

## **Dietary Practice of Hiroshima/Nagasaki Atomic Bomb Survivors**

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### *I. Introduction*

In August of 1945, the first atomic bomb was dropped in Hiroshima and the second in Nagasaki, leading to Japan's unconditional surrender and the end of the Pacific War between the U.S. and Japan. These bombs instantly killed at least 12,000 people and injured more than 100,000.<sup>i</sup>

Although most of the people within a two kilometer radius from the hypocenter died from direct or indirect exposure to atomic bomb blast and radiation, some did not suffer from diseases related to the radiation and are still alive at present. Then, the question we might ask is, "Why did these people survive while others did not?"



[Hiroshima Atomic Bombing: from <http://www.gensuikin.org/english/photo.html>]

The late Dr. Akizuki, a medical doctor in Nagasaki at the time of the bombing, survived and served to help the injured. He observed that these survivors had a common diet practice, which was a traditional Japanese diet enriched with Miso. Dr. Akizuki unfortunately passed away in 2005, but I was able to interview Mrs. Akizuki, as well as other atomic bomb survivors, a total of 30 people, in Hiroshima and Nagasaki, while I was in Japan in the summer of 2006. Utilizing the interview data, this study will examine atomic bomb survivors' dietary history for the purpose of qualitatively discussing the relationship between traditional Japanese food enriched with Miso and their health conditions after exposure to the atomic bomb. The atomic bombs were tragic events, but we can turn them into valuable lessons that can improve our health and eventually help us find ways to prevent and / or control cancer. My hope is that this study may shed light on the importance of diet to the human body's physical well-being, as well as applying it to today's medicine.

### *II. Previous Literatures*

#### *1. The nature of the problem to be examined*

For this project I interviewed, among others, Mrs. Akizuki, the wife of the late Dr. Akizuki, who sacrificially served as a medical doctor throughout Nagasaki atomic bombing and wrote various books on the aftermath from a medical viewpoint.



[Picture 1: Late Dr. Akizuki and his bio, <http://www.nashim.org/e/award/pr1.html>]

Dr. Akizuki was born in 1916 in Nagasaki and studied medicine at the Kyoto University medical school in order to understand and overcome his own illness and skin disease. Upon graduation, he returned to Nagasaki. He read the books written by George Osawa about the relationship between health and diet.<sup>1</sup> The books made him want to conduct experiments on the effectiveness of the traditional Japanese diet on the human body. He began to work as Director of the Department of Internal Medicine at Urakami Daihichi Hospital (later St. Francis Hospital) and instituted a strict diet of traditional Japanese food that was based on brown rice, miso and tamari soy soup, seaweed, and sea salt. He also prohibited the patients from consuming sugar and sweets. This diet was served to the patients and staff of the hospital twice everyday. It was during this time that the Nagasaki atomic bomb was dropped. The hospital was located approximately 1.4 km away from the hypocenter; therefore, most of the people in the hospital were exposed to the atomic bomb blast directly or indirectly. If they were inside the building, the radiation exposure was indirect, while those outside were most likely directly exposed to the blast and died immediately. Mrs. Akizuki stated that immediately after the bombing, she went outside of the hospital and saw a boy's dead body, whose brain had exploded. He must have been directly hit by the atomic bomb blast. The following pictures are some of the casualties caused by the atomic bomb blast, taken from "The impact of A-Bomb" in 1985.

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<sup>1</sup> He proposed that the human body and the soil that we live in are one, and thus we have to eat the food that is grown locally and naturally. His ideas have been spread in the name of "macrobiotics" all over the world today.



Iwakawa township, Nagasaki (700 m south-southeast of ground zero). The charred body of a volunteer student worker lies in the road where he was walking. 10 August 1945. (Photograph by Yōsuke Yamahata)



Plate 12. A fourteen-year-old girl with whole body burns. At the relief station in Omura Naval Hospital. Around 10 August 1945. (Photograph by Masao Shiotsuki)

Dr. Akizuki was 29 years old at the time of the bombing, and was one of few the bomb did not externally injure. He was inside the hospital building, taking care of a patient, when the atomic bomb was dropped. There was a flash of light, so he ducked under a nearby bed and survived. Since many people had been injured and since he had survived without injury, he struggled to help survivors with no medical equipment, while fighting against radiation sickness. Many people in Nagasaki and Hiroshima died from the fallout radiation released during the explosions into the air.<sup>ii</sup> Dr. Akizuki wrote about radiation sickness, saying that it “suddenly appeared in certain patients with no apparent injuries...All of us suffered from diarrhea and a discharge of

blood from the gums, but we kept this to ourselves. Each of us thought, tomorrow it might be me... We became stricken with fear of the future.”<sup>iii</sup>

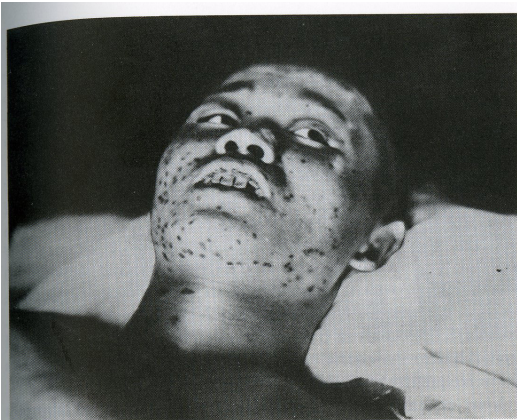


Plate 26. Subcutaneous hemorrhage appearing on patient's face. Loss of hair (18 August), gingival hemorrhage, purpura (29 August), fever (31 August), oropharyngitis and tendency to bleed (1 September). Patient died 3 September 1945, Hiroshima First Army Hospital's Ujina branch. (Photograph by Masao Tsuzuki and Gon'ichi Kimura)



