

Secular Changes in Body Height and Weight of Population in Japan since the End of WW II in Comparison with South Korea

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“It (stature) is a net measure that captures not only the supply of inputs to health but demands on those inputs.” (R.H. Steckel, *Jr. Econ. Literature*, 1995, p.1903)

Introduction

A small group of researchers, including the author, in Japan and the United States have been engaged in the econometric analyses of food consumption mainly in Japan from the age/generation perspectives (Mori eds., *Cohort Analysis of Food Consumption in Japan*, 2001; Mori et al., *Declining Orange Consumption in Japan: Generational Changes or Something Else?*, 2009; Mori, Saegusa, and Dyck, “Structural Changes in Demand for Foods in a Rapidly Aging Society,” 2016; etc.).

Due to the data source, *Family Income and Expenditure Survey*, on which we relied, our analyses have been focused on at-home food consumption, with little attention to the increasing eating out particularly among the young generations. And yet, we have discovered appreciably declining tendencies in per capita consumption of a number of major food products—rice, fresh fish, fresh fruit and vegetables and even milk among the younger age groups, regardless of sex in the past two or three decades. Per capita at-home consumption of fresh fish and fresh fruit, in particular, by non-adults and those young adults in their 20s and 30s is estimated to have decreased drastically in the past 30 years or so, as compared to the older generations, which have not changed appreciably in consumption. As a consequence, those in their teens and their 20s are estimated to consume around one-tenth of fresh fruit, compared to those in their 60s and above in recent years. The same phenomenon has taken place for fresh vegetables, although to a much lesser degree. Per capita at-home consumption of fresh meat has increased moderately over the period across the board, with the consumption by the high-teens and young adults in their 20s and 30s only some 10% more than 30 years ago, far less than needed to compensate for the drastic decreases in fish consumption by these young age groups (refer to Table 1, for details).

National Nutrition Survey by the Ministry of Health, Labor, and Welfare, initiated at the advice of the Occupation Forces soon after WW II, started to publish nutrition intakes by the age groups in the annual report of KOKUMINN EIYOU no GENJYOU (*Present Situation of National Nutrition*) in 1995. Per capita total caloric intake from all sources, including alcoholic beverages, is reported to have increased from approximately 2,100 (kilo) calories in 1950 to 2,230 calories in the peak period of the early 1970s, and then gradually

Table 1 Changes in per capita At-home Consumption of Selected Food Products by Age Groups in Japan, 1980-2010

A: Fresh Fruit (kg/year)					B: Fresh Vegetables (kg/year)					C: Fresh Meats (kg/year)				
age/year	1980-81	1989-91	1999-01	2009-11	age/year	1980-81	1989-91	1999-01	2009-11	age/year	1980-81	1989-91	1999-01	2009-11
15~19	29.0	15.4	7.6	4.4	15~19	53.0	42.3	33.5	34.6	15~19	16.2	16.9	16.1	16.8
20~24	30.3	16.8	10.3	7.8	20~24	55.0	45.0	38.2	37.4	20~24	13.0	13.3	13.4	14.1
25~29	31.5	19.4	13.5	12.0	25~29	56.3	47.4	42.9	41.3	25~29	12.4	12.2	12.2	13.9
30~34	39.7	27.2	18.5	15.2	30~34	61.2	51.7	47.1	45.3	30~34	12.9	12.4	12.9	14.4
35~39	47.0	36.1	24.3	17.9	35~39	68.3	57.2	51.8	48.8	35~39	13.5	13.2	12.9	15.0
40~44	49.8	42.8	31.0	20.4	40~44	75.6	66.6	58.0	52.4	40~44	13.6	14.5	13.8	15.6
45~49	53.9	48.4	36.0	24.7	45~49	83.3	76.4	65.5	56.9	45~49	13.5	15.1	14.4	15.8
50~54	56.9	51.0	44.4	30.9	50~54	89.2	81.6	75.3	62.9	50~54	13.0	14.0	14.6	15.7
55~59	57.4	55.9	51.7	39.3	55~59	91.6	87.0	84.9	71.5	55~59	12.0	12.9	14.4	15.8
60~64	58.4	59.3	58.1	48.9	60~64	93.3	90.4	90.7	81.5	60~64	11.7	12.0	13.8	16.1
65~69	56.3	59.8	61.2	54.9	65~69	92.1	91.2	93.5	86.2	65~69	10.4	10.5	12.2	14.6
70~74	55.5	60.3	62.5	57.6	70~74	85.1	85.0	89.8	85.6	70~74	9.0	9.0	10.4	12.4

