

Recent Conditions of Food Safety in Japan - Food Additives and Pesticides -

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I studied on the recent conditions of food safety concerning food additives and pesticides in Japan.

Many problems are shown in this fields as the following.

One of the most serious problems is the decision of new level for using food additives and pesticides without enough examination during the 1980's, which have been following to attend WTO (World Trade Organization) and to amend The Food Safety Law in Japan.

Another problems are people being far from the information and having few participation to the decision making about food safety. Consumers, the government and industries should make the new system or network to discuss on food safety. Science and scientists should indicate some results to the better decision making.

Introduction

In these 25 years, especially in these 10 years, many problems have been occurred regarding dietary life, food and agriculture in Japan.

For example, food self-sufficiency rate of Japan have been decreasing year by year (Table 1.)¹⁾. In 1995, it was 42% at last²⁾. Today, we are depending on food from other countries over half of our stomachs.

While in the other industrialized countries their self-sufficiency of grain have been increasing, it has been decreasing continuously in Japan. Japan is the worst country of its food self-sufficiency (Table 2.)³⁾.

Further, in 1995 the Food Safety Law was amended after 23 years. It was a great reform on food safety, because the criteria for regulation of food additives and pesticides were changed and the 1051 natural food additives were designated without the examination on safety.

The events as mentioned above, were happened on the way to internationalization of dietary

Key words : food safety, the Food Safety Law, food additives, pesticides, WTO (World Trade Organization), Japan

Table 1. Food Self-sufficiency Rate of Japan (Unit :%)

Agricultural product	1960	1965	1970	1975	1980	1985	1990	1993	1995
Rice	102	95	106	110	87	107	100	75	103
Wheat	39	28	9	4	10	14	15	10	7
Beans	44	25	12	9	7	8	8	4	5
Vegetables	100	100	99	99	97	95	91	83	85
Fruits	100	90	84	84	81	77	63	53	49
Hen' s eggs	101	100	97	97	88	98	98	96	96
Milk, dairy products	89	86	89	81	86	85	78	81	72
Meat	93	90	88	77	81	81	70	64	57
Sugar	18	31	15	15	28	33	33	33	35
Fish, shellfish	110	109	108	106	104	96	86	76	74
Calorie supply	79	73	54	54	52	52	47	37	42
Staple-food cereal	89	80	69	69	69	69	67	50	64
(references)									
Grain (for food and feed)	82	62	40	40	31	31	30	22	30
Grain for feed	—	55	34	34	27	27	27	24	25

Source : Ministry of Agriculture, Forestry and Fisheries

Notes : 1) Self-sufficiency rate = Domestic production ÷ Domestic consumption × 100 (weight base)

Calorie supply self-sufficiency rate = Calorie supply by domestic production ÷ Whole domestic calorie supply × 100

2) 1993 was the irregular year by the unprecedented damage from cold weather.

3) The rate of foodstuffs self-sufficiency was calculated by a rough estimation that grain for foodstuffs and grasses were converted as Total Nourishment (TDN)

4) Fish and shellfishes were included the foodstuffs and fertilizers.

Table 2. Cereal Self-sufficiency Rate of Developed Countries (unit :%)

Countries	1961	1965	1970	1975	1980	1985	1990	1992
France	116	136	139	150	177	191	210	228
US	115	122	114	160	157	172	142	151
Germany	62	66	72	80	85	94	114	112
Japan	76	63	49	43	28	33	29	29

Sources: Ministry of Agriculture, Forestry and Fisheries, FAO

life, food and agriculture.

The food safety and stable food supply are the most important things for people's life, but they have been threatened.

In this article, I will try to investigate these problems using by historical method. And after that I would like to clarify some problems in Japan today.

Results - Food Safety in Japan

In Japan the regulation for food safety started about 100 years ago in Meiji Era. But the modern regulation system for food safety were made after the World War II, so I would like to follow the topics concerning the food safety after 1945 in Table 6. (I decided the periods by food

safety and social events for convenience' sake.)

(1) 1945-1969

In this first decade from 1945 to 1954, people had to make a desperate efforts to get something to eat everyday.

Around 1955 the numerous economical growth was started and people began to move into cities from rural areas to get new jobs. On the other hand the dietary lives of people reached at the level of it before the World War II. This first decade was the only period of agricultural production increase after the World War II in Japan.

