

KSFE-ILSI Korea Symposium
Sustainable Technologies for minimizing loss of food commodity
11-12 November 2015, Jeju

Future Direction to Achieve Sustainable Food security in Korea

Food Industry perspective

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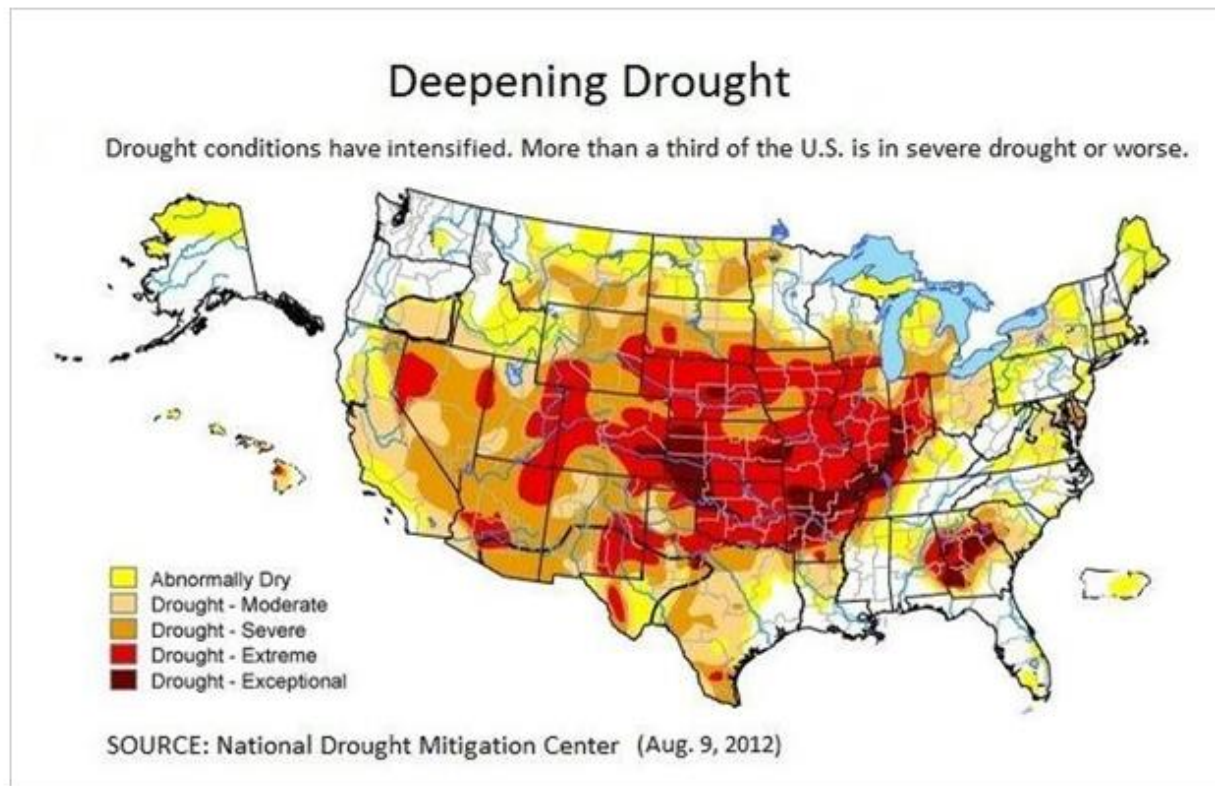




Contents

1. Factors causing global food crisis
2. Korean food situation
3. Role of food industry
4. Hurdles to Korean food industry
5. Korea unification and food security
6. Food policies suggested

Grain prices soar as drought impact deepens



By John W. Schoen, NBC News

The worst American drought in more than half a century is driving up grain prices and deepening worries about global food shortages.

Corn prices hit record as crops shrivel

CNNMoney

31 comments

By Hibah Yousuf July 31, 2012: 9:55 AM ET

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Corn and soybean prices



Click the chart to check prices of corn, soybeans and other commodities.

Corn prices surged to a new record high Tuesday, as the worst drought in more than 50 years continues to plague more than half the country.

Almost 90% of the United States' corn crops are in drought ravaged areas, according to the U.S. Department of Agriculture, and nearly 40% are situated in the hardest hit spots.





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Surging grain prices could drive up S. Korea's inflation rate: Goldman Sachs

2012.07.31 13:27:06 | 2012.07.31 15:55:29

싸이월드 트위터 페이스북 미투데이

Rising grain prices would drive up South Korea's inflation rate by a maximum of 0.4 percentage points, according to an investment bank Tuesday.



The world-renowned investment bank (IB) Goldman Sachs warned that upsurges in international grain prices could lead to spikes in food prices and eventually trigger "Agflation" in Korea, thus pushing up the nation's inflation rate by 0.2 to 0.4 percentage points from the end of this year to early next year, according to the Korea Center for International Finance (KCIF).

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Although the food ingredients price stabilized in 2013 after the food price hike in 2007/2008, the price hike of processed foods in Korea occurred in 2013-2014.

표 1-3 주요 제품 가격 인상현황

인상시기	업체명	품목	인상률
2013.09	서울우유	흰우유	10.8%
2013.09	매일유업, 남양유업	흰우유	8.5%(리터당 200원)
2013.09	빙그레	바나나맛우유, 요플레 등	7.3~8.3%
2013.11	서울우유	생크림, 버터, 발효유 등	8~10%
2013.11	빙그레	아이스크림(투게더 액실런트)	10~16.7%
2013.11	롯데제과	과자 9개 품목	2.9~11.1%
2013.12	해태제과	과자 7개 품목	평균 8.7%
2013.12	오리온	과자 6개 품목	평균 11.9%
2013.12	LG생활건강	음료	6.50%
2014.02	삼립식품	빵	6.40%
2014.02	롯데제과	음료	6.50%
2014.04	남양유업	분유	8.2~11.1%
2014.04	CJ제일제당	쇠고기다시다 등 17개 품목	5.2~9.6%
2014.05	롯데푸드	햄	9.40%
2014.06	CJ제일제당	햄	8.8~9.3%
2014.06	동원F&B	햄	9.60%
2014.08	동서식품	인스턴트 커피, 커피믹스	4.8~4.9%