D: Fresh Fish (kg/year)					E: Fluid Milk (lt/year)					F: Rice (kg/year)				
age/year	1980-81	1989-91	1999-01	2009-11	age/year	1980-81	1989-91	1999-01	2009-11	age/year	1980-81	1989-91	1999-01	2009-11
15~19	10.9	7.9	5.0	2.9	15~19	26.8	28.3	25.9	19.5	15~19	50.1	29.4	18.3	15.8
20~24	11.4	7.9	5.9	3.7	20~24	28.8	26.6	22.9	19.1	20~24	38.0	24.9	16.4	13.2
25~29	12.2	7.9	6.6	4.8	25~29	29.8	26.9	21.8	19.3	25~29	34.1	23.4	18.2	14.2
30~34	14.1	10.2	7.9	6.1	30~34	27.8	31.4	27.4	21.7	30~34	40.7	27.3	21.2	18.0
35~39	15.4	12.3	9.8	7.4	35~39	21.3	31.8	33.1	24.5	35~39	48.9	35.1	26.9	22.2
40~44	15.6	14.6	12.5	8.7	40~44	20.0	32.8	36.7	27.1	40~44	58.1	44.8	32.7	26.3
45~49	16.7	17.1	15.2	10.2	45~49	21.8	31.9	36.3	28.4	45~49	61.8	50.1	37.4	29.0
50~54	18.6	18.5	18.3	12.1	50~54	23.0	31.1	34.6	28.8	50~54	60.7	52.6	42.8	31.0
55~59	19.8	19.1	20.2	14.6	55~59	22.4	32.8	35.2	30.1	55~59	59.6	54.3	48.0	34.7
60~64	19.9	19.3	20.3	17.2	60~64	23.6	35.7	37.7	32.3	60~64	60.9	53.1	49.9	39.8
65~69	18.5	18.8	19.9	18.2	65~69	24.6	36.9	40.9	34.8	65~69	59.7	51.2	50.3	43.8
70~74	17.1	17.8	18.7	17.2	70~74	25.0	37.3	43.5	37.0	70~74	54.2	46.2	46.1	42.3

Sources: calculated by Mori, using FIES data with the TMI model.

declined to approximately 2,000 calories in the mid-1990s, and further down to approximately 1,850 calories, presumably reflecting a significant, rapid aging of the population.

Over the normal life cycle, ordinary people consume the largest amount of foods in their mid-teens and total caloric intake per person gradually declines as they age toward their elderly years. According to the *Nutrition Survey* age classification, males in the age group, 15-19 years old consume the largest amount of calories, followed by those in their 20s to 50s, and females in the age group of 7-14 take nearly equal or slightly larger amount than the late teen age groups. Males in their high-teens of 15-19 are estimated to take approximately 2,500 calories per day per person in the mid-1990s and have kept their caloric intakes almost constantly at this level until 2014, the latest survey year. As will be shown in the subsequent section, Japanese males of 20 years of age have not grown either in body height or weight during the corresponding years in the past. As they have not eaten more, they have not grown bigger, or they have ceased growing, because they have quit eating more. To be exact, the author should be happier, if we could state more specifically that the young Japanese have ceased to grow for some time in height, in particular, because they have not learned to eat more properly. As will be shown in the later section, the Japanese young in their early 20s have been lower in body height than the Korean peers by approximately 4 cm in the recent decade, and 12-13 cm lower than those in the world's tallest nation, the Netherlands, no to speak of.