In 1960 the agricultural change occurred already, which was the start of liberalization of agricultural products. Then, generally the agricultural production have been decreasing year by year (Table 1.).

The dietary habits began to change to the western style. Instant food, e.g. Chinese noodle (1958) and instant coffee (1960) was started to sell. Coca-Cola began to sell in 1961. These were typical and epoch-making events, and the change began from these events. Besides "KAPPA EBISEN (junk snack food)" (1964) and "Bon curry" (the first retort food in Japan, 1968) were started to sell.

The Food Safety Law was enforced at January 1st in 1948. In this law, food additives were only synthetic chemicals. At the first year 60 food additives were designated. It did not have enough protective effects for consumers but it started at any rate (Table 3.).

The Food Safety Law amended in 1957 to define the definition of food additives and the criteria. In this law food additives were defined as "food additives are the things which use for food production, processing and preservation through addition, mixing, saturation and other methods (Article 2, Clause 2)." Further, they were defined as "food additives are the things which were gotten through chemical reaction of chemical elements or compounds except resolution (Article 2, Clause 3)."

The number of food additives increased to 189. After that the number had been growing continuously during these period and it reached to 356 in 1969 (Table 3.).

But in the last some years of this period many troubles from food were happened or clarified. They were Minamata Disease by Methyl Mercury Poisoning (1953), Morinaga Milk Pollution by arsenic (1955) and Kanemi Rice Oil Pollution by PCBs (Polychlorinated biphenyls, 1968) .

The doubts for safety of food additives were occurred especially after the Rachel Carson's "Silent Spring (1962) ". Then the carcinogenic effects of some food additives, e.g. tar artificial coloring agents, Dulcin (p-ethoxyphenyl-urea, deleted in 1968) or Chicro (sodium cyclamate and calcium cyclamate, deleted in 1969), were identified. These troubles showed that food industries grew bigger, victims grew bigger than before if the accident was happened. But the

Table 3. The Number of Food Additives in Each Year (Synthetic Chemicals) and Their Details Which Are "Deleted afterward", "Doubtful" and "Not Doubtful or Unknown" .

Year	Designated	Deleted	Sum	(%)	Deleted afterward	(%)	Doubtful	(%)	Not Doubtful, Unknown	(%)
1948	60		60	100%	22	37%	19	32%	19	32%
1950	10		70	100%	30	43%	21	30%	19	27%
1952	4	-1	73	100%	32	44%	21	29%	20	27%
1953	8		81	100%	35	43%	24	30%	22	27%
1954	4		85	100%	37	44%	26	31%	22	26%
1955	11		96	100%	41	43%	27	28%	28	29%
1956	10		106	100%	44	42%	29	27%	33	31%
1957	90	-1	195	100%	43	22%	54	28%	98	50%
1958	14		209	100%	43	21%	54	26%	112	54%
1959	25	-10	224	100%	33	15%	60	27%	131	58%
1960	23		247	100%	42	17%	65	26%	140	57%
1961	10		257	100%	42	16%	70	27%	145	56%
1962	34		291	100%	42	14%	74	25%	175	60%
1963	20		311	100%	45	14%	80	26%	186	60%
1964	38	-3	346	100%	46	13%	81	23%	219	63%
1965	1	-4	343	100%	43	13%	83	24%	217	63%
1966	14	-7	350	100%	37	11%	83	24%	230	66%
1967		-1	349	100%	36	10%	83	24%	230	66%
1968	5	-1	353	100%	35	10%	83	24%	235	67%
1969	5	-2	356	100%	35	10%	84	24%	237	67%
1970		-5	351	100%	30	9%	84	24%	237	68%
1971	2	-13	340	100%	17	5%	85	25%	238	70%
1972		-3	337	100%	14	4%	85	25%	238	71%
1974		-1	336	100%	13	4%	85	25%	238	71%
1975		-3	333	100%	10	3%	85	26%	238	71%
1977	1		334	100%	10	3%	86	26%	238	71%
1978	2	-2	334	100%	8	2%	87	26%	239	72%
1982	2		336	100%	8	2%	87	26%	241	72%
1983	11		347	100%	8	2%	92	27%	247	71%
1991	7	-5	349	100%	3	1%	96	28%	250	72%
1992	1		350	100%	3	1%	97	28%	250	71%
1993		-2	348	100%	1	0%	98	28%	249	72%
1995	1	-1	348	100%	0	0%	98	28%	250	72%
1997	1		349	100%	0	0%	98	28%	251	72%

Source : "Food Additives" (Y. Watanabe, 1996) , "Food Safety Law, WTO Agreement, Codex Alimentarius, Q and A" (K. Fujiwara, 1995) , "Information on Food" (1995/8) , "Discussion on Food Additives" (Iwanami, 1984) .

government and industries did not correspond sincerely.