Plate 27. Loss of hair seen in girls (*left and middle*) and a boy (*right*), Nagasaki. (Photograph by Kyushu Imperial University survey team)

Above pictures are from “The impact of A-Bomb” in 1985. These pictures illustrate the atomic bomb syndromes. Because virtually no medicine was available immediately after the bombing, Dr. Akizuki fed his patients the traditional Japanese food mentioned such as brown rice, miso and vegetables. Since the hospital was luckily used as a storage center for miso, soy sauce, and seaweed, as well as brown rice of that communal area, the hospital staff could supply their patients with traditional food. As a result, he was able to help many people survive from the direct injury, while other survivors perished or suffered from severe radiation sickness. He believed in the radiation-controlling effects of miso and claimed that the reason the people at his hospital survived radiation sickness was because of the miso soup that they ate every morning (Akizuki 1981 & 1975). When I interviewed the survivors at his hospital, they were unsure at first, but when I mentioned his claim regarding the hospital diet, most of them strongly agreed with his claim.

Fortunately, Dr. Akizuki survived even though he was only 1.4 km away from the epicenter of the explosion. However, many people within that same range suffered from serious

health problems such as cataracts, leukemia and other cancers, and premature aging. Within a few months of the nuclear explosions, the number of incidences of leukemia skyrocketed among the survivors, as did cancer rates soon after.<sup>iv</sup> Dr. Akizuki wrote his memoir book, “The Concentric of Death,” and mentioned in it the names of 31 people including patients and staff who had eaten the hospital food. Out of the 31 people in the book, 9 people are still alive. In the summer of 2006, I interviewed 7 of the survivors. The fact that about one third of the people who ate the hospital food are still alive after 60 years is in itself amazing, considering all of them excepting one had been exposed closely to the atomic bomb.

Dr. Akizuki’s claims regarding his beliefs about the traditional Japanese diet enriched with miso were published in his books (Akizuki 1981 & 1975). The following is a brief summary:

- 1) Medicine should create a healthy body condition that is immune to sickness. Without creating this condition, we can never cure sickness. One of the ways to create this healthy condition is to make the body alkalized, since a weak body is often created with the mass consumption of sweets and animal products, resulting in an acidic condition in the human body.
- 2) Diet determines our condition. The constitution of our body is hereditary, but our condition is constantly changing according to what we eat and the environment in which we live.
- 3) We live and grow in our surrounding environment, so we should eat food that is grown locally and eat them in season since our body and the land we live in are inseparable.
- 4) One cup of miso soup every morning will create a healthy condition that is immune to any sickness because miso is rich in enzymes, protein and unsaturated fat. We can intake 10 g of protein by drinking a cup of miso soup with tofu and seaweed. (Miso includes amino acid, peptide and so forth, which Tofu does not.)
- 5) Miso is a traditional Japanese food, used in various dishes such as miso soup, all of which have been developed through the long history of the Japanese diet, and thus are effective and beneficial to the bodies of people who live in Japan.

In regards to current research on the effects of miso, Dr. Watanabe, one of the collaborators on this project, at Hiroshima University has been conducting research studies on the effect of miso (Watanabe 2005). He feeds rats various kinds of miso (as well as NaCl as a control variable) and examines the rate of their prevention of cancer and radiation damage. He has found that miso can control cancer growth. In addition, miso fermented for 180 days has stronger effects on cancer prevention and radiation control than shorter period fermented miso. In other words, longer fermentation can create an environment where beneficial bacteria can prosper, thus synthesizing miso that is more effective for the prevention of cancer and the control of radiation. Besides Watanabe’s research studies, there have been various studies on the relationship between the intake of miso and disease control. The following is a summary chart regarding the scientific research on the effects of miso. The chart includes the year of the publication, the author’s names, positive effect (X) or no effect (O), the name of disease that miso has positive effect and the title of the articles.

[Chart 1: Articles summary on miso and disease control]

No.	Year	Authors	Effective	Disease	Title of the articles
1	1996	Ando et al	X	Colonic crypt foci	“Effect of a miso diet on colonic aberrant crypt foci



					in F344 rats exposed to azoxymethane”
2	1992	Asahara et al	X	Same chemical properties as milk	"Antimutagenicity and Mutagen-binding Activation of Mutagenic Pyrolyzates by Microorganisms Isolated from Japanese Miso."
3	1990	Baggot et al	O		"Effect of Miso (Japanese Soybean Paste) and NaCl on DMBA-Induced Rat Mammary Tumors."
4	1993	Basaran et al	X	Liver tumors	“Effects of soy products in reducing risk of spontaneous and neutron-induced liver tumors”
5	1991	Benjamin et al	X	Generally anti-cancerous	"Inhibition of Benzo(a)pyrene-induced Mouse Forestomach Neoplasia by Dietary Soy Sauce."
6	1998	Masaoka et al	O		Inhibitory Effects of Crude Salts on the Induction and Development of Colonic Aberrant Crypt Foci in F-344 Rats Given Azoxymethane.
7	2001	Ishimura et al	X	Prolonged life	“Radioprotective Effects of Miso (Fermented Soy Bean Paste) Against Radiation in B6C3F1 Mice: Increased Small Intestinal Crypt Survival, Crypt Lengths and Prolongation of Average Time to Death.”
8	1993	Ito et al	X	Liver tumors	“Effects of Soy Bean Products in Reducing Risk of Spontaneous and Neutron-Induced Liver Tumors in Mice”
9	2004	Adams et. Al	O		“Soy Isoflavones Do NO Modulate Prostate-Specific Antigen Concentrations in Older men in a Randomized Controlled Trial.”

