products from areas where such inspection regimes are in

³ Underlying this analysis is hypothetical classification of consumers into four categories (A-D) based on their differing perceptions of safety. Type A individuals are in pursuit of zero risk. Individuals falling into this category react only to the potential for food products to contain radioactive materials. They are uninterested in whether inspection is conducted, the degree of accuracy or the results, but instead exhibit concern over products produced in the area where the nuclear disaster occurred and avoid purchasing merely on the mention of the name "Fukushima". Type B individuals are conscious of the standards for radioactivity in food and their behavior corresponds to a products relation to the current standard of 100 Bq/kg. If a product is within this limit, they feel safe and secure. However, if they feel the limits are too high, then they will show concern. That is, their behavior is dependent on their interpretation of the standards as appropriate or not. Thus, while some type B consumers felt safe because standards were more stringent than the US or Europe, others were concerned that they were not as low as those of Belarus. Type C individuals focus on the inspection system. Individuals in this group base their decisions to purchase on their confidence in the inspection system as a whole, including whether inspection is conducted at the stage of production, shipment or distribution, or whether inspection is based on holistic testing or sampling. For this group questions and lack of trust over the inspection system at large becomes an issue. Type D individuals are either entirely unconcerned or proactively supportive ; the former purchase products with little concern for radioactive materials and the latter actively seeking out products from Fukushima as a means of supporting recovery efforts in the area. Hypothetically, it is suggested that type D is 19.3% and type C is 34.5%. Also, within type C, 25.5% of these respondents indicated a lack of information leads to low concern of risk. Although detailed analysis is lacking and this is hypothetical, it seems that the number and percentage of types A and B are rather small and the majority of consumers fall into type C, or individuals who focus their concern on the overall inspection system. More detailed analysis is necessary.

place.⁴

Third, Fukushima Prefecture has not pursued a policy of promoting local consumption of locally produced goods but has instead opted to send its goods outside the prefecture. Thus while the situation remains such that Fukushima citizens avoid local products, and local schools sometimes do not use local products, it will of course remain highly difficult for Fukushima farmers to convince people outside the prefecture to purchase and consume agricultural produce from Fukushima. The key is not to rely on soothing the emotional state of mind of consumers with safety image, but rather to construct a food inspection system that, first and foremost, ensures confidence in the local consumption of locally produced goods. Fourth is the issue of concerns over whether the radioactivity standards correspond with testing procedures. While soil testing is possible for some agricultural products, this is not the case for food products from marine environments. While it is possible to do “all bag” inspection for rice, mushrooms can only be sampled. While there are products raised in fields, there are also food products from the forest. While rice is eaten everyday, there are also seasonal foods only rarely consumed. These very different food products are problematically subjected to the same standards. It is imperative to construct a food inspection system that takes into account both consumption habits for particular foods and the possibilities of testing for contamination.

What these problems serve to indicate is that measures for counteracting damage to reputation from harmful rumors are not about simply comforting consumers. Dealing with reputation entails creating maps of radioactive material distribution and building a rational inspection system that accounts for migration rates and is based at the production level. It must allow consumers to objectively identify the safety of agricultural products.

One of the key problems is the lack of unification of testing systems and procedures. On April 1 2012, the provisional standard of 500 Bq per kg of radioactive cesium for food products was lowered to 100 Bq per kg. However, since the central government failed to introduce any specific guidelines for implementation alongside the introduction of these new standards, agricultural areas such as Fukushima were forced to respond to the new measures on their own. For example, Fukushima Prefecture has, of its own initiative, sought to improve its pre-shipment inspection of agricultural products by increasing sampling rates and has attempted to implement a thorough inspection system. However, even as radioactive contamination has spread well beyond Fukushima, the lack of clear guidelines from the central government has led to a situation where the accuracy and organization of radioactivity measurements have been conducted in different ways from region to region. For example, while Fukushima Prefecture categorizes any agricultural product under 10 Bq per kg as “Not Detected”, this category is in fact based on devices and test systems that vary from place to place. This lack of unification of testing systems is one of the main sources of lingering fears of risk among consumers and thus one of the key drivers of reputation harming rumors.