Thus the consumer movement against the using of potentially dangerous food additives and other chemicals was widely spread in Japan.

(2) 1970-1979

In this early year 1973 the oil shock was happened. The marvelous economic growth of Japan was stopped at last and it was so called "low growth".

In this period many new first food chains and restaurant chains were opened and had been wide spread to all over Japan in an instant. The food service industries in Japan developed rapidly.

These were "Sky lark (the family restaurant, 1971)", "Kentucky Fried Chicken (1971)", "Mr. Donuts (1971)", "MacDonard (hamburger chain, 1971)", "KOZO SUSHI (SUSHI chain, 1972)", "Lotteria (cafeteria chain, 1972)", "The Pizza Hut (1973)", "Sherkeys (1973)" and "HOKKA HOKA TEI (OBENTO Japanese lunch box chain) (1976)". Also in 1974, "Seven-Eleven (the convenient store)" was opened.

But as the reaction of these, the consideration of dietary habits seemed to start partially, so the natural food and healthy food were boomed (1978). The dietary fibers was looked again (1979).

On the other hand, the consumer paid attention to the food safety and the movement was continued. In 1970 the pollution of mothers' milk by BHC (benzene hexachloride, pesticide) was clarified and BHC was deleted from pesticides in 1971. In synthetic chemical sweet "Chicro (sodium cyclamate and calcium cyclamate)", the carcinogenic effects were pointed out again (1970).

Further in the pesticide DDT (dichloro-diphenyl-trichloroethane) ,the carcinogenic effects were identified and DDT was stopped to use in 1971.

As corresponding the consumer movement from the 1960' s, in 1972 the Food Safety Law amended and the regulation of food additives was discussed in the National Diet. It was called "KOUGAI KOKKAI (the Diet against environmental pollution)." The National Diet resolved the limitation of using food additives. It said that the using of food additives have to be limited as possible and if its harmfulness was identified in other countries the necessary measure have to be done to prohibit to use it regardless of it was designated or not.

Therefore 25 food additives which were doubted their carcinogenic effects, e.g. Tar Artificial Coloring Agents, AF-2 (2-[2-furyl]-3-[5-nitro-2-furyl]acrylic acid amide, antimicrobial agent), were deleted. The new designation of food additives had been checked for some years in this period. In 1975 the number of food additives was decreased to 333. We can know the facts that many dangerous food additives have been used until deletion at the first 30 years (Table 4.).

However, during these last five years in this period, the situation was changed. USA tried to export lemons and oranges to Japan but it was ended in failure, because they were treated with the pesticides, e.g. TBZ (Thiabendazole), OPP (o-Phenylphenol and Sodium o-Phenylphenate) and DB (Diphenyl), which were not permitted in Japanese. It was afraid that TBZ and OPP are

the pesticides and have the carcinogenic effects or toxicity. In spite of these danger, the USA government had pressured the Japanese government in order to break the situation by using of the Japanese-USA trade agreement for a few years. OPP (1977) and TBZ (1978) were designated as food additives, because the Japanese government did not have the way to designate them as pesticides, when in Japan pesticides were allowed to use before harvest and not allowed to use post harvest. Thus the different interpretation of law from before had done and started from this.

After this in Japan the number of food additives had been increasing again and still now (Table 3.). The pressure to liberalization of trade from the USA grew stronger and stronger and the food safety in Japan begun to be threatened.

(3) 1980-1989

Many new food products were begun to sell, e.g. "Pocari Sweat (a sports drink, 1980)", chilled food(1981), "OISHII MIZU boom(good tasted water, one of the mineral water, 1983)", "Fibe Mini (drink containing dietary fiber, 1988)". These were called as diversity of diet.

On the other hand, in this period the import of food and agricultural products had been increasing numerously. It was named as internationalization of diet. In 1985, the number of imported food was 384,728 and it grew up to 682,182 in 1989. The increased ratio was 1.77 times (Table 4.). But the agriculture in Japan had been throwing into crises. And the food self-sufficiency of Japan had been decreasing continuously and the calorie supply self-sufficiency rate was 47% in 1990 (Table 1.).