자료: 신한금융투자 리서치센터, 각종 언론보도 종합

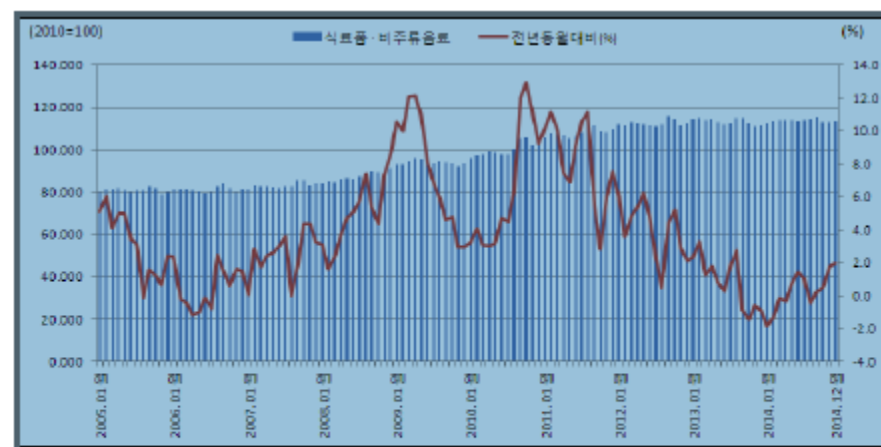


그림 1-9 식료품·비주류음료 소비자물가지수 추이(2005~2014)

주: 품목별 소비자물가지수(지출목적별: 2010=100), 증감율은 전년동월대비

자료: 통계청, 소비자물가조사



Disputes on global food crisis

- Is world food production sufficient to feed world population – a matter of distribution?
- Will it be sufficient in the future?
- Is national food self-sufficiency meaningful in the globalized world?
- Is globalization helpful for the countries of food shortage?

World grain production and trade



Total grain production 2.5 billion M/T

Item	Production(M/T)	Trade(M/T)
Wheat	659.7 million	131.3 million(20%)
Rice	440.1 million	30.2 million(7%)
Corn	802.4 million	91.8 million(11%)
Soybean	231.1 million	80.8million(35%)

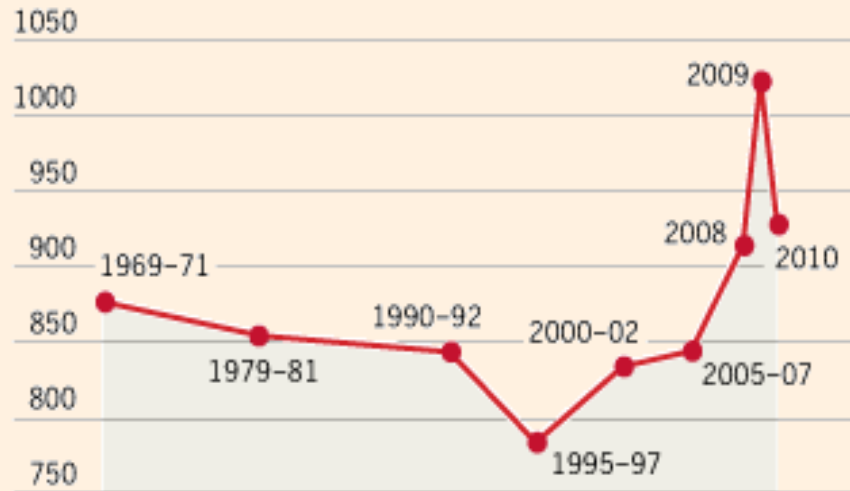
*2007-2010 average

World distribution of undernourished people



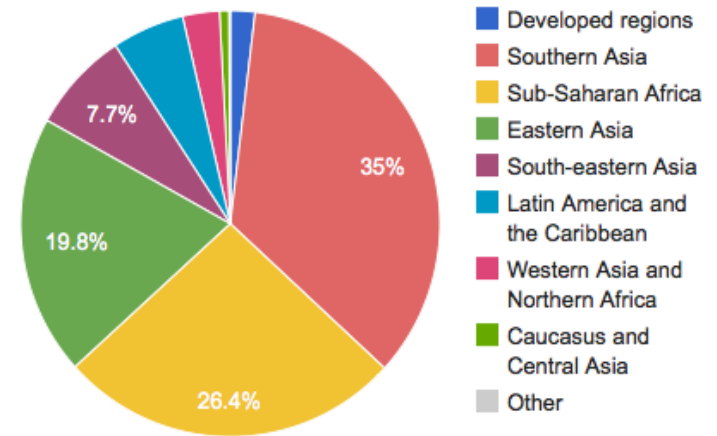
Number of undernourished people in the world

Million



The overall majority of people struggling from hunger live in developing countries with a number of (827 million), where an estimated 14.3% are thought to be undernourished.