10	1998	Masaoka et al	X	Colonic cancer	“Effects of Miso and NaCL on the Development of Colonic Aberrant Crypt Focu Induced by Azoymethane in F344 Rats.”
11	2000	Masaoka et al	X	Colonic crypt foci	“Inhibitory Effects of Crude Salts on the Induction and Development of Colonic Aberrant Crypt Foci in F-344 Rats Given Azoxymethane.”
12	1996	Masaoka et al	X	Colonic crypt foci	"Effect of a miso diet on colonic aberrant crypt foci in F344 rats exposed to azoxymethane."
13	2001	Ohara et al	O		Radioprotective Effects of Miso (Fermented Soy Bean Paste) Against Radiation in B6C3F1 Mice. Increased Small Intestinal Crypt Survival, Crypt Lengths and Prolongation of Average Time to Death.
14	2001	Ohara et al	X	Colon Tumors	Inhibition by Long Term Fermented Miso of Induction of Gastric Tumors by N-methyl-N'-nitro-N-nitrosoguanidine in CD (SD) Rats.
15	2001	Ohara et al	X	Small intestine cancer	Prevention by Long-Term Fermented Miso of Induction of Colonic Aberrant Crypt Foci by Azoxymethane in F344 Rats.
16	2005	Ohuchi et al	X	Colon Cancer	Decrease in Size of Azoxymethane Induced Colon Carcinoma in F344 Rats by 180-day Fermented Miso.
17	2003	Shiraki et al	X	Lung tumors	Inhibition by Long-term Fermented Miso of Induction of Pulmonary Adenocarcinoma by Diisopropanolnitrosamine

					in Wistar Rats.
18	1992	Watanabe et al	X	Arthritis	The Effects of Sodium Chloride, Miso and Ethanol on Rat ARteritis Induced by X-irraditaion.
19	1992	Watanabe et al	X	Colon Tumors	The Effects of Sodium Chloride, Miso or Ethanol on Development of Intestinal Metaplasia after X-Irradiation of Rat Glandular Stomach.
20	1997	Watanabe et al	X	Liver tumors	Effects of Miso in Reducing Risk of Liver and Gastric Tumors in Experimental Animals.
21	1999	Watanabe et al	X	Gastric Tumors	Influence of concomitant Miso or NaCl treatment on induction or gastric tumors by N-methyl-N'-nitro-N-nitrosoguanidine in rats.
22	2006	Hoshi et al	X	Breast Cancer	“Soyfood intake in the prevention of breast cancer risk in women: a meta-analysis of observational epidemiological studies.” J
23	2006	Lamartiniere et al	X	Breast Cancer	“Genistein and resveratrol: mammary cancer chemoprevention and mechanisms of action in the rat.”
24	2007	Inoue et al	X	Prostate Cancer	“[Effect of soy products on graft tumor growth in rats].”
25	2006	Anisimova et al	X	Tumors	“[Effect of soy products on graft tumor growth in rats].”
26	2006	Jung et al	X	Tumors	“Longer aging time increases the anticancer and antimetastatic properties of doenjang.”

Chart 1 shows that out of 26 research studies, 22 studies confirm the medicinal effect of miso on various diseases such as cancer and tumors. This result supports Dr. Akizuki’s claim that miso



helped the survivors live longer.

### III. Data

#### 1. Data

Thirty atomic bomb survivors were interviewed in the summer of 2006, and the interviews were video taped. The resulting data was analyzed with a focus on their dietary practice and medical history. The data sets were qualitatively and quantitatively analyzed. Among the 30 survivors, they were grouped into three distinct groups, based on the location and diet at the time of bombings:

(1) Nine of the interviewees who were exposed to the Hiroshima atomic bomb were interviewed in Hiroshima. They were friends of my sister's friend. Eight of them were healthy and conducting a normal life with their families. The other one was at a hospital in Hiroshima, which was where we conducted the interview with her.

(2) Twenty of the interviewees were interviewed in Nagasaki. All of them were in the Nagasaki area at the time of the bombing. I visited two nursing homes, in which atomic bomb survivors were residing and interviewed 14 people who were healthy enough to be interviewed.

(3) Seven of the 20 interviewees in Nagasaki, mentioned above, were at St. Francis hospital eating the traditional Japanese diet as directed by Dr. Akizuki.

In addition, one who was at the hospital now lives in Himeji, so the interview with her was conducted in Himeji, not Nagasaki. Therefore, 30 survivors were interviewed.

The questions that I asked were carefully prepared with Dr. Yu, another collaborator of this project, in order to efficiently collect the relevant data.<sup>v</sup> The questionnaire is appended.

#### 2. Data Analysis

I examined the survivors' interview data, focusing on their medical and physical struggles, as well as the effects of their diet on their health. The data are analyzed quantitatively first and then qualitatively, and the following section summarizes the data analysis results.

### IV. Analysis Results

#### 1. Quantitative Analysis

The results are summarized in Chart 2. This chart includes data from the survivors regarding their location (either Hiroshima or Nagasaki), name, sex, distance from the hypocenter, age at the time of the bombing, and direct and indirect health effects, as well as the use of miso.