According to the increase of imported food and agricultural products, the new unused food additives or pesticides were designated as food additives for smoothing import from other countries. In 1983, 11 items were designated against the movement by consumers. The government showed the plan to an easing of food safety criteria in 1987. The number of food

Table 4. The Import of Agricultural Products

year	the number of notified	the rate compared with 1975 (%)	imported weight (unit:t)	the rate compared with 1975 (%)
1955	23,180	9.4	7,604	36.6
1965	94,986	38.5	12,765	61.4
1975	246,507	100.0	20,775	100.0
1980	314,177	127.5	23,108	111.2
1985	384,728	156.1	22,665	109.1
1986	477,016	193.5	22,284	107.3
1988	655,806	266.0	21,924	105.5
1990	678,965	275.4	21,731	104.6
1994	963,359	390.8	30,595	147.3

Source : "The statistics of imported food observation"

additives increased again to 347 in 1989 (Table 3.).

Further, in spite of the carcinogenic effects or toxicity of food additives were identified, Aspartame (chemical sweets), Adipic Acid, Calcium Disodium Ethylenedia-minetraacetate (Calcium Disodium EDTA), Disodium Ethylenediaminetetraacetate (Disodium EDTA), Propionic Acid, and other new food additives were designated. The carcinogenic effects of Hydrogen Peroxide (1980) and Potassium Bromate (1982) were cleared up but these had been allowed to continue to use still now (Table 5). And many imported food, e.g. flour, were polluted by the not-designated pesticides and their safety could not be known.

Those facts showed that the government, industries and consumers have been separated and consumers were made far from the full and necessary information. The government had tended not to hear the voice of consumers but of the industries, USA and other countries.

(4) 1990-1997

In this period, the internationalization and diversity of diet were progressed further.

"Tiramis (Italian cheese cake, 1990)" and another imported food were boomed. The number of imported food were increased, and especially vegetables and fruits were enormously increased to 390.8% (1994) as compared with 1975 (Table 4.) The liberalization of beef and oranges was done in 1991. Many stockbreeding farmer were very damaged, and one of them was killed himself⁴⁾.

In 1992 the criteria of 34 pesticides residues were decided newly, though 26 pesticides had had their criteria of residues before. Further in 1994, 22 pesticides were set up their criteria. At last in 1997, 138 pesticides had their criteria of residues.

And the pesticide Imazaril is doubted its toxicity, and yet it was designated as a food additive in 1992.

1993 was the irregular year by the unprecedented damage from cold weather (Table 1). So the emergent import of rice was done, but some troubles were caused, e.g. blended rice, post-harvest pesticides, contamination of rice by uneatable things. These showed one of the evidences that the import of rice must be dangerous.

Further in 1993, 9 food additives were made them use wider than before. Thus most of food additives designated recently were doubted their carcinogenic effects or toxicity (Table 3.). I would like to show the food additives which were doubted their carcinogenic effects or toxicity in Table 5.

In 1994, General Agreement on Tariffs and Trade (GATT) prepared to the new system World Trade Organization (WTO) for more free trade. It has aimed to make new smoother global free trade system of all commodities, e.g. products, services and others, without customs barriers. Further it has strongly purposed to put all attended countries under the control and observation

to carry out the new rules through the trouble-shooting. It started on January 1st in 1995.

Keeping pace with WTO started and the harmonization to the international standard, the Food Safety Law was amended in 1995 after 23 years. Now the regulation and check for food safety began to loosen. Natural food additives were recorded in the list of food additives except synthetic chemicals, and they could use freely under the reporting system. The levels of pesticides residues were set up newly or were increased higher than before, as CIPC (chlorpropham) for potato increased from 0.05 ppm to 50 ppm, 1,000 times. These criteria were not decided with original examination of food safety, but were used the criteria of Codex Alimentarius. Thus the amended Food Safety Law is threatened our dietary life, not keeping the safety.

Discussion - Problems of Food Safety

As mentioned above, after 1970, especially in these 10 years, the criteria of food additives and pesticides of food safety have been decreasing continuously for the reason of trade internationalization or harmonization. Natural food additives were designated without the examination and the number of food additives took long strides.