Number of undernourished people, by region, 2011-13



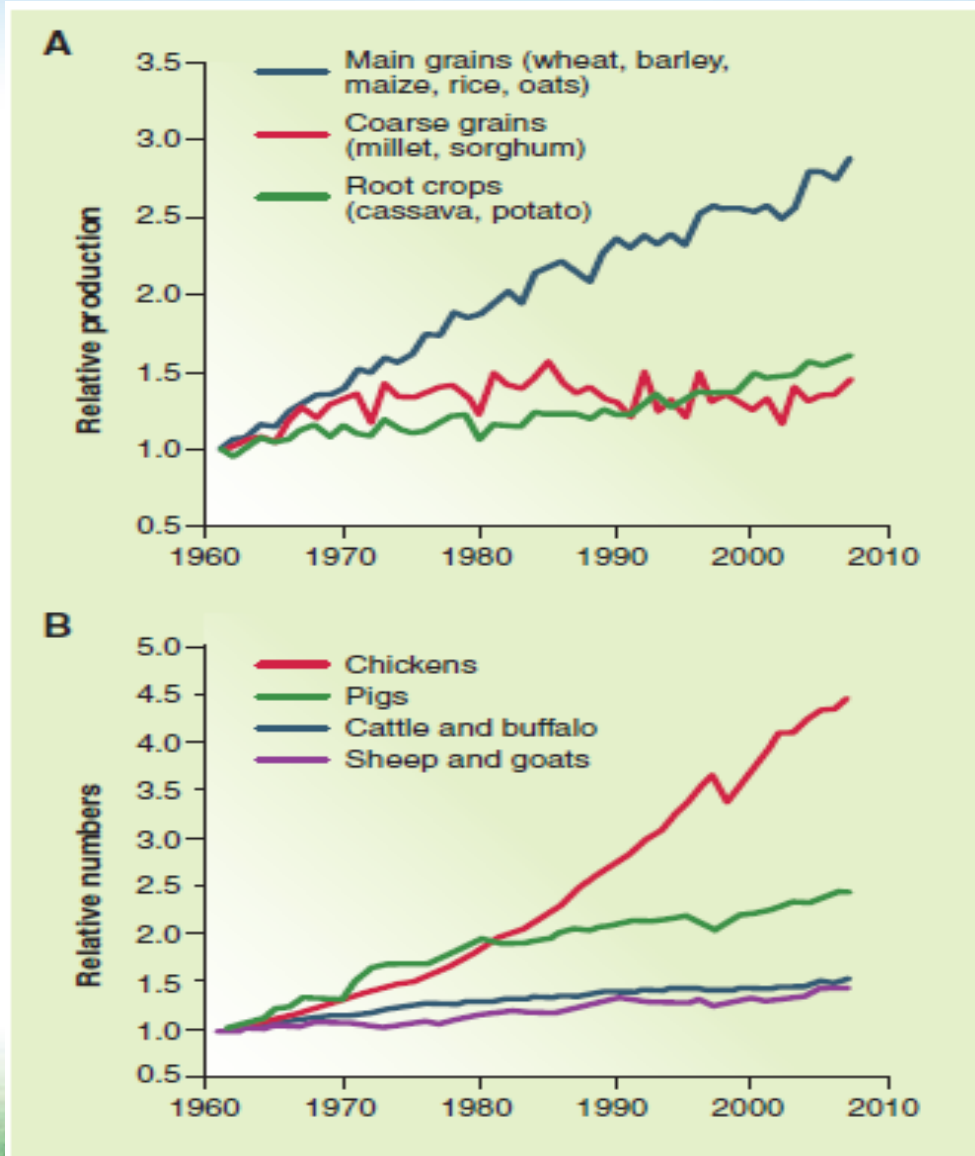
(Sources: FAO, 2015)

Food situation after the trade liberalization under WTO



- Aggravation of uneven distribution of food.
- Disruption of food production infra-structure of developing countries.
- Strengthen the price decision power of food supplier.
- Control of food market by a few major companies and power countries.

Changes in world crop and livestock productions (Base year 1961)

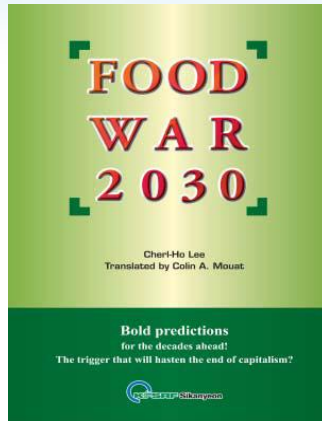


(A) Major crop plants

(B) Major types of livestock.

[Godfray et.al, 2010]

Food War 2030 by Cherl-Ho Lee (Sikanyeon, 2013)



Sikanyeon Publishing
First print: March 8, 2013

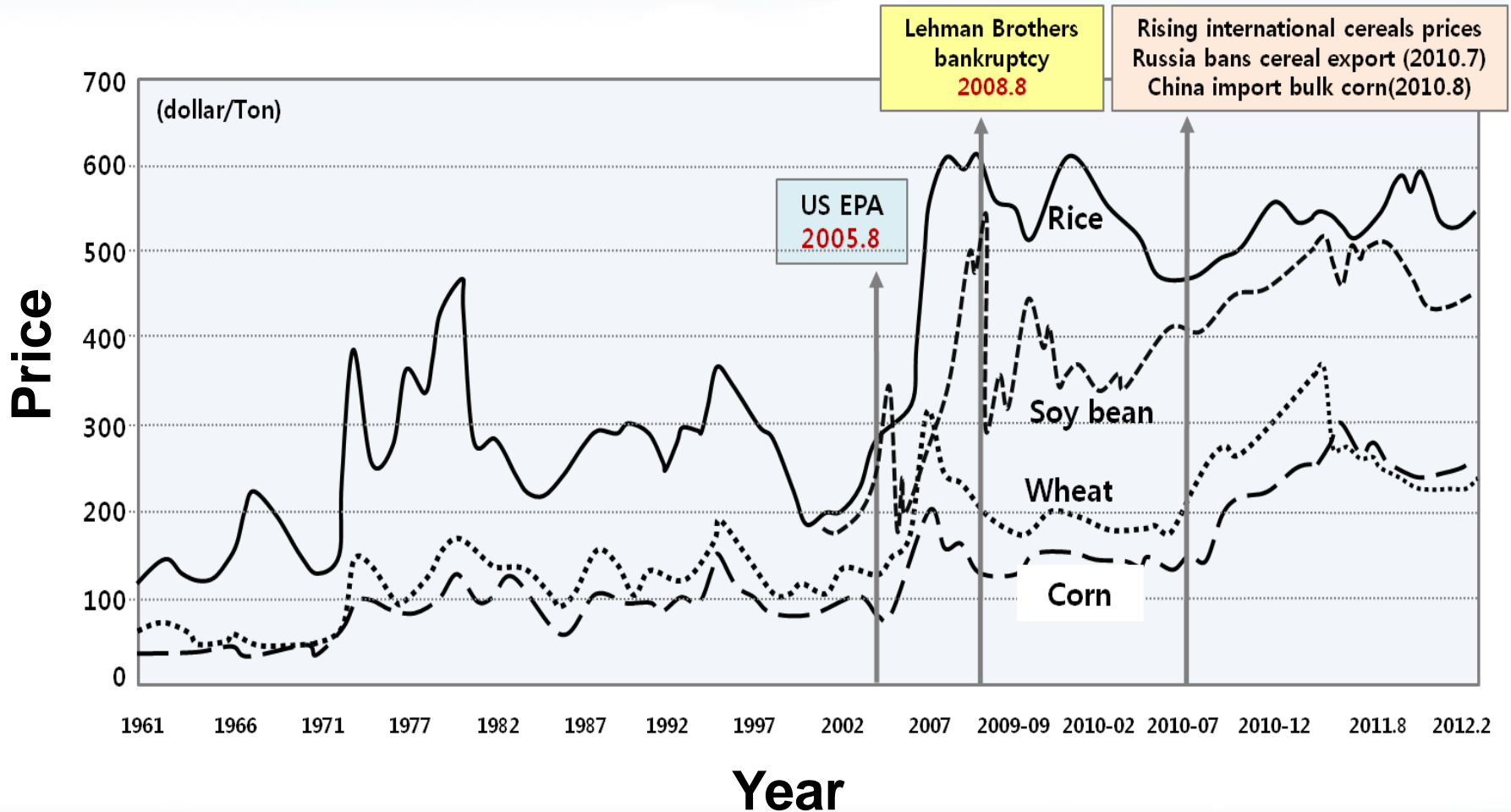


Sikanyeon Publishing
First print: March 20, 2012
2nd print: April 30, 2012

CONTENTS

- I. Girding for Battle
- II. The Mad Cow Frenzy
- III. The Seed Wars
- IV. The Opening Act
- V. The Fat Tax Hearings of 2015
- VI. The Food Wars in 2030
- VII. Tagore's Prophecy