Secular Changes in Body Height in the Western Nations

It is widely conceived in Japan that Americans have long been very tall. It is also conceived that Europeans have long been tall, i.e., vaguely people in North: Sweden, Norway, Netherlands, etc. the tallest, followed by those in Middle: G. Britain, Germany, Austria, etc., and those in South: France, Italy, etc. somewhat shorter than the above nations. As the westerners are distinctly different in skin complexion from the Northeast Asians, so are they tall in body height as a racial feature, so to speak. This is the concept which has been commonly held by many people. However, research contradicts this belief, such as the articles: "Stature and the Standard of Living" by Steckel; "Economic Growth, Population Theory, and Physiology" by Fogel, and a few other papers (provided courtesy of Professors S-W Park, and J-S Moon, pediatricians in S. Korea).

Surprisingly, young male adults in the Netherlands, the currently the tallest nation in the world, were 164cm, 3cm shorter than those in France in 1850 and that the peers in Sweden and Norway were 168cm and 169cm, respectively then. On average, Europeans have grown more than 10cm taller in the past 100 years (Hatton, 2013). The data regarding male body height in the 19th century were mainly based on the military draft exams. Therefore, the statistics provided in Tables 2-3 and Figure 1 can be relied with certain confidence, although 1-2 cm differences on both time-series and cross-sectional comparisons should be

Table 2 Secular Changes in Adult Male Stature in The Western Nations, 19th century to 20th Century
(cm)

	U.K.	Norway	Sweden	France	Denmark	Hungary
19-I	168.0	—	166.7	164.3	165.4	163.9
19-II	171.6	—	168.0	165.2	166.8	164.2
19-III	169.3	168.6	169.5	165.6	165.3	—
20-III	175.0	178.3	177.6	172.0	176.0	170.9

Source Fogel, "Economic Growth", *AER*, 84(3), p. 372.

Table 3 Secular Changes in Adult Male Stature in The Western Nations, 1800–1950

	U.S.	U.K.	Sweden	Norway	Nethlands	France	Aus/Hung
1800	173	167	166	166		163	163
1850	171	166	168	169	164	167	
1900	171	167	172	171	169	165	
1950	175	175	177	178	178	170	171

Source: Steckel, "Stature," *Ec. Literature*, XXXIII, p. 1919.

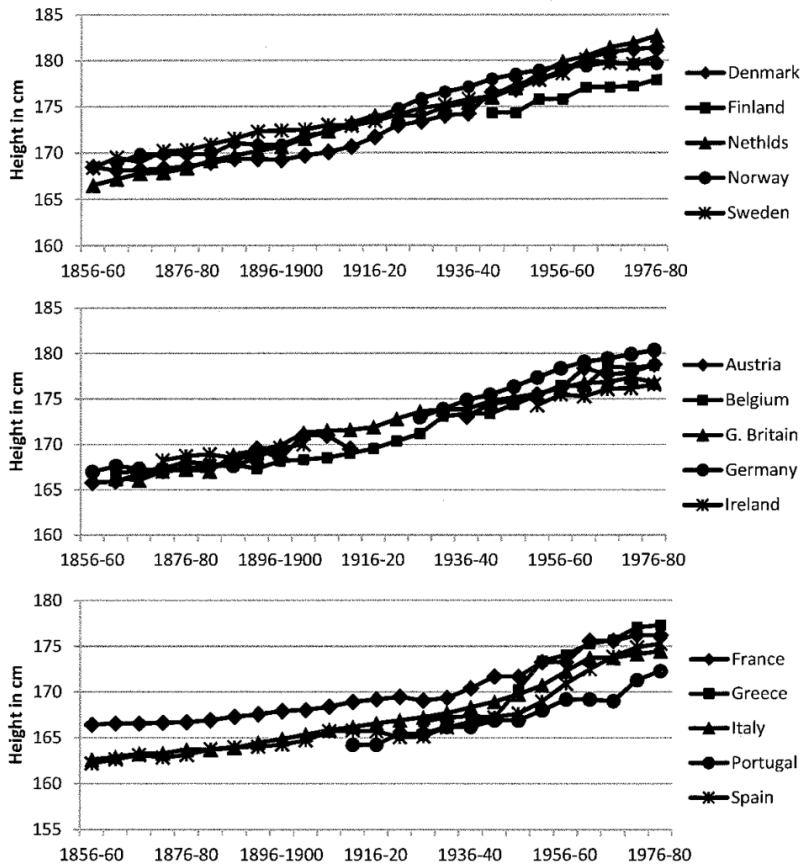


Fig.1 Adult male height by birth cohort, 1856–60 to 1976–80.