Besides, the information of these were not shown widely enough, so the focus of these facts were not made clearer for consumers. Thus the consumer movement for demanding the food safety have not gotten their force, while the new system for increase the food import and for decrease the food self-sufficiency have been establishing more and more.

But for living in safe and healthy, the food safety has to be kept for not only adult consumers but also offspring in the future.

In 1962, Rachel Carson warned the effects of synthetic chemicals in the book "Silent Spring".

She described ;

"The new environmental health problems are multiple - created by radiation in all its forms, born of the never - ending stream of chemicals of which pesticides are a part, chemicals now pervading the world in which we live, acting upon us directly and indirectly, separately and collectively. Their presence casts a shadow that is no less ominous because it is formless and obscure, no less frightening because it is simply impossible to predict the effects of lifetime exposure to chemical and physical agents that are not part of the biological experience of man."⁵⁾

Also she pointed out ;

"For mankind as a whole, a possession infinitely more valuable than individual life is our genetic heritage, our link with past and future. Shaped through long eons of evolution, our genes

not only make us what we are, but hold in their minute beings the future - be it one of promise or threat. Yet genetic deterioration through man-made agents is the menace of our time, the last and greatest danger to our civilization."⁶⁾

Today, the book "Our Stolen Future" written by Theo Colborn, Dianne Dumanoski and John Peterson Myers, was published in U.S., 1996.

New York Times said that it identified the various ways in which chemical pollutants in the environment were disrupting human reproductive patterns and causing such problems as birth defects, sexual abnormalities, and reproductive failure, and it was warning the effects of synthetic chemicals to human-bodies, creatures and environment again⁷⁾.

In this book, they pointed out ;

"Human also carry PCBs and other persistent chemicals in their body fat, and they pass this chemical legacy on to their babies. Virtually anyone....will find at least 250 chemical contaminants in his or her body fat....You cannot escape them.....These synthetic chemicals move everywhere, even through the placental barrier and into the womb, exposing the unborn during the most vulnerable stages of development. When a new mother breast-feeds her baby, she is giving it more than love and nourishment: she is passing on high doses of persistent chemicals as well."⁸⁾

Further they said ;

"We must be ever mindful that for all the advances in science, we still have only the most general understanding of the life systems on which we have been experimenting - whether our own bodies or Earth's atmosphere."⁹⁾

So, they showed some proposes ;

"As we look toward the future and think about charting a new course, it is critical to begin with a clear-eyed view of our situation. As the experience over the past half century has demonstrated, there is no way to put large quantities of man-made chemicals into the environment without exposing our children and ourselves to unknown risks. Many of these synthetic compounds may prove harmless, but others may not. We must face the fact that there is no way to guarantee the safety of synthetic chemicals, even those that have been on the market for decades."¹⁰⁾ "To screen for chemicals that can rob human potential before birth, it will be necessary to look for developmental effects across three generations - those individuals exposed only as adults and their children and grandchildren who inherit hand-me-down poisons."¹¹⁾ "Consider the interactions among compounds, not just the effects of each chemical individually. Government regulations and toxicity testing methods currently assess each chemical by itself. In the real world, we encounter complex mixtures of chemicals. There is never just one alone. Scientific studies make it clear that chemicals can interact or can act together to produce an effect that none could produce individually. Current laws ignore these additive or interactive effects."¹²⁾

Over 50 years have passed after the first using of the synthetic chemicals. Thirty five years have passed after the warning of "Silent Spring". Then, the carcinogenic effects for human-bodies and other creatures had been considered mainly. Now, the new effects of synthetic chemicals have been clarified, as disruption of human and creatures reproductive patterns. And concerning it, the hormonal, neurological and immunological effects have to be considered. It is clear that no one have not known the results of using synthetic chemicals as food additives and pesticides for a long time, still now. However, synthetic chemicals have been using more than before, and many new chemicals have been making year by year.

The situation today have to be rethought, e.g. harmonization, internationalization and loosing the criteria. The government and industries have been corresponding to the events one by one, e.g. Minamata Disease, Morinaga Milk Pollution by Arsenic, Kanemi Rice Oil Pollution by PCB, Tar Artificial Coloring Agents Problems, AF-2, Dioxins, Genetic Engineering Food. The new system for food safety have to make through the discussion of consumers, the government and industries. For this purpose, we need to clear the many hurdles, e.g. full information for food safety from government and industries, participation to the decision making, network of consumers in the country and with other countries. Consumers need more and adequate information to division making. The role of science and scientists is more important than before to offer the exact data.