To improve testing systems, it is imperative to first recognize that the issue of radioactive contamination is not limited to Fukushima Prefecture. In the current system, policies are different from prefecture to prefecture. To correct this we must establish laws, regulations and a nationally unified inspection system. It is necessary for these laws and regulations to be based on well-organized connections between tests conducted by local government and agricultural cooperatives and the monitoring con-

⁴ See R. Koyama (2012), “Farmland Radiation Dose Distribution Map and Food Safety Inspection Systematization,” *Journal of Commerce, Economics and Economic History (THE SHOGAKU RONSHU)*, 81(2), for further discussion of this point.

ducted by the national and prefectural governments. It is also necessary to further divide and assign the responsibilities of these institutional entities. For example, it is imperative to consider whether it would be best for agricultural cooperatives to conduct screening of farmland, and for the national and prefectural governments to conduct pre-shipment monitoring. Furthering the division of labor in testing would not only help to avoid the current system of overlapping tests in which the same specimens are measured by multiple devices, but would also allow for the effective and efficient use of these devices. As the division of labor between the national and prefectural governments and the local government and agricultural cooperatives is clarified, and the role of screening and monitoring is more rationally organized, the accuracy of testing can be increased without adding any additional labor burdens. In addition, there is an urgent need to produce an inspection manual that will help to transform the current system — in which the number of samples, testing equipment, and level of precision vary from region to region — into a unified system.

To ensure the safety of the food supply throughout Japan, the “all bag” rice inspection system introduced above must be extended beyond Fukushima. It must be extended, in particular, to those areas where contamination is relatively high and there is potential for the radioactivity standards to be exceeded. Extension of this testing system demands clarification of the role of the government and the development of laws and regulations to ensure that tests are systematic.

Conclusion : Collaborative Effort to Produce Contamination Maps

Is it possible to ensure the safety of agricultural products from nuclear disaster stricken areas and to thereby overcome the issue of reputational damage? While reputational damage is a difficult issue to overcome, we believe that a targeted program of contamination mapping holds the key to the effort. Two years after the Fukushima Daiichi nuclear accident, the central government has only managed to advance radioactive material policies that are retroactively issued after an issue develops and thus manages only to treat its symptoms. The perpetual reworking of these superficial measures does not advance us towards any fundamental solution. Effective policies start with analysis of the current situation and clarification of the extent and damages of contamination. The first priority is to produce ‘contamination maps’, detailed maps of the spatial distribution of radioactive contamination. These maps must be produced prefecture by prefecture for the entire country or they are meaningless. Only by knowing the degree of contamination is it possible to pursue effective countermeasures. Reputational damage is born from a situation where consumers’ insecurities are stoked by not having received appropriate information and subsequently opt not to purchase Fukushima products. A campaign based on mere slogans of easing consumer minds and calling on the public to support Fukushima is highly limited. Providing consumers with reliable safety information demands that scientific data is made publicly accessible. Policies for dealing with the radioactive contamination of farmland are founded on analysis of the soil, and it can thus be said that the creation of contamination maps covering a large area are not only of urgent import but also the crucial key to overcoming reputational damage.

The case of Fukushima Prefecture suggests that contamination mapping is the key to overcoming reputation problem but it also suggests some of the limits to such strategies at present. First and foremost, Fukushima evidences that contamination mapping is effective when built on cooperation. In Fukushima, the migration mechanism of cesium for each farm product was identified through the efforts of farm producers and volunteers. Through identifying the transition coefficient for each cultivar and soil and water analysis it will become possible to confidently plan for future agricultural cultivation. Staff

and cooperative members of Fukushima Co-op Union, through the support of the national Japanese Consumer Co-operative Union (JCCU), are participating in Agricultural Co-operative (JA) Shin Fukushima's contamination mapping project, forging an alliance between producers and consumers that aims to clarify the degree of contamination at a fine scale for all the farmland of the area. As of July 2013, a total of 100 individuals from the Co-op side of the alliance had participated. In Fukushima City, radioactivity measurements had been conducted for 36% of rice paddies and 69% of orchards and maps were being produced from the data. A system of farm management guidance based on this data is being advocated for. While this project has been successful, it also demonstrates the current limits of such efforts. Contamination map data is currently not publically accessible. In the future it is imperative for the central government to assume leadership of such efforts and to gather and publicly release this data.

It is also necessary for the central government to incorporate the innovative organizational efforts of JA Shin Fukushima and Fukushima Co-op Union to construct an inspection system that includes consumers and their mechanism of authentication into national level policies. Mere frustration with the current state of affairs will not advance towards resolution. It is imperative to further develop bottom-up institutional design and policy recommendations based on collaborative efforts between various cooperative groups, such as that currently developing in Fukushima. Only through a systematic effort to ensure and communicate the integrity and rigor of food inspections systems will the issue of reputational damage be put to rest.

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