Source: transcribed from Hatton, "Europeans so tall," p.3.

regarded within the statistical errors. The most important fact to be kept in mind is that the young male adults have grown more than 10cm taller over the 100 years or so since the late 1800s in most European countries. Hatton (2013) seems to attribute the growth in body height, if only statistically, to the fall in infant mortality. The infant mortality rate is measured as: the number of deaths within one year after birth/the number of births, which may reflect the disease environment in the chosen short period. It is, however, questionable that the fall in infant mortality was “the most important proximate source of increasing height” (Hatton, p.1). At any rate, one of the key findings in this section is that people can grow conspicuously in height, regardless of race and geographical locations, if the environmental conditions allow it.

Changes in Body Size of Japanese People after WW II

Japanese young males in their 20s were 161.6 cm tall (on average, to be omitted afterword) in 1950 and those in their 30s and 40s, who were in their 20s in 1940 and 1930, respectively were 160 cm, implying that the young adults had not grown much taller until 1950 or so. They grew 1.0 cm taller from 1950 to 1960 and grew 3.0 cm taller in the next decade and again 3.0 cm taller to 168.5 cm in 1980 and grew to 170.7 by 2.2 cm in 1990 and ceased to grow any taller since then at 171.0 cm in 2010. The young Japanese males grew nearly 10 cm in height during the 50 year period from the mid-20th century. The exact same growth patterns in height are observed in the young females, i.e., they grew from 150.2 cm in 1950 to 157.3 cm in 1990 and then ceased to grow since then (0.5 cm taller in 2010, probably within the range of statistical errors).

Those males in their 50s grew taller steadily from 163.2 cm in 1990, to 165.8 cm in 2000 and 168.3 cm in 2010. Those in their 50s in 1990 were born in the 1930s. These cohorts were in their 20s in 1960 and those in their 50s in 2010 were in their 20s in 1980. With these cohort aspects taken into consideration, it is fair to state that population in Japan ceased to grow in height around 1990 and won't grow any taller from now, unless boys and girls under 20 years of age now restart growing taller appreciably any more than at present again for unpredictable reasons in the near future (Table 4).

As regards body weight, Japanese males have grown heavier accordingly in all age classes, mid-teens, 20s, 30s, 40s, 50s, 60s, and 70+. Particularly, Japanese males in the middle to elderly age groups seem to have grown heavier in weight relative to height, whereas those in their mid-teens and 20s have grown only a little heavier since 1990. On the other hand, female population, those in the younger age groups, in particular, have grown much less in weight than the male counterparts. Those in their 20s, for example, grew in height by 7.6 cm from 150.2 cm in 1950 to 157.8 cm in 2010 but they grew from 49.8 kg to 51.3 kg in weight over the corresponding period. Those in the middle to the elderly age groups, however, have grown appreciably in weight, like the male peers seen above, as demonstrated in terms of BMI in Table 5. The female population in their 20s and 30s have

Table 4 Changes in Body Height and Weight by Age Groups and Sex in Japan, 1950–2010