[Chart 2: Summary of Interview Results]

		Name	S	where (km)	age in 1945	injury	syndrome	Miso
Dr. Akizuki Hospital Diet in Nagasaki								
	1	Kawano Shoichi	M	0.5	27	no	no	yes

	2	Hiyamizu Yoshimi (father)	M	3	18	no	yes	yes
	3	Takeyama Hiroshi	M	1.4	25	no	yes	yes
	4	Mizoguchi kikue	F	1.4	22	yes	yes	yes
	5	Kataoka ToshikoSister	F	1.4	13	yes	no	yes
	6	Akizuki Sugako	F	1.4	24	no	yes	yes
	7	Yoshioka Fukiko	F	1.4	34	yes	yes	yes
Hiroshima								
	1	Sasaki Tomiko	F	2.5	19	no	no	yes
	2	Shimamoto Yukie	F	1.5	15	no	yes	yes
	3	Wada Isao	M	away	20	no	no	yes
	4	Sakata Asaka	F	1.7	13	yes	yes	no
	5	Shinoda Megumi	F	2.8	13	yes	yes	yes
	6	Shinoda Saburo	M	3	22	no	yes	yes
	7	Ohta Junko	F	1.6	14	no	yes	yes
	8	Sakaguchi Hitomi	M	away	9	no	no	yes
	9	Numata Suzuko	F	1	21	yes	yes	yes
Nagasaki Nursing homes								
	1	Yoshikawa Yasuko	F	3.2	16	no	yes	yes
	2	Kumamoto Tsugiko	F	4	27	no	yes	yes
	3	Nishikawa Toshiko	F	3.6	19	yes	yes	yes
	4	Murakami Fuzi	F	5.5	19	no	no	yes
	5	Mukai Kimie	F	3.6	27	yes	?	yes
	6	Chiakaura Mitsuko	F	3.2	19	yes	yes	no
	7	Sakamoto Harue	F	12	27	no	no	yes
	8	Nishikawa Yokoichi	M	25	15	no	no	yes
	9	Kairada Toshiko	F	3	25	yes	?	yes
	10	Miyashita Shizuka	F	4	31	no	no	yes
	11	Kosasa Ayako	F	4	25	yes	no	yes
	12	Nakayama Yasuko	F	3	17	no	yes	yes
	13	Yamamura Tetsuko	F	2.6	20	no	no	no
	14	Matsumoto Suyo	F	2.8	31	yes	yes	yes
Total	300					12 yes	17 yes	27yes

Three points of interest arise from the chart.

First, three of the 30 survivors said that they did not recall eating Miso regularly, while 27 ate Miso soup up to three times a day almost everyday. Namely, 90% of survivors had been eating Miso at the time of the atomic bombing. According to Watanabe (2004), mice that had been eating miso 2 weeks prior to radiation exposure had a higher rate of survival. Miso might, therefore, have helped to ease the effects of the radiation from the atomic bomb. Second, all of the survivors, with the exception of one who was in the military and had access to more food than civilians, ate very small amounts of traditional Japanese food: grains and vegetables

seasoned with fermented food such as miso and shoyu. Many interviewees said that food was scarce during wartime and the simple diet was very helpful to cure their sicknesses. Their diet was simple, unprocessed organic food with little animal products or sweets/sugar. Third, those who ate Dr. Akizuki's instruction at the St. Francis hospital were a shorter distance from the epicenter and supposedly exposed to the most atomic bomb radiation but survived. According to Oughterson, et al (ed), people who were outside and within 0.5 km from the hypocenter cannot survive, and most of those who were within 1km and outside died. Chart 2 shows that most of the survivors except those who ate under Dr. Akizuki's diet were at least 2 km away from the hypocenter. There are a few exceptions, who escaped from the city to the countryside, so they did not inhale much radiated air after the bombing.

## 2. Qualitative Analysis

The stories narrated by the interviewees regarding their dietary practices were very similar. Since there was not much food during the war, they ate whatever they could. Most of the survivors interviewed were beyond a 1.4 km radius from the atomic bomb hypocenter. However, the people who ate Dr. Akizuki's diet at St. Francis hospital and survived were around 1.4 km or less from the epicenter. Many of the survivors who ate Dr. Akizuki's diet stated that the hospital food was helpful in recovering their health, and the diet might have increased the survival rate greatly. Some examples are as follows:

1) Takeyama Hiroshi: He was suffering from tuberculosis and was a patient at the hospital at the time of bombing. His diarrhea, which lasted for more than a month before the hospitalization, stopped after a few days of eating the hospital food. He believed that he did not suffer very badly from atomic bomb syndrome due to the hospital food.

2) Mizoguchi Kikue: She is a farmer and was walking home from a rice field when the atomic bomb struck. She was about 1.4 km from the hypocenter and exposed directly to the atomic bomb blast. The whole right side of her body was burned, which tortured her through her life. She had been eating homemade miso that her mother made at home all her life. After the bombing, she was carried to the hospital, where she ate the hospital diet. She believed that the hospital food, especially miso, helped her to survive and get better. Her sister, on the other hand, was not directly injured but died nevertheless because of atomic bomb syndrome,. Mrs. Mizoguchi used to eat a lot of vegetables and a small amount of animal products, fruits, and sugar at home around the time of bombing. She remembers that the year of the atomic bomb an unusually large amount of vegetables were harvested. She still gets red marks on her inner legs and under her arms in summer.



[Ms. Mizoguchi]



[Ms. Mizoguchi's right leg, which was severely burned by the atomic bomb, but mostly healed by now.]

3) Kataoka Toshiko: She was in the hospital building at the time of the Nagasaki atomic bombing and broke her shoulder. However, she she said did not suffer from atomic bomb syndrome because of the hospital food. She now lives in Himeji and works as a Catholic sister and remembers Dr. Akizuki saying, "Eat Yang food, don't eat sugar." Dr. Akizuki yelled at people who were eating sugar and sweets at the hospital.



[Sister Kataoka]

4) Yoshioka Fukiko, MD. She was 34 years old and worked as a medical doctor at the time of the bombing. She was terribly maimed all over her body and carried out of the building. She was bedridden for a while [how long?] after the bombing and ate the hospital food. Although she suffered from breast cancer later in her life, she lives today.