Changes in world grain prices



Factors causing global food crisis



- Global warming and climate change
- Bio-energy production from food grains
- Animal food consumption by China and India
- Conflict on the use of GM foods

Other factors

- Higher oil prices
- High prevalence of livestock diseases by globalization
- Market disturbance by speculation
- Trade restriction by food nationalism



Estimation of grain production change in 2080 by global climate change

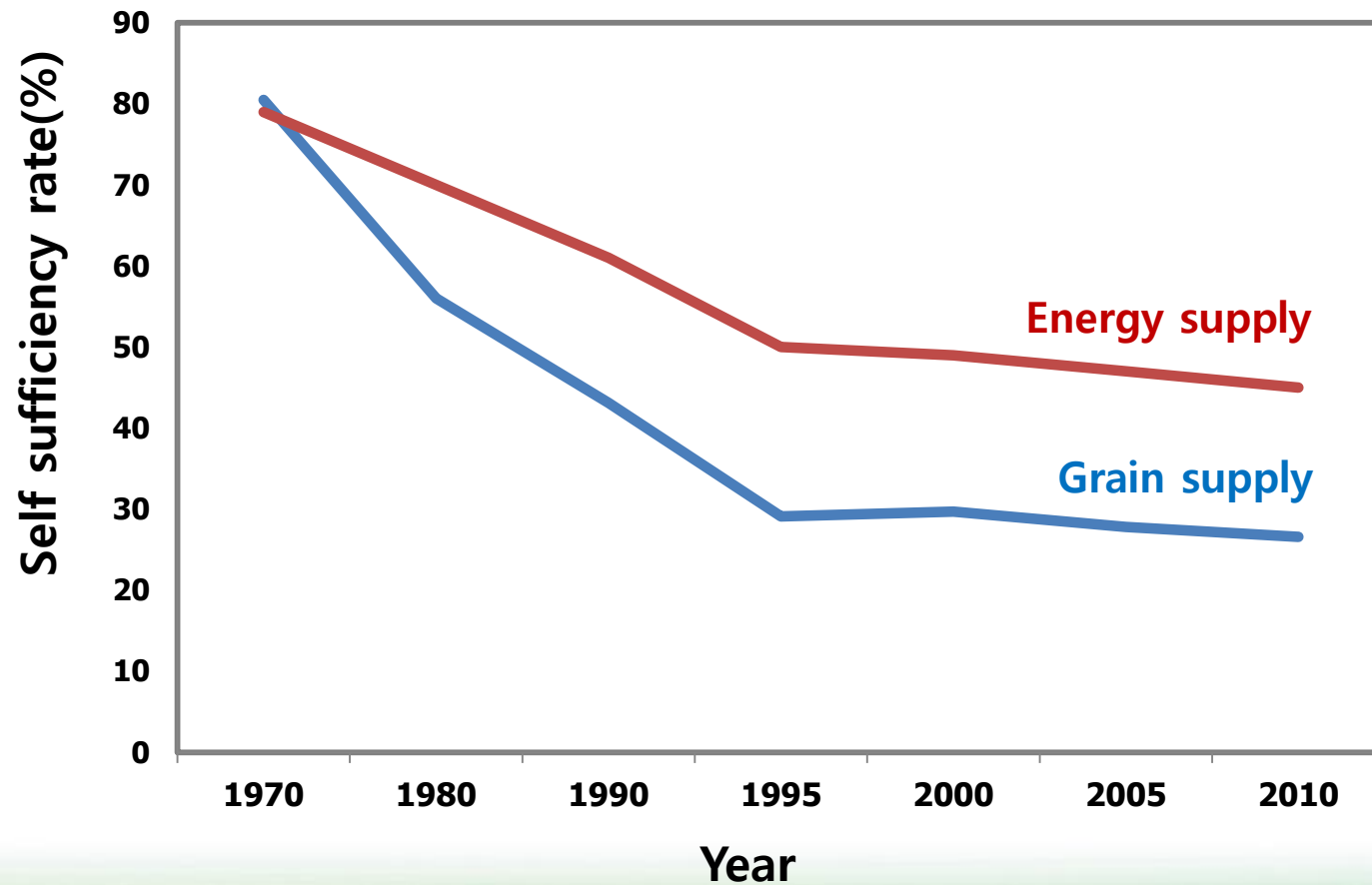
	1990-2080 (% change)
World	-0.6 to -0.9
Developed countries	2.7 to 9.0
Developing countries	-3.3 to -7.2
Southeast Asia	-2.5 to -7.8
South Asia	-18.2 to -22.1
Sub-Saharan Africa	-3.9 to -7.5
Latin America	5.2 to 12.5

Source: Adapted from Tubiello and Fischer 2007.

Food situation in Korea



1. Rapid reduction in food self-sufficiency





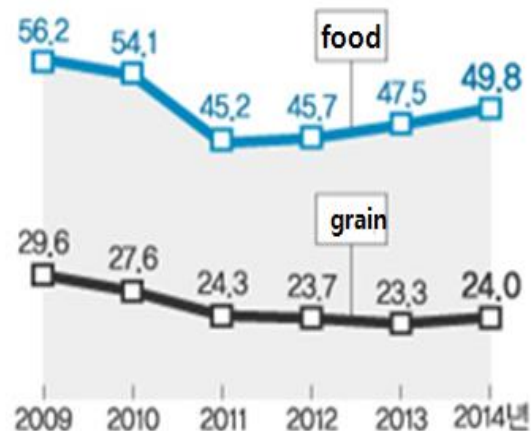
Food security index of Korea marks 74.8 in 2015, which ranks Top 26th in the world.