(A) Height_Males (cm)							
age/year	1950	1960	1970	1980	1990	2000	2010
4–6	102.6	105.0	108.1	109.1	110.2	109.9	110.8
14–16	152.1	157.8	163.0	165.7	166.6	167.6	167.7
20–29	161.6	162.6	165.5	168.5	170.7	171.1	170.8
30–39	160.4	161.7	163.3	166.0	168.9	170.9	171.5
40–49	159.2	160.0	162.0	163.2	166.5	169.0	170.4
50–59	157.7	158.7	160.0	161.3	163.2	165.8	168.3
60–69	154.4	156.8	157.7	159.1	161.0	162.9	165.3
70+	154.0	154.3	155.5	156.6	158.2	159.7	160.9
Weight_Males (kg)							
age/year	1950	1960	1970	1980	1990	2000	2010
4–6	16.58	17.13	18.07	18.63	19.06	18.99	18.89
14–16	44.21	48.44	52.80	55.58	56.80	57.36	56.39
20–29	55.44	56.22	58.74	61.44	64.51	65.47	65.34
30–39	55.04	56.23	59.33	62.24	65.39	68.93	70.13
40–49	54.48	56.01	58.50	61.42	64.46	67.80	70.23
50–59	53.20	54.50	56.63	58.98	62.20	64.97	67.90
60–69	51.29	52.29	54.32	56.41	59.09	62.23	64.70
70+	49.09	49.43	50.79	52.66	55.14	57.77	60.00
(B) Height_Females (cm)							
age/year	1950	1960	1970	1980	1990	2000	2010
4–6	101.6	104.0	107.4	108.4	109.1	108.7	110.5
14–16	148.0	151.1	154.0	156.0	157.0	157.4	157.2
20–29	150.2	151.4	153.3	155.4	157.3	157.8	157.8
30–39	148.8	150.2	151.7	153.4	155.8	157.6	158.2
40–49	147.4	148.8	150.4	151.8	153.5	155.9	157.8
50–59	145.7	147.0	148.3	149.6	151.3	153.2	155.1
60–69	143.5	144.2	145.3	147.1	148.5	150.6	152.3
70+	141.0	140.6	141.6	142.2	144.4	146.2	147.4
Weight_Females (kg)							
age/year	1950	1960	1970	1980	1990	2000	2010
4–6	16.01	16.60	17.65	18.14	18.58	18.50	18.74
14–16	44.09	46.89	49.30	50.17	50.07	50.46	49.83
20–29	49.84	49.40	50.36	50.78	51.28	51.00	51.26
30–39	49.25	49.24	51.52	51.97	52.72	53.37	53.93
40–49	48.25	49.57	52.01	53.46	53.60	54.73	55.40
50–59	46.69	47.87	50.61	52.05	53.50	54.40	54.30
60–69	44.80	45.73	47.78	49.85	51.73	53.47	53.40
70+	41.82	42.41	44.03	45.79	47.69	49.33	49.93

Sources: Health and Labor Ministry, *National Nutrition Survey*, various issues.

Table 5 Changes in BMI by Age Groups and Sex in Japan, 1950–2010

(A) BMI_Males

age/year	1950	1960	1970	1980	1990	2000	2010
5	15.74	15.53	15.45	15.64	15.69	15.71	15.38
15	19.12	19.46	19.86	20.24	20.47	20.41	20.05
25	21.24	21.26	21.45	21.63	22.14	22.36	22.40
35	21.40	21.51	22.26	22.58	22.92	23.60	23.85
45	21.50	21.88	22.30	23.05	23.25	23.73	24.19
55	21.39	21.64	22.11	22.66	23.35	23.63	23.97
65	21.52	21.27	21.84	22.28	22.80	23.44	23.69
75	20.70	20.76	21.01	21.48	22.05	22.66	23.19

Notes: BMI=(weight in kg)/(height in meter)²
age 5=ave(4:6)
age15=ave(14:16)
age25=ave(20:29)
age35=ave(30:39)
age75=ave(70+)
each annual year=3 year average, like 1950=ave(1949:1951)

(B) BMI_Females

age/year	1950	1960	1970	1980	1990	2000	2010
5	15.51	15.34	15.30	15.45	15.60	15.67	15.34
15	20.13	20.55	20.78	20.61	20.32	20.37	20.17
25	22.08	21.55	21.43	21.03	20.71	20.48	20.59
35	22.24	21.83	22.40	22.09	21.71	21.50	21.56
45	22.20	22.39	23.00	23.20	22.76	22.52	22.24
55	21.99	22.15	23.02	23.27	23.38	23.18	22.58
65	21.77	21.99	22.63	23.03	23.46	23.57	23.02
75	21.04	21.45	21.97	22.66	22.87	23.07	22.97

Sources: calculated by the author, using the data in Table 4:

been consistently declining in BMI, from 22.1 and 22.2 in 1950 to 20.6 and 21.6 in 2010, respectively. The authors hear that young Japanese women, not few in number, are excessively concerned about "dieting" without good reasons.

The author has been told by the medical professionals that what matters in BMI is the tendencies in the percentage or distribution of obese or near-obese people in population of any age groups, regardless of sex. This paper cannot dig into this topic, due to the absence of data and the author's analytical inability in this field.