Many problems have been remained, e.g. whole effects or toxicity of food additives and other chemicals, the role of scientists, the future of agriculture, the examination method, the estimation method for the safe level of food additives or pesticides and the decision making system. I would like to continue to make clearer the problems for the food safety and the health of people.

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Table 5. The List of Synthetic Food Additives Which Are Doubted Their Carcinogenic Effects or Toxicity

Designated No.	Name	Designated year	Designated No.	Name	Designated year
1	Sodium Chlorite	1963	167and168	Food Red No.40	1991
2	Adipic Acid	1983	169	Food Red No.102	1948
3	Sodium Nitrite	1957	170	Food Red No.104	1948
9	Aspartame	1983	171	Food Red No.105	1948
19a	Sodium Sulfite (Crystal)	1948	172	Food Red No.106	1957
19b	Sodium Sulfite (Anhydrous)	1948	173and174	Food Yellow No.4	1948
21	Sodium Alginate	1957	175and176	Food Yellow No.5	1948
23	Benzoic Acid	1948	177and178	Food Green No.3	1948
24	Sodium Benzoate	1948	179and180	Food Blue No.1	1948
33	Allyl Isothiocyanate (Volatile Oil of Mustard)	1959	181and182	Food Blue No.2	1948
36	Imazali	1992	197	Sorbic Acid	1955
43	Calcium Disodium Ethylenediaminetetraacetate (Calcium Disodium EDTA)	1983	198	Potassium Sorbate	1960
44	Disodium Ethylenediaminetetraacetate (Disodium EDTA)	1983	201	Potassium Carbonate (Anhydrous)	1957
46	Erythorbic Acid (Isoascorbic Acid)	1961	204	Sodium Hydrogen Carbonate (Sodium Bicarbonate or Bicarbonate of Soda)	1948
47	Sodium Erythorbate (Sodium Isoascorbate)	1961	205a	Sodium Carbonate (Crystal) (Carbonate of Soda (Crystal))	1966
49	Ammonium Chloride	1950	205b	Sodium Carbonate (Anhydrous) (Soda Ash (Anhydrous))	1957
55	Eugenol	1962	207	Thiabenzazole	1978
58 and 59	o-Phenylphenol and Sodium o-Phenylphenate	1977	235	Nicotinic Acid (Niacin)	1957
61	Hydrogen Peroxide	1948	236	Nicotinamide (Niacinamide)	1957
62	Benzoil Peroxide	1953	243	Lactic Acid	1957
64	Sodium Caseinate	1961	252	Isobutyl p-Hydroxybenzoate	1963
66	Ammonium Persulfate	1956	253	Isopropyl p-Hydroxybenzoate	1963
76	Disodium 5'-Guanylate (Sodium 5'-Guanylate)	1961	272	Potassium Pyrosulfite (Potassium Hydrogen Sulfite or Potassium Metabisulfite)	1957
91	Disodium Glycyrrhizinate	1969	273	Sodium Pyrosulfite (Sodium Hydrogen Sulfite, Sodium Metabisulfite, or Acid Sodium Sulfite)	1957
93	Gluconic Acid	1957	274	Tetrapotassium Pyrophosphate (Potassium Pyrophosphate)	1957
98	L-Glutamic Acid	1964	281a	Sodium Pyrophosphate (Crystal) (Tetrasodium Pyrophosphate)	1957
99	Monopotassium L-Glutamate	1991	281b	Sodium Pyrophosphate (Anhydrous) (Tetrasodium Pyrophosphate (Anhydrous))	1957
100	Monocalcium Di-L-Glutamate	1991	282	L-Phenylalanine	1960
101	Monosodium L-Glutamate (Sodium Glutamate)	1948	288	Butylhydroxyanisole	1954
102	Monomagnesium Di-L-Glutamate	1991	289	Fumaric Acid	1957
103	Cinnamic Acid	1962	290	Monosodium Fumarate (Sodium Fumarate)	1960
104	Ethyl Cinnamate	1962	292	Propionic Acid	1983
105	Methyl Cinnamate	1962	295	Calcium Propionate	1963
109	High-Test Hypochlorite	1959	296	Sodium Propionate	1963
111	Monosodium Succinate	1960	298	Propylene Glycol	1954
115	Sodium Chondroitin Sulfate	1963	306	l-Perillaldehyde	1966
131	Saccharin	1961	311	Propyl Gallate	1953
132	SaccharinNa	1948	314	Polyvinylpyrrolidone	1995
136	Sodium Hypochlorite (Hypochlorite of Soda)	1950	316	Potassium Polyphosphate	1957
137	Sodium Hyposulfite (Hydro-sulfite)	1948	317	Sodium Polyphosphate	1957
145	Diphenyl	1971	321	Potassium Metaphosphate	1957
146	Butylated Hydroxytoluene	1956	322	Sodium Metaphosphate	1957
154	Potassium Bromate	1953	344	Disodium 5'-Ribonucleotide (Sodium 5'-Ribonucleotide)	1960
155	DL-Tartaric Acid (dl-Tartaric Acid)	1959	354a	Ferrous Sulfate (Dessicated)	1957
156	L-Tartaric Acid (d-Tartaric Acid)	1959	354b	Ferrous Sulfate (Crystal)	1957
161	Potassium Nitrate	1957	371a	Disodium Hydrogen Phosphate (Crystal) (Disodium Phosphate (Crystal))	1959
162	Sodium Nitrate	1957	371b	Disodium Hydrogen Phosphate (Anhydrous) (Disodium Phosphate (Anhydrous))	1959
163and164	Food Red No.2	1948	372a	Sodium Dihydrogen Phosphate (Crystal) (Monosodium Phosphate (Crystal))	1957
165and166	Food Red No.3	1948	372b	Sodium Dihydrogen Phosphate (Anhydrous) (Monosodium Phosphate (Anhydrous))	1957