Food self-sufficiency in Korea was 49.8% in 2014 and Grain self-sufficiency was 24.0%

2015 Food security index [Unit: points, () ; last year]

1(1)	USA	89.0
2(5)	Singapore	88.2
3(7)	Ireland	85.4
4(2)	Austria	85.1
5(3)	Netherlands	85.0
9(15)	Australia	83.8
15(16)	UK	81.6
21(21)	Japan	77.4
26(25)	Korea	74.8
42(42)	China	64.2

Changes of food self-sufficiency and grain self-sufficiency in Korea(%)





2. Reduction of rice consumption

Changes in per caput grain consumption of Korean (Kg/year)

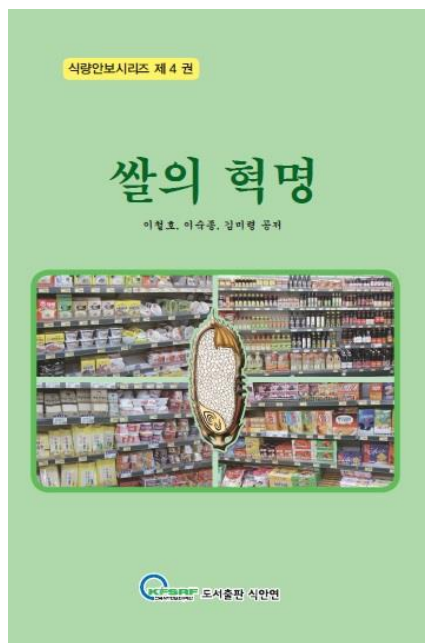
	1970	1980	2014	Import(2014) (10000M/T)	Self-sufficiency (%)
Rice	136	132	65.1	410	95.7
Barley	37	14	1.3	234 ¹⁾	24.8
Wheat	26	29	31.7	377	0.7
Corn	1	3	3.5	1,024	0.8
Soybean	5	8	8.1	128	11.3

Source ; Main Statistics of Food, Agriculture, Forestry and Fisheries(2015)

1) ; Food Balance Sheet(2013)



Rice Revolution (Sikanyeon, 2015)



Creation of rice demand and use

Rice processing industry

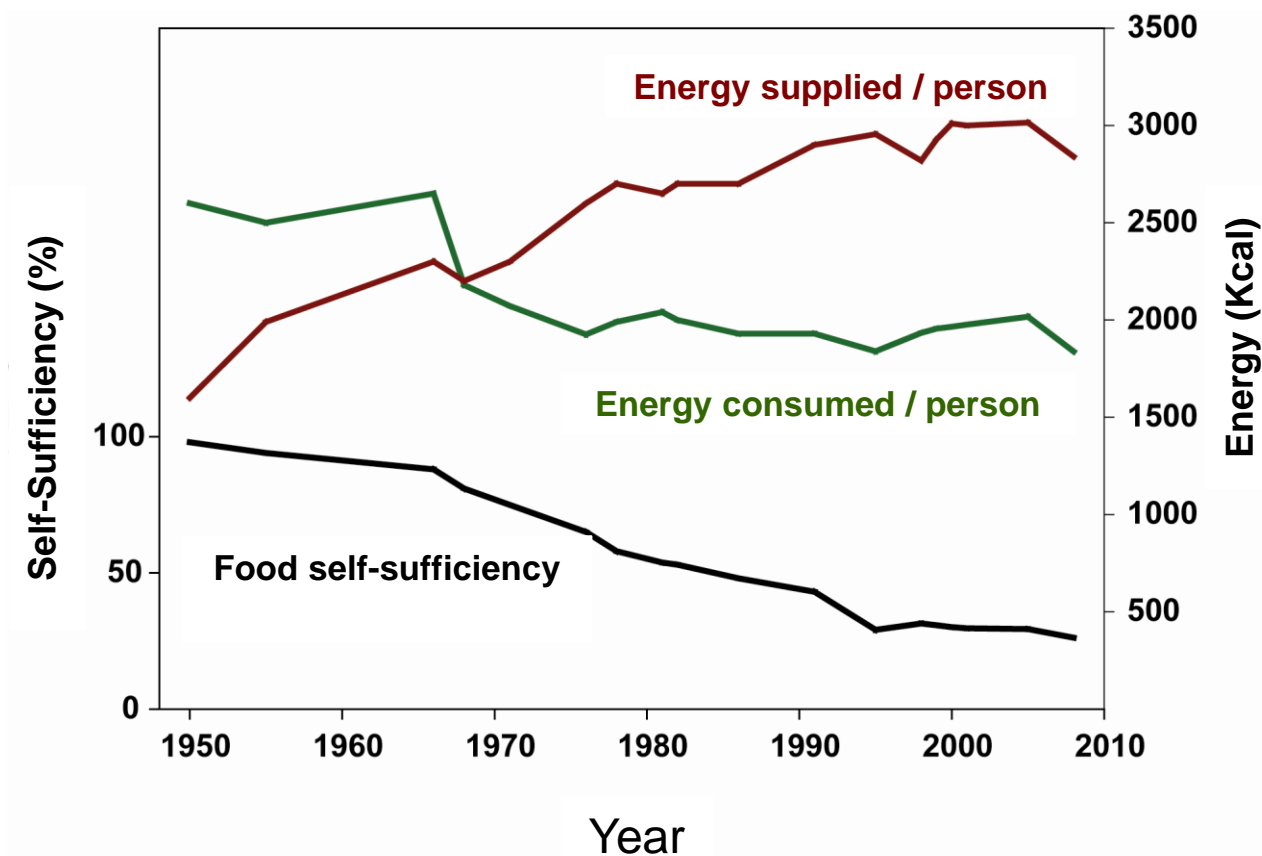
- Instant cooked rice (Hatban)
- Ready-to-eat rice dishes (Cupban)
- Instant rice noodles
- Rice cake, cookies and beverages