Comparison of Body Growth Patterns of Japanese and S. Korean Children

A few months ago, the author came across a short story in *Chosun Ilbo* on the internet, "high-school senior boys in Korea have stopped growing in height but keep growing in weight,"(February 25, 2016). He had been well aware of the similar phenomena in Japan for some time, but when he compared the reported average height of senior boys at 173.5

cm at the *2015 School Children Health Survey* with that of Japanese peers, boys of 17 years of age, reported in the *2013 National Nutrition Survey*, he was shocked to realize that the Korean senior male students were 3 to 4 cm taller (on average, to be omitted afterward) than the Japanese boys of the same age in 2010-13.

By the courtesy of *Chosun Ilbo* reporters, the author was able to communicate with Professors Soon Woo Park and Jin-Soo Moon, who administered the 2015 school health survey. Prof. Moon was very kind to send him the related data and a couple of important literatures in the field of anthropometric analyses. With very little background in clinical nutrition, physiology, physical education, etc., he tried his best to compile as reliable statistical data as possible on secular changes of body size of children by broad age categories in Korea and Japan from 1965 to present.

The surveys of body size by age have been conducted across the country every year since the end of WW II in Japan, whereas the survey on body size in Korea has been conducted in conjunction with school health surveys on selected years only, as he presumes. Although the sample sizes are quite large in both countries, the number of children in each age cell, classified by one year bracket is limited, with substantial variance in survey data, e.g., mean height of boys of 15 years of age in 2004, 2005, and 2006 are 167.8, 169.5 and 166.8 cm, respectively and mean height of boys of 14, 15, and 16 years of age in 2005 are 165.9, 169.5, and 168.2 cm in the *National Nutrition Surveys*. For the purpose of smoothing, mean values of height of boys in 14, 15, and 16 years of age in three years of 2004, 2005, and 2006 are simply averaged to represent that of 15 years old boys in 2005 for the Japan's case and three age classes are simply averaged in a single year, 1965, 1975, 1985, 1997, and 2005, respectively, in Korea as published in the survey articles provided by Professor Moon.

Table 6-A and Table 6-B provide the secular changes in (mean) body height of boys and girls from 5 year olds to 20 year olds from 1965 to 2005 in Korea and Japan, respectively.

With minor differences in detail ignored, at least two distinct features should be stressed. Koreans have become taller by 3-4 cm than Japanese at the age of 20 years at present, either males or females. They were the same in height in the mid-1980s, boys at 170 cm and girls at 157 cm, respectively. Koreans kept growing taller and Japanese ceased to grow in height since then. In the mid-1970s, at the age of 15 years old, Japanese boys were 164.2 cm, nearly 6 cm taller than the Korean peers. They aged to their mid-20s in 1985, where both Koreans and Japanese were the same in height, 170 cm, implying that Korean boys grew substantially faster than Japanese boys after the age of mid-teens during that period. Exactly the same thing took place in the last decade of investigation, i.e., both Korean and Japanese boys at the age of 15 years old were the same in height at 167 cm in 1997 and the former grew to 174.4 cm and the latter to 171.5 cm in 2005. In the related literatures, we often come across the technical word of "adolescent growth spurt" in height growth (Murata and Hibi, 1992, pp.94-95; Kouchi, 1996, pp.332-334; etc.). Observing the growing patterns of Japanese boys, they seem to have been following (on average) this concept. In this respect,

Table 6-A Comparisons of Body Height by Age Groups of Male Children:
Korea and Japan, 1965 to 2005

(cm)

year	1965	1964-66	1975	1975-76	1985	1984-86	1997	1996-98	2005	2004-06
age_yr. old	Kr	Jp	Kr	Jp	Kr	Jp	Kr	Jp	Kr	Jp
4-6 ave	100.9	107.4	104.5	108.6	108.0	109.4	109.6	109.3	110.9	110.1
9-11ave	128.2	133.4	131.7	136.1	135.3	137.2	138.1	138.3	141.6	138.6
14-16 ave	156.0	161.6	158.6	164.2	163.5	166.1	167.2	167.3	170.0	167.4
19-21 ave	168.8	165.4	168.4	167.4	170.1	170.6	173.3	171.2	174.4	171.5