Source : "The using standard of food additives, a new publication" (1997), "Food Additives" (Y. Watanabe, 1996), "KORE DE WAKARU SHOKUNO ANZEN DOKUHON (Readings of food safety)" (H. Yamaguchi, 1997) "

Table 6. The Belief Chronological Table Concerning Food Safety and Dietary Life

Year	Food Safety	Agriculture	Dietary Life and Others
1948	The Food Safety Law is enforced.		
1949	Orange juice made in US is imported for the first time.		
1951	Watchmen for food safety.		
1952	Yellowed Rice incident.		
1953	Minamata Disease is broken out.		
1954	The fifth Fukuyumaru is bombed a Hydrogen-bomb. Yellowed Rice incident.		
1955	Moringaga Milk Pollution by Arsenic.		
1956			Coca-Cola is begun to sell.
1957	Hydrocyanic acid is identified from beans. The Food Safety Law is amended.		
1958			Instant food (Chicken Chinese noodle) is begun to sell. US:1958 amendment law of food safety Instant coffee is begun to sell.
1960		The trade liberalization of agricultural products starts, 121 products are emancipated. Soy bean is liberalized.	
1961	Vegetable attached antibiotics is troubled in Tokyo. The use of chemical sweet "CHICRO" increases according to the progress of instant food.		The basic law of agriculture.
1962			Silent Spring "(Rachel Carson) is published. The first meeting of Codex (FAO/WHO joint food standard committee) is held.
1963		Banana, honey, green bean and etc. are liberalized. Sugar is decided to liberalize.	Microwave ovens are begun to sell.
1964		Lemon, paste made from the arum root, seaweeds are liberalized.	
1965	Niigata-Minamata Disease is broken out. AF-2 is designated as a food additive.		
1966	The safety use of pesticides is troubled. "A survey of public opinion on food additives" is held by Prime		
1967	"DULCIN" is deleted from food additives. Bleaching flour for school lunch bread is troubled. "USOTSUKI-SHOKUHIN (deceived food)"		International Grain Agreement.
1968	Remained pesticides criteria is reported by the meeting of food safety survey. Kanemi Rice oil trouble.		
1969	Chemical sweet "CHICRO" is deleted from food additives. The pollution of cow milk by PCB is identified.	55 products are decided to liberalize until the end of 1971.	
1970	The pollution of mothers' milk by BHC and DDT is clarified. The carcinogenic effects of chemical sweet "CHICRO" is pointed out.	11 products, e.g. coffee, are decided to liberalize.	Sky lark (the family restaurant)" and "Kentucky Fried Chicken" are opened.
1971	DDT is stopped to use by consumer movement, after the indication of its carcinogenic effects.	20 products, e.g. grapefruits, are decided to liberalize. Whisky and etc. are liberalized."	Instant cup noodle is begun to sell. "Mr. Donuts" and "MacDonard (hamburger chain)" are opened.