Rice as a driver to unification

- 120 million tons rice reserve
- Rice stamp for the low-income group



3. Over-consumption and Food waste

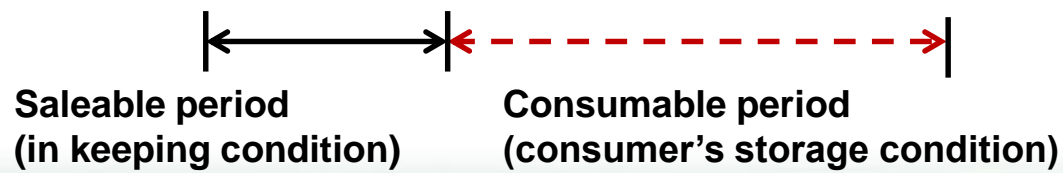
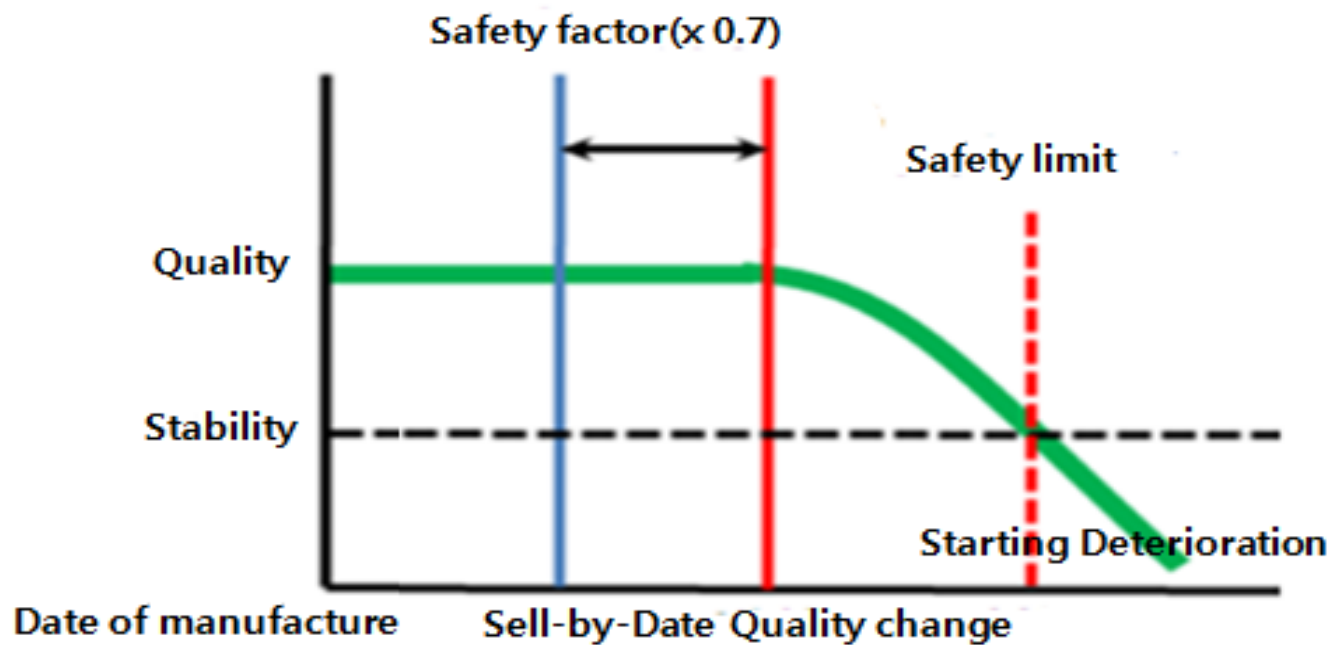


Energy supply – Energy intake = Food loss(waste)

(Lee, 1999)

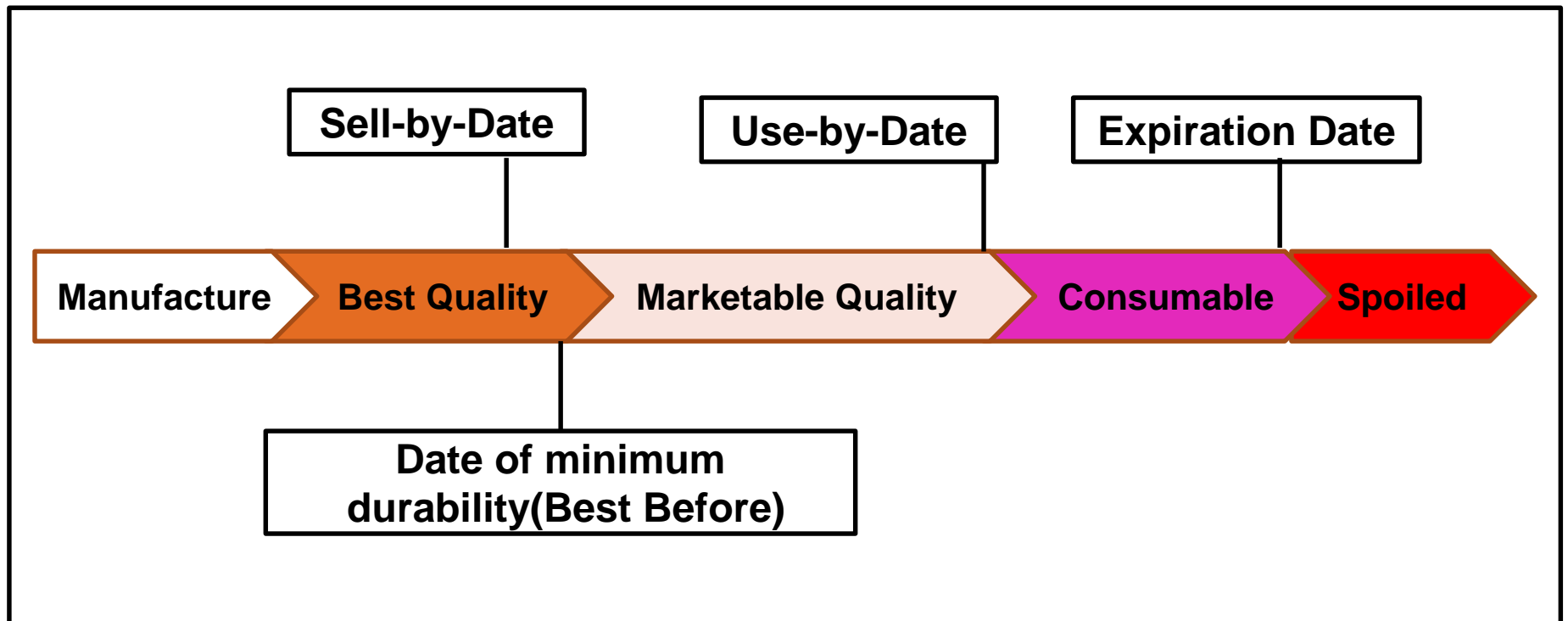


Problem of Sell-by-Date labeling





Labeling of Use-by-Date





Food safety and Food security

- **Two faces of a coin**
- **Mutually colliding and complementing**
Food shortage – No room for food safety
Unsafe – No use a pile of food