Table 6-B Comparisons of Body Height by Age Groups of Female Children:
Korea and Japan, 1965 to 2005

(cm)

year	1965	1964-66	1975	1975-76	1985	1984-86	1997	1996-98	2005	2004-06
age_yr. old	Kr	Jp	Kr	Jp	Kr	Jp	Kr	Jp	Kr	Jp
4-6 ave	100.2	106.1	103.3	107.8	107.5	108.7	108.5	108.8	109.8	109.5
9-11ave	128.0	134.1	131.9	136.8	135.8	138.3	138.0	139.2	142.1	139.5
14-16 ave	152.2	153.2	153.9	154.8	155.8	156.3	158.9	156.7	159.7	157.0
19-21 ave	155.8	153.7	157.1	155.0	157.4	157.0	160.3	158.2	161.5	158.5

Notes: simple averages of 19 and 20 years olds for Korea.

Sources: Ji-Yeong Kim et al., 2009 for Korea and *National Nutrition Survey*, various issues for Japan.

Korean boys seem to differ distinctly from the Japanese peers.

Girls mature a few years earlier than boys, i.e., their puberty starts a couple of years earlier than boys and their physical maturity is reached around 17-18 years of age, a few years earlier than boys. Therefore, a slightly different age classification should be prepared from that for boys. The absence of professional knowledge in this area prevents us from preparing the tables with different age classification in this article. As early as in 1965, Japanese girls at the age of 15 years old were 153.2 cm, 1.0 cm taller than the Korean peers but 10 years later in 1975 Japanese girls at the age of 20 years old were 155.0 cm, 2.1 cm shorter than the Korean peers then. Again in 1985, the Japanese girls of 15 years old were 156.3 cm, 0.5 cm taller than the Korean peers then but in 1997, Korean girls of 20 years of age were 160.3 cm, 2.1 cm taller than the Japanese peers then.

Table 7-A and Table 7-B provide the secular changes in (mean) body weight of boys and girls from 5 year olds to 20 year olds from 1965 to 2005 in Korea and Japan, respectively. Compared at the maturity age of 20 years old, in 1985 either Korean boys or girls were the same in weight as the Japanese peers: boys at 61 kg and girls at 51 kg. Some 10 years later, in 1997, Japanese boys at the age of 15 years old were 56.7 kg, only 1.2 kg lighter than the Korean peers who were 57.9 kg. Again 10 years later in 2005, Korean boys at the age of 20 years old were 70.8 kg, 6.9 kg heavier than the Japanese peers. The similar phenomena are observable, i.e., in 1985, Japanese girls of 15 years old were 50.1 kg, 0.9 kg heavier than the Korean peers. But in 1997, Korean girls of 20 years of age were 55.3 kg, 4.0 kg heavier than the Japanese peers, who were 51.3 kg then.

Table 7-A Comparisons of Body Weight by Age Groups of Male Children:
Korea and Japan, 1965 to 2005

(kg)

year	1965	1964-66	1975	1975-76	1985	1984-86	1997	1996-98	2005	2004-06
age_yr. old	kr	jp	kr	jp	kr	jp	kr	jp	kr	jp
4-6 ave	15.8	17.7	16.7	18.3	17.9	18.7	19.1	18.6	19.9	18.7
9-11 ave	25.7	29.5	27.3	31.8	29.5	33.0	34.7	34.4	39.1	34.4
14-16 ave	45.1	51.1	46.9	54.4	51.9	56.4	57.9	56.7	64.2	57.5
19-21 ave	58.2	57.0	58.7	59.1	61.1	61.8	66.3	63.2	70.8	63.9

Table 7-B Comparisons of Body Weight by Age Groups of Female Children:
Korea and Japan, 1965 to 2005

(kg)

year	1965	1964-66	1975	1975-76	1985	1984-86	1997	1996-98	2005	2004-06
age_yr. old	Kr	Jp	Kr	Jp	Kr	Jp	Kr	Jp	Kr	Jp
4-6 ave	15.6	17.1	16.1	18.3	17.4	18.3	18.5	18.6	19.2	18.6
9-11 ave	25.9	29.6	27.2	31.8	29.6	33.1	33.8	34.0	37.6	34.0
14-16 ave	44.0	48.0	46.4	49.3	49.2	50.1	52.5	49.9	54.7	51.0
19-21 ave	51.3	50.3	51.6	50.2	51.7	50.8	55.3	51.3	55.7	51.7

Notes: the same as Table 6.