Year	Food Safety	Agriculture	Dietary Life and Others
1972	The regulation of food additives is decided in the National Diet called "KOUGAI KOKKAI (The Diet is against thesell. problem of environmental pollution). The pollution of fishes by PCB.	Ham, bacon, tomato, sugar, mixed fertilizer are liberalized.	KANI ASHI (copy food of crabmeat)" is begun to "KOZO SUSHI (SUSHI chain)" and " Lotteria (cafeteria chain)" are opened.
1973	Saccharin is allowed to use.		"The Pizza Hut" and "Shekeys" are opened. Oil shock. Grain shock.
1974	AF-2 is deleted from food additives. "FUKUGO-OSEN (the complex pollution)" written by Sawako Ariyoshi.		Seven-Eleven (the convenient store)" is opened.
1975	OPP (o-Phenylpheno) and TBZ (Thiabendazole) are identified from lemons made in US, so those are stopped to unloading. Lysine for school lunch bread is stopped to use. The carcinogenic effects of Saccharin is doubted.		
1976	Food Red No.2 (Amaranth) is pointed out its carcinogenic effects.	"HOKKA HOKA TEI (OBENTO Japanese lunch box chain)" is opened.	
1977	OPP (o-Phenylpheno) is designated as a food additives.	Cherry from US is decided to liberalize.	
1978	TBZ (Thiabendazole) is designated as a food additives. The natural food and healthy food are boomed.		
1979	The dietary fibre is looked again.		
1980	Hydrogen peroxide is stopped to use by its carcinogenic effects. THM (trihalomethane) in water.		Pocari Sweat (a sports drink)" is begun to sell.
1981	The criteria of propylene glycole and natural colour are decided.		Chilled food are begun to sell.
1982	Dioxin Pollution is clarified.		
1983	The carcinogenic effects of Potassium Bromate is identified. 11 chemicals, e.g. aspartame, are designated as food additives. The carcinogenic effects of BHA is identified.	US sues Japan of 13 products limitation of import as offense to GATT.	
1984	"OISHI MIZU (good tasted water, one of the mineral water)" boom. Aspartame (chemical sweets)" is started to sell in spite of pointing out of its harmfulness.	6 products, e.g. manufactured pork, are decided to liberalize.	
1985	The mingle of harmful thing in Wine.		
1986	The indicator of food safety produced by gene recomposition technology. Chemobuiri atomic power plant Accident.		
1988	An illegal antibiotics Sulfajimjin is identified from pig. US. The criteria for labelling food additives are amended. Postharvest pesticides problem.		Fibe Mini (drink containing dietary fibre)" is begun to sell."
1989	The number of designated food additives is 347.		
1990	The pollution by pesticides of imported flour is identified. 7 food additives are designated.	12 products, e.g. beefs, apple juice, are liberalized.	Thiramis (Italian cheese cake) and the Italian food are boomed.
1991	Pesticide 2,4-D is identified from imported lemons.	Beef and Orange are liberalized. One of the stockbreeding farmers was killed himself. Orange juice is liberalized.	
1992	The criteria of 34 pesticides residues are decided. Imazalil is designated as a food additive.		

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Year	Food Safety	Agriculture	Dietary Life and Others
1993	The emergent import of rice is done, because the harvest of rice is decreased by cold weather in this year. Post-harvest pesticides are identified from shool lunch bread. Post-harvest pesticides is doubted in imported apple juice. White ant exterminate pesticide is identified in rice from USA . Post-harvest pesticides are resided in 70 % of shool lunch bread. 14% of emergent imported rice is polluted by pesticides. TBZ is identified in apples from US.		
1994			
1995	The way of food labelling is changed from the produced date to the limit date for eating .		WTO is started on January 1st.
1996	The amended Food Safety Law is put in force. The criteria is loose to international standard. 5 products, e.g. garlic, broccoli, are obliged to label the county of origin. Kyogyu disease: O-157.	The whole trade liberalization era of agricultural products starts.	Our Stolen Future” (I.Colborn, D.Dumanoski and J. Peterson Myers) is published.

Source: “Food additives” (Y.Watanabe, 1996) , “International Perspectives of Food Safety Standards” (R. Kada, 1997) , “TABEMONO TSUSHIN” (1995/8)