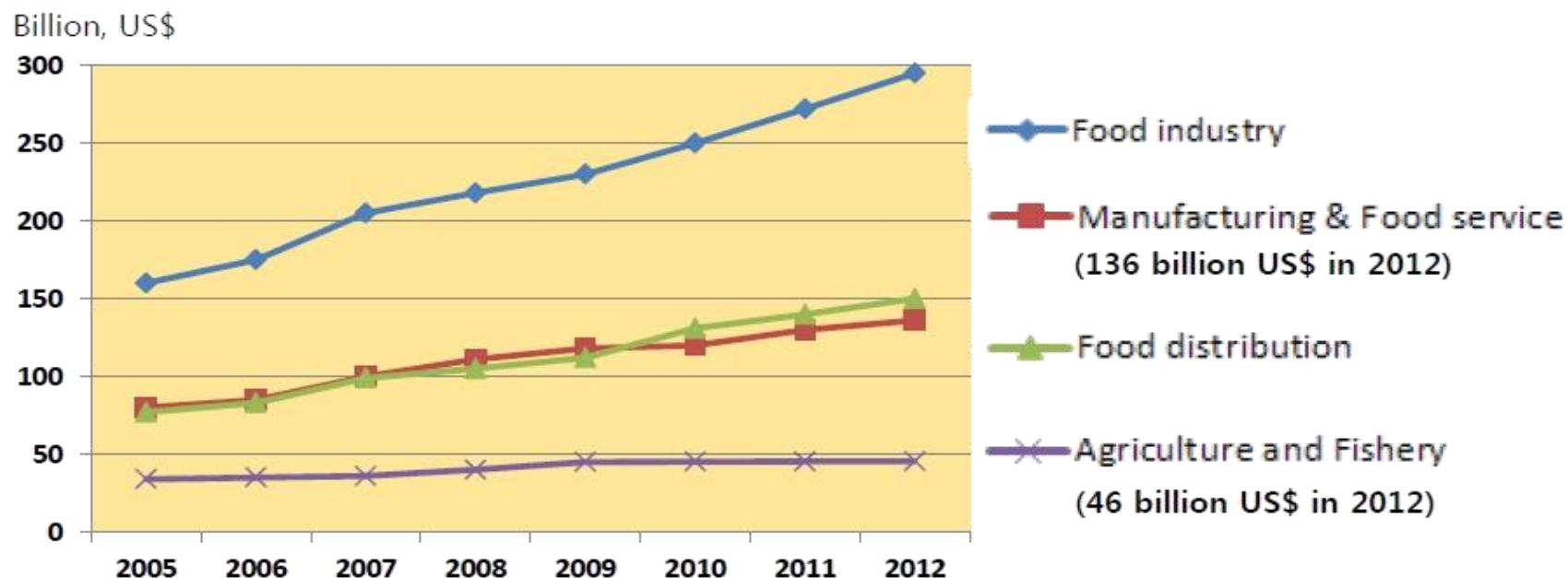
Food safety↑ – **Food Availability** ↓ – **Food price**↑

**Need social consensus to harmonize
food safety and food security**



Current status of Korean food industry

- Food industry is composed of **Manufacturing & Food service** industry, **Food distribution** industry, and **Agriculture & Fishery** industry

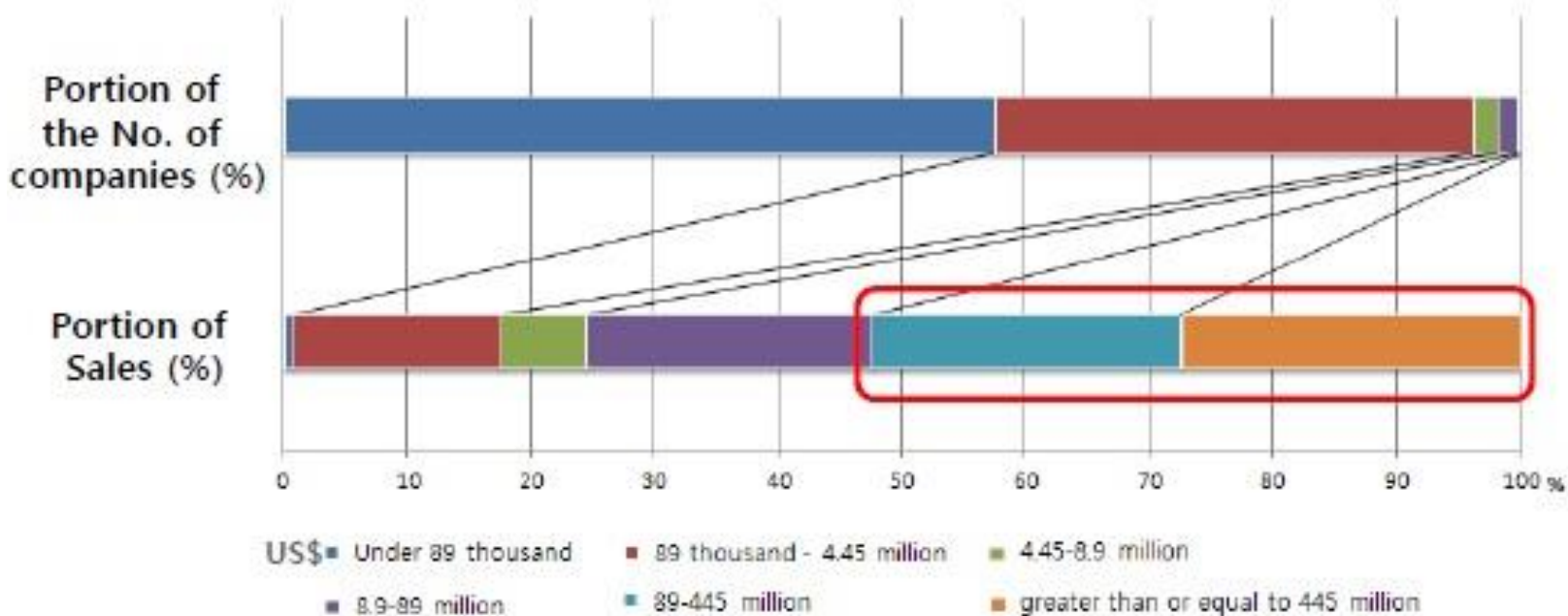


➔ **Scale of Manufacturing & Food service industry** are much bigger than agriculture and fishery industry's