Sources: the same as Table 6.

What can be presumed to have caused these differences? The author can claim with confidence that anything related to racial matters is no answer; per capita net national income cannot be an answer again, because Japan is even today a little greater than Korea in net per capita income, despite the long-lasting economic stagnation after the Japan's economic bubble burst in the early 1990s.

In the past month or so, what caught his mind is Original Article: "South Korea's entry to the global food economy: shifts in consumption of food between 1998 and 2009," *Asia Pac J Clin Nutr* 2012 (Lee, Duffey, and Popkin). The authors emphasize that one of the unique features of food consumption in Korea is that vegetable intake has remained high, with Kimchi the largest contributor to vegetable consumption: its per capita consumption has risen steadily since 1969, increasing from 58 g to 117 g/day in 2009 (p.619). In addition, the daily per capita intake of fruits has also been increasing over time, with particularly rapid change in the 1990s. In 1995, 146 g of fruits were consumed, and this is almost a 10-fold increase from the 18.9 g consumed in 1970, and this trend has continued until 2009 (p.622); see Table X and Table XX in **Supplementary Data** for details. These changes in the Korean diet in the past few decades are just opposite to what has been taking place in Japan over the same period in at-home food consumption, particularly among the younger age groups, as we briefly mentioned in the Introduction (Table 1).

It was only yesterday while drafting this last section, when the author came across the statement, "recent epidemiological studies have shown an association between fruit and vegetable intakes with the bone density in both young and elderly subjects," Prospective Cohort Study by Sugiura and his colleagues, 2012, which refers to "fruit and vegetable

intakes and bone mineral density,” by Prynne et al., 2006; “fruit and vegetable consumption and bone mineral density,” by McGartland et al., 2004; etc. A sincere appreciation goes to Dr. M. Maotani who kindly introduced Dr. Sugiura to the author last week.

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Supplementary Data:

Tables X and XX provide changes in per capita supply of fruits in selected countries from 1965 to 2010.

Table X Changes in per capita supply of fruits*, selected countries, 1965 to 2010

	(kg/year)					
	Netherlands	Sweden	USA	UK	R. Korea	Japan
1965	74.43	72.34	76.19	58.72	9.86	39.00
1975	84.64	85.80	100.92	54.96	14.63	61.87
1980					23.25	
1985	93.83	75.44	109.13	64.80	35.13	51.88
1990					46.98	
1995	144.42	82.02	111.16	78.85	69.60	53.24
2000					69.56	
2005	131.58	109.75	109.84	127.02	76.12	60.31
2010	120.19	119.16	102.74	123.30	69.17**	50.82**

Notes: * fruits for wine excluded; ** 2009–2011 averages for Korea and Japan.

Sources: FAOSTAT: Food Balance Sheets.

Table XX Changes in per capita supply of oranges • mandarins and apples, selected countries, 1965 to 2010

	(kg/year)											
	Netherlands		Sweden		USA		UK		R. Korea		Japan	
	oranges	apples	oranges	apples	oranges	apples	oranges	apples	oranges	apples	oranges	apples
1965	20.05	26.30	17.72	18.59	22.45	12.75	9.50	13.22	0.04	5.23	12.28	10.26
1975	25.80	30.55	26.35	23.91	41.03	14.45	11.54	12.81	1.87	7.16	30.94	7.30
1985	28.89	30.52	18.60	22.05	37.01	23.12	14.12	15.96	9.61	11.63	21.08	6.82
1995	54.55	32.14	24.93	15.34	39.65	20.01	18.10	16.90	25.75	14.75	14.18	14.14
2005	40.20	28.44	33.62	25.09	30.89	23.67	40.40	29.65	23.16	7.37	12.35	19.64
2010	27.04	25.02	47.89	19.86	27.98	24.78	37.54	28.01	20.47*	5.29*	10.00*	15.27*

Notes: oranges include mandarins; * 2009–2011 averages for Korea and Japan.

Sources: FAOSTAT: Food Balance Sheets.

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