[Yoshioka, M.D.]

5) Kawano Shoichi, MD: The moment we met him, he said he has never smoked and has eaten brown rice throughout his life. He is a strong advocate of non-smoking and actively participates in an anti-smoker movement today.

Although he was at Nagasaki University medical school at the time of bombing, which was located about 0.5km from the hypocenter he was inside the hospital luckily and did not get injured. He went to the hospital immediately, and ate the hospital food. After the bombing, his blood became abnormal, so he went to Miyasaki, away from Hiroshima. Before the bombing, he used to go to the hospital once a week. After the bombing, he went and helped people as a medical student for one month at the hospital, during which he ate the hospital food. He believed that Dr. Akizuki's diet, which consisted of brown rice, miso soup, and salt, was helpful for preventing people from suffering from the atomic bomb syndrome.



[Kawano, M.D.]

6) Akizuki Sugako. She worked as a nurse at the time of bombing and supported Dr. Akizuki as his wife. She cooked the food at the hospital, serving miso soup everyday. Although she suffered from hair loss and rashes, she survived. She remembers that Dr. Akizuki insisted that people in the hospital eat miso soup every day and that no sugar was allowed. She observed that people, who had suffered severe burns and survived, lived longer than those who did not suffer from burns but suddenly died of atomic bomb syndrome. This might relate to the amount of intake of radiated food, water and air. Those who survived without injury had no choice but to breathe more radiated air so they could help others. She herself suffered from atomic bomb syndrome.

One week after the bombing, she had bloody gums and a fever. After 3 months, she lost her hair. Despite her condition, she had to work because there were so many casualties in the hospital.

When Dr. Akizuki suffered from azuma and was bedridden in 1992, she took care of him for 13 years until he died in 2005. She still goes to his gravesite and washes his tomb everyday, as if she was washing his body.

Regarding the hospital food, she remembers the following:

- a. The hospital at which Dr. Akizuki worked served miso soup every day.
- b. The hospital was used for the storage of miso/brown rice by the Nagasaki city government, so the hospital was able to serve miso soup and brown rice to the patients in the hospital.
- c. Dr. Akizuki learned about his diet from George Osawa. He went to Tokyo to meet Osawa and invited him to give them talks on traditional Japanese diet in Nagasaki. Dr. Akizuki tried to follow Osawa's diet starting three years prior to the bombing, by producing vegetables in the hospital garden, but the bombing made him too busy to practice the diet. He did not have time to chew brown rice, so instead he preferred polished rice mixed with many other grains such as barley.
- d. Dr. Akizuki encouraged others to eat more yang food, believing that yang food makes our bodies healthy. Some yang foods that the hospital served a lot were salt and root vegetables.

[Mrs. Akizuki wiping the tombstone of Dr. Akizuki]

7) Hiyamizu Yoshimi: He was a seminary student and was about 3 km away from the hypocenter, so he did not suffer injuries from direct exposure to the atomic bomb. However, he went to the hospital immediately after the bombing, suffering from diarrhea and rashes, which were the typical symptoms of atomic bomb syndrome. He remembers that Dr. Akizuki forbid the hospital people to eat sugar but one day, he and a Catholic priest who knew where sugar was stored in the hospital, sneaked in the storage and ate some. The next day, he had diarrhea and rashes. He realized that sugar was very bad for the body, especially to a radiation-exposed body,.

[From left, Mrs. Akizuki, the author, Father Hiyamizu, and the Collaborator, Dr. Watanabe]

The above 7 interviewees ate the hospital food as directed by Dr. Akizuki and cooked by Mrs. Akizuki. Although most of them were within 1.4 km from the hypocenter, they are still alive today.



In addition to those 7 people, I was able to interview 9 survivors in Hiroshima and 14 survivors in Nagasaki. The next section tells the stories of the 9 survivors that I was able to interview in Hiroshima.

1) Sasaki Tomiko: She was inside her house during the Hiroshima bombing, so she did not get any injury. She was about 3 km away from the hypocenter. She and her family went to Furiichi, where she saw many injured people. Some who were outside had swollen lips from being directly hit by the bomb blast (others would suffer hair loss or bloody gums in the hours that followed) Some people had more severe injuries, such as a broken skull or burns all over their bodies. Since there was nothing to eat, her family went to the countryside and bought sweet potatoes, which they cooked and sold on the black market. She and her family used to eat pumpkins, egg plants, and cucumbers. The main grain that they ate was rice. They did not eat much bread. There was not much to eat in the Hiroshima city, so she went to the countryside to get food. She did not eat food from animals or instant food at all. For something sweet, rice and beans with a little bit of sugar was eaten. She ate a lot of homemade miso soup along with other home-grown foods like umeboshi. The waterline still worked in Hiroshima so that people were able to drink fresh water. She remembered eating rice with umeboshi and konbu no tukudani a lot. She observed that people who lived through the war were very strong because of the simple diet that was available. She said it is better not to use sugar for health reasons. Countryside people were healthier than those who were in city because they were able to eat seasonable food. She was expecting a baby during the bombing (three months pregnant), but her daughter did not suffer any atomic bomb syndrome. She knows another woman who was pregnant at the time of bombing, and the baby was also born healthy. She did not suffer from atomic bomb syndrome because she went to the countryside immediately after the bombing; however, those who were in the city suffered from atomic bomb syndrome with symptoms such as hair loss and bloody stools. She knew a woman who suffered from burns on her back. She was at a cave and worms were in the burns from the bombing. Her mother took each worm out by a pair of tweezers. She remembers a lot of bodies lined near the river that were swollen three times larger than normal due to absorbing water and rotting organs. The bodies became the nests of flies and people who walked nearby were swarmed by flies. Although the sanitary situation was awful, she did not remember any contagious diseases.



[Ms. Sasaki]

2) Ohta Junko: She was 14 years old and 1.6 km away from the hypocenter. The building she was in collapsed on her and she had to extricate herself from the rubble. Broken pieces of glass struck her, and she suffered cuts in her right arm, face, and head. She lost her hair and did not have a period for a year. Upon leaving the city, she ate barley rice, eba dango (weed rice cake) and hard donuts since there was not much food. There was not much Miso or salt. She believes that although she could not eat much and had to work hard, it was good for her health.



[Ms. Ohta on the left with Mrs. and Mr. Shinoda on the right]

3) Mr. Shinoda: He was 1.8 km from the hypocenter and he was 22 years old. He was inside a building and, therefore, did not get injured. He escaped to the countryside after the bombing. After one month, his gums started bleeding. He survived by eating distributed food.

4) Mrs. Shinoda Megumi: She was 13 years old and 2.8 km from the hypocenter. Since she was sick on that day, she had stayed home from school. She still remembered that her first period after the atomic bomb was dark brown and thick. She remembers that that farmers put grated potatoes and cucumbers on the burnt skins of the casualties. Military people put oil on the burnt skins of the casualties. She talked about her brother, who was 2. Two months after the bombing, he started to have chronic diarrhea and died immediately. Most of the rest of her family survived the bomb but died of cancer (although some lived long). She wondered if it was because of the exposure to the radiation.

For her diet, she ate miso soup almost everyday, and barley rice, soy beans, and vegetables such as pumpkins. Miso was distributed by the government and vegetables were obtained from the countryside. Four years after the bombing, she began to have skin problems and developed red, hard marks all over her body, including her face.

5) Wada Isao: He was 19 years old during the atomic bombing. He was in the middle of military training on an island near Hiroshima at the time. He came to Hiroshima on August 6 around 3 pm to help the aftermath. When he got to Hiroshima, there were so many casualties lying on the beach, the ship was not able to get to the shore. The injured needed water, but people believed that water was not good. He was in the city for one week. Worms came out from the ears and noses of the bodies around three days after the bombing. After one week, many survivors started suffering from atomic bomb syndrome, such as experiencing hair loss and bloody gums. To stay healthy, Wada ate miso soup and rice everyday. Since he was in the military, he was able to eat enough food. (At that time, those who were in the military were thought to die soon for the nation, so they were provided with enough food.) He had diarrhea but

survived. The regular food that he ate was rice, miso soup, and a side dish. He was able to eat sweets such as fruits and red bean jelly in the military, although he was not able to smoke or drink alcohol. He ate many vegetables included cucumbers, but he ate very little meat and dairy. He observes that eating meat was not good for the health, while eating fish and vegetable was good. He observed that a lot of his fellow workers often died of cancer. He was not able to eat for two days after arriving in Hiroshima because of the odor of the bodies in Hiroshima city. In Hiroshima, no contagious disease spread because the waterline was intact.



[Mr. Wada]

6) Shimamoto Yukie: She was 15 when the Hiroshima atomic bomb hit. She was about 1.5 km away from the hypocenter. She was on her way to school, but was behind a fence so she did not get injured. She remembered that a colorful light jumped into her eyes, and for a minute or two, there was a silence. She went home, where she found her parents. She went outside and found many people, practically naked, walking as if they were ghosts. It was very hard for her to talk about her experience since she did not want to remember it; however, after 60 years, she felt that she had to talk about her experiences during the bombing so that the horrible story would be passed on and remembered through generations. She remembered that there were a lot of flies and odors from the dead bodies on the streets. She experienced diarrhea, fever, and hair loss even though she moved to the countryside the day after the bombing for half a month. School resumed in October, but she did not study at all because the circumstances were hard. For example, there were no textbooks. She believed that Japan should have surrendered earlier. Her husband was also a survivor and he was only one of the three in his class (45 students) who lived.

Regarding her diet, she moved to the countryside and was able to eat fresh fruits and vegetables, especially pumpkins and sweet potatoes, which helped her to stay healthy. She also ate a lot of pickles such as umeboshi. She believed that water was especially important. Her friends were currently dying from cancer at the time of the interview and she said that she believed that atomic bomb effects were still appearing 60 years after. The second generation suffered leukemia at a high rate in Hiroshima, and she believes that diet is the source of life.



[Ms. Shimamoto]

7) Sakata Asaka: She was 13 years old at the time of bombing. She was 1.7 km away from the hypocenter, and because of burns, she was in bed for half a year after the bombing. She believed that because she was eating a simple food diet, she was able to survive.



8) Numata Suzuko: She was 1km away from the hypocenter and she lost her right ankle in the bombing. Soon after, her leg they were forced to amputate for her survival. At that time, there were not enough medical supplies, such as anesthesia, so her father was holding her as a doctor cut off her right leg.

There was not much to eat, so the diet was simple and little, which was beneficial for her health. She knew a friend whose family ate a lot of rice because they got rice from the countryside, and the friend died young. She ate miso soup and umeboshi everyday, which came from the countryside. She also ate barley rice and pumpkins. She was afraid that the younger generation had become westernized in terms of diet, because she believed that the Japanese diet was the best for the Japanese people.



[Ms. Numata]

9) Sakaguchi Hitomi: He was only 9 years old during the Hiroshima atomic bomb. He was a student so he was evacuated to the countryside (40 km away from Hiroshima), and thus he did not suffer from any direct exposure to the atomic bomb radiation. He lost his parents and 4 siblings. He remembered that he ate the typical, traditional Japanese food, and that he ate miso soup every day.

[Mr. Sakaguchi in the middle between Mr. and Mrs. Shinoda]

In Hiroshima, I was able to interview Shinobu Kukuraku, a librarian at the Hiroshima Atomic Bomb Museum. She said that one week after the bombing, white rice balls were carried from countryside villages around Hiroshima into the city. During the war, people from varying villages made pacts with one another in case of emergencies like the bombings. However, after one week survivors had to find food by themselves, which was hard. Many people died from malnutrition. People who were able to go to the countryside or those who had relatives in the countryside were able to get food more easily. Therefore, their survival rate was higher compared with those who stayed in Hiroshima city after the bombing. The hygiene in Hiroshima city was awful because it was summer. Although the casualties' bodies were taken care of immediately, the bodies of animals, such as horses, were left in the city. Flies and maggots started to swarm. In September, however, there were two big Typhoons, which helped to clean the city, as well as clear up the radiation. The air became clear. However, the typhoons killed many survivors and decimated already limited food storage areas and houses. Fortunately, the running water in Hiroshima was not destroyed by the bombing, so they were able to drink the water. Even though, many people suffered from the effects of radiation

including diarrhea, which they thought was caused by contagious diseases such as dysentery (which was later proven false).

[From left: Ms. Kikuraku, Ms. Shinoda, the author, and Dr. Watanabe]

Finally, we were able to visit two nursing homes for atomic bomb survivors in Nagasaki. The first one was The Hill of Grace Nagasaki –Bomb Home, established by Catholic Sister Madarena. The home has welcomed many famous people such as Pope John Paul II, Mother Theresa and the emperor and empress of Japan. Before the Pope’s visit, the survivors did not want to remember or talk about their atomic bomb experience; however, he encouraged them to contribute to future peace by passing on their stories to the next generation. Since that visit of the pope, the survivors have started to talk about their experiences.

[Pictures of Pope, Mother Theresa and Emperor, visiting the nursing home]



February, 1981 Pope John Paul II





April, 1982 Mother Theresa



July, 1995 The Emperor and Empress (A Memorial Visit)

The following are the summaries of their atomic bomb experiences, focusing on their diet, especially the intake of miso.

- 1) Kairada Toshiko: She was a student and 3.0 km away from the hypocenter. She was inside a school building and had injuries on her face from broken window glass. She did not suffer from atomic bomb syndrome and ate miso soup every morning.
- 2) Miyashita Shizuka: She was 4.0 km away from the hypocenter. She was inside a building, and did not suffer from any direct injury or atomic bomb syndrome later. She ate miso soup regularly.
- 3) Kosasa Ayakko: She was 4.0 km from the hypocenter and she was inside of her home. She was injured by a falling statue and had bruises on her body. She did not suffer from the atomic bomb syndrome, and ate miso soup every day.
- 4) Nakamura Yasuko: She was inside of her house, which was 3.0 km from the hypocenter. She did not have any direct injuries. She suffered from atomic bomb syndrome such as diarrhea. She ate miso soup, which was made from distributed miso.
- 5) Yamamura Tetsuko: She was under a tree 2.6 km from the hypocenter. She did not eat miso soup. She did not suffer from any direct injuries or atomic bomb syndrome.



- 6) Matsumoto Suyo: She was 2.8 km from the hypocenter and was resting under a tree outside, so she suffered from burns on her legs. She put oil on her burns. She suffered from atomic bomb syndrome and lost her hair, but survived. She ate miso soup everyday.

I was also able to visit another nursing home, which was called Kametake in Nagasaki. I was able to interview another 8 survivors. The following is a summary of their stories focusing on their diets.

- 1) Yoshikawa Yasuko: She was 3.2 km away from the hypocenter inside of the gym in her school, so she did not have any direct injury. However she did suffer, from atomic bomb syndrome, such as bloody stools, diarrhea, and hair loss, and was bedridden for more than one month, living on miso soup.
- 2) Mukai Kimie: She was 3.6 km away from the hypocenter and she was outside near a temple, so she suffered from severe burns. It was unclear if she suffered from atomic bomb syndrome. She ate distributed miso.
- 3) Murakami Fuzi: She was 5.5 km away from the hypocenter and was inside her home at the time of bombing. She did not suffer from direct injury or atomic bomb syndrome. She ate miso soup every morning.
- 4) Sakamoto Harue: She was 12 km away from the hypocenter, so she did not suffer from any sickness or injuries. She ate homemade miso.
- 5) Kumamoto Tsugiko: She was 4 km away from the hypocenter and was inside her house. She suffered from atomic bomb syndrome, but not from direct injuries. She ate homemade miso.
- 6) Chikaura Mitsuko: She was 3.2 km from the hypocenter and she was inside a building, so she did not get any burns. However, she had bloody gums and hair loss, signs of atomic bomb syndrome. She did not remember if she ate miso.
- 7) Nishikawa Toshiko: She was 3.6 km from the hypocenter. Since she was inside a concrete building, she had bruises but not burns. She suffered from hair loss and bleedings, which did not stop. She ate homemade miso soup every day.
- 8) Nishikawa Yokoichi: He was 25 km away from the hypocenter, so he did not suffer from any sickness or injury. He ate miso soup every day.

#### *V. Conclusion*

Although the data was collected from a relatively small group, this study illustrates that most survivors ate miso and that it was very helpful for survivors' healing during the atomic bomb in Hiroshima and Nagasaki. In addition, the results show that Dr. Akizuki's food helped to ease atomic bomb syndrome for survivors. These results can contribute to today's society in many

ways. First, the results can inform the public of the beneficial dietary effects of traditional Japanese food that is enriched with miso. This will lead to the recognition and reevaluation of Japanese culture and its traditional diet. Second, these findings can contribute to the future marketing of miso in the miso industry. It will also lead to changes to a diet enriched with miso, which is not only a condiment for food but also a probiotic in dry form with little salt. This information will be useful for those who are undergoing radiation therapy and may eventually contribute to the medical field of cancer treatment.

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<sup>i</sup> TABLE A: Estimates of Casualties

	<b>Hiroshima</b>	<b>Nagasaki</b>
Pre-raid population	255,000	195,000
Dead	66,000	39,000
Injured	69,000	25,000
<b>Total Casualties</b>	<b>135,000</b>	<b>64,000</b>

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[http://www.atomicarchive.com/Docs/MED/med\\_chp10.shtml](http://www.atomicarchive.com/Docs/MED/med_chp10.shtml)

ii

Radiation is an unstable nuclei of decaying atoms, releasing particles which damage organic materials. Radiation is measured with the unit of rem, 'Roentgen Equivalent in Man,' which represents the amount of radiation needed to damage living tissue. Why then is exposure to radiation so harmful to the human body? It destroys organic materials and causes many radiation sickness symptoms including nausea, vomiting, headache and some loss of white cells, as well as chronic diseases such as burns, cancers and leukemia. A dose of 25 rems causes some detectable changes in blood, a dose of 100 rems causes radiation sickness, and a dose of 800 rems definitely leads to death. Those in Nagasaki and Hiroshima at the time of bombings received up to 6000 rems.

iii

<http://www2.nbc-nagasaki.co.jp/peace/voices/en-no11.html>

iv

<http://www2.nbc-nagasaki.co.jp/peace/voices/en-no11.html>

v

IRB approval is applied for and has since been obtained at Illinois Wesleyan University since this project involves interviews, which will be video-recorded.

## Appendix I

### 1. Curriculum Vitae of Dr. Akizuki

January 3, 1916	Born in Manzai-machi, Nagasaki City
March 1940	Graduated from Kyoto University Medical School
June 1940 to April 1941	Assistant to Dr. Takashi Nagai in the Department of Physical Rehabilitation, Nagasaki Medical College
June 1941 to July 1944	Physician at Takahara Medical Clinic
August 1944 to March 1948	Medical director at No.1 Urakami Hospital (now St. Francis Hospital)
June 1949	Private practice in Yue, Kitatakaki-gun, Nagasaki Prefecture
December 1951	Physician at Yue Town Clinic
April 1952	Medical Director at St. Francis Hospital
January 1985	Consultant, St. Francis Hospital
Awards	
November 1968	Japan Medical Association Excellent Service Award
April 1972	Sixth Yoshikawa Eiji Award for Contributions to Culture and Society
November 1972	Nagasaki Prefecture Citizen's Award
April 1976	Nagasaki City Award for Meritorious Service
February 1980	St. Silvester Award from the Vatican

## 2. Major Activities

In his book Nagasaki Genbakki (A Record of the Nagasaki Atomic Bombing) published in 1966, Dr. Akizuki shocked Japan with descriptions of his activities after the atomic bomb survivors. Dr. Akizuki was actively involved in efforts for relief legislation and in movements working towards the abolition of nuclear weapons. His many positions in this regard include chairman of the Nagasaki Testimony Association, chairman of the board of directors of the Nagasaki Foundation for the Promotion of Peace, and consultant to the Nagasaki chapter of IPPNW (International Physicians for the Prevention of Nuclear War).

## Appendix II

I. Questionnaire: The questionnaire that I used include the following questions.

1. Name
2. Address
3. Phone number
4. Fax number
5. E-mail address
6. Age
7. Gender
8. Occupation (if retired, former occupation)
8. Age at the time of bombing
9. Injury/sickness directly caused by bombing
10. Process of curing the injury/sickness
11. Present health condition
12. Dietary practice typical daily food- circle the frequency of the following intake,  
Daily    weekly    monthly    rarely    never
  - a. whole grain
  - b. refined grain
  - c. beans/bean products (tofu)
  - d. vegetables
  - e. meat
  - f. milk/dairy products
  - g. eggs
  - h. oil/fat
  - i. sugar
  - j. fruits
  - k. sweets
  - l. instant food
  - m. fast food
  - n. sea vegetable
  - o. pickles
  - p. miso/miso soup
  - q. shoyu
  - r. umegoshi

- 
- s. smoking
  - t. alcohol
  - u. any medication
  - v. spices
  - w. sea salt
  - x. table salt
  - y. snacks
  - z. Chemicals (MSG)

## II. Interview-narrative

- 1) Please explain your atomic bomb surviving experience.
  - a. Where were you?
  - b. What were you doing?
  - c. What did you do immediately after the bombing?
- 2) Please explain your dietary practice in details.
  - a. What did you eat when you grew up?
  - b. What did you eat after the bombing?
  - c. What do you eat these days?
- 3) Do you notice any dietary influences on your health? If so, please explain?
- 4) How do you think about the diet you took after the atomic bomb?
- 5) What kind of water did you drink before and after the atomic bomb?
- 6) What made you nauseous after the bombing? Is there any specific food that made you sick or sicker?

In addition to these questions, I plant to ask Mrs. Akizuki the following questions.

- 1) Please describe your experience as a nurse, serving the survivors, working with Dr. Akizuki.
- 2) What kind of food was served in your hospital, immediately after the atomic bomb?
- 3) How were they prepared? Were you in charge? If not, who and how were they trained?
- 4) Any changes that you had noticed or recorded regarding the patients' condition changes because of the diet?
- 5) Describe your husband's work and his experience as a doctor serving for the survivors as much as you remember.