Food manufacturing industry of Korea



- Number of companies vs. sales in S. Korea (2012)




➔ **Companies** with sales of greater than 89 million dollars (0.26%), occupied about **half portion of sales** in the total market

Food trade(import& export)of Korea(2012)



Unit : \$ 1 million, %

Rank	Country	Food imports	Food exports	Food trade	Rank	Country	Food imports	Food exports	Food trade
1	USA	103,533	107,768	211,301	12	Canada	30,470	33,515	63,985
2	Germany	83,030	74,402	157,432	13	Russia	45,564	10,111	55,675
3	France	56,906	67,426	124,332	14	Mexico	19,575	21,435	41,010
4	Netherland	43,858	70,821	114,679	15	Australia	11,427	27,259	38,686
5	UK	58,852	29,569	88,421	16	Thailand	8,155	29,370	37,525
6	China	32,419	52,795	85,214	17	Argentina	1,691	31,436	33,127
7	Italy	46,731	37,776	84,507	18	Poland	13,755	19,115	32,870
8	Japan	73,268	4,485	77,753	19	Denmark	12,462	20,067	32,529
9	Belgium	35,027	40,673	75,700	20	India	5,381	23,850	29,231
10	Sapin	32,964	40,367	73,331	21	Korea	22,640	6,047	28,687
11	Brazil	9,122	58,415	67,537					

 **Serious imbalance** between imports and exports

- Amount of food imports (78.9%) + amount of food exports (21.1%)



Major hurdles to Korean food industry development

- ❖ Protective tariff for agricultural products:
High import duties for food ingredients,
low import duties for manufactured goods.
- ❖ Consumer concern on food irradiation and
GMO, and NGO's demands for labeling.



Protective tariff for Agricultural products





Food ingredients		Processed foods	
Item	Tariff (%)	Item	Tariff(%)
Powered milk	40	Cake/confectionary	8
Almond, nuts	30	Ice cream	8
Peanut oil	30	Margarine	8
Lactose	20	Chocolate	8

(source: Lee C.H. et. al., 2009)

Economic benefit of food irradiation



Value of post-harvest losses of fresh foods in Korea

				
Average production amount(ton/year)	627,221 ^a	382,769 ^b	165,487 ^b	968,074 ^b
Losses (%)	25 ^c	26.7 ^d	20.4 ^d	24.1 ^d
Amount of loss (ton/year)	156,805	102,199	33,759	233,305
Wholesale price (Korean Won/kg) ^e	770	4470	13666	370
Monetary loss(₩)/year (US \$ million)	1,207억 (110)	4,568억 (415)	4,613억 (419)	863억 (78)

a : Post harvest management technology manual, Potato. Lim Hak-Tae (2005)

b : Production amount of seasoning vegetables, Ministry of Agriculture and Forestry (2005)

c : Post harvest management technology manual, Potato. Ministry of Agriculture and Forestry (2005)

d : Postharvest management technology manual, Garlic. Lee Seong-Koo (2005).

e : Korea Agro-Fisheries Trade Corporation (02/05/2011 price, medium-quality)





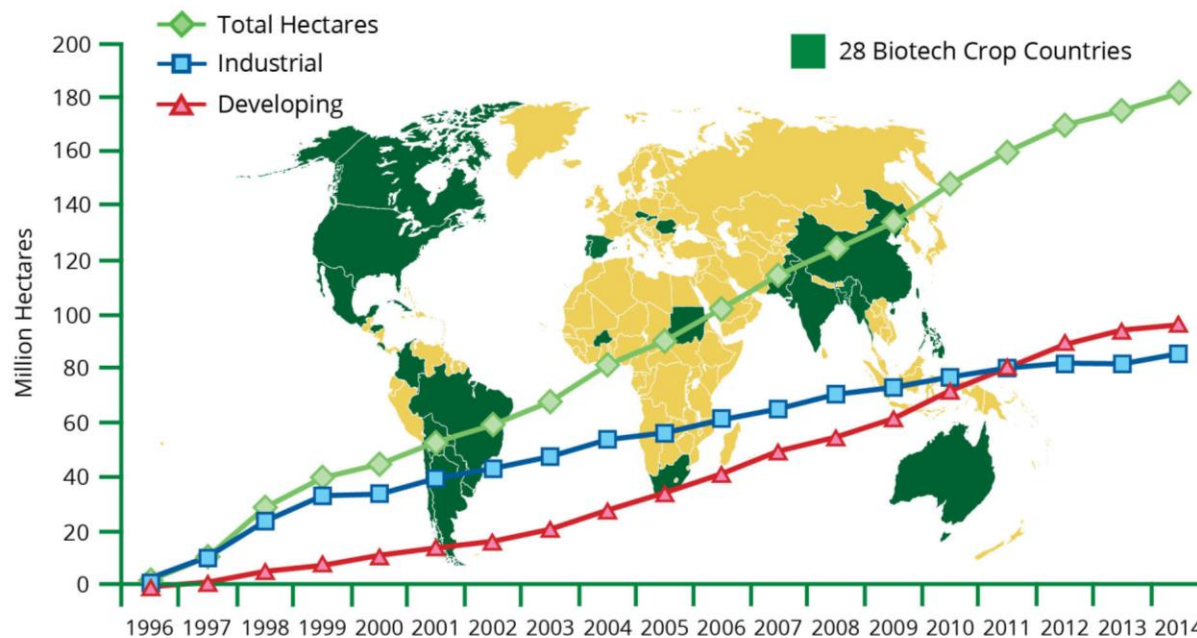
Estimated cost of saving by irradiation in Korea

	Million US\$
Post-harvest losses of vegetables (IR permitted)	1,022
Value of processed foods wasted by expiring sell-by date (IR permitted processed foods)	82
Value of processed foods wasted by expiring sell-by date (IR-applied processed meats, fishes)	175
Cost from prevention of bacterial food poisoning by irradiation	163
Total possible saving by irradiation in Korea	1,442



Trends in global GMO use

GLOBAL AREA OF BIOTECH CROPS
Million Hectares (1996-2014)



A record 18 million farmers, in 28 countries, planted 181.5 million hectares (448 million acres) in 2014, a sustained increase of 3 to 4% or 6.3 million hectares (~16 million acres) over 2013.

Source: Clive James, 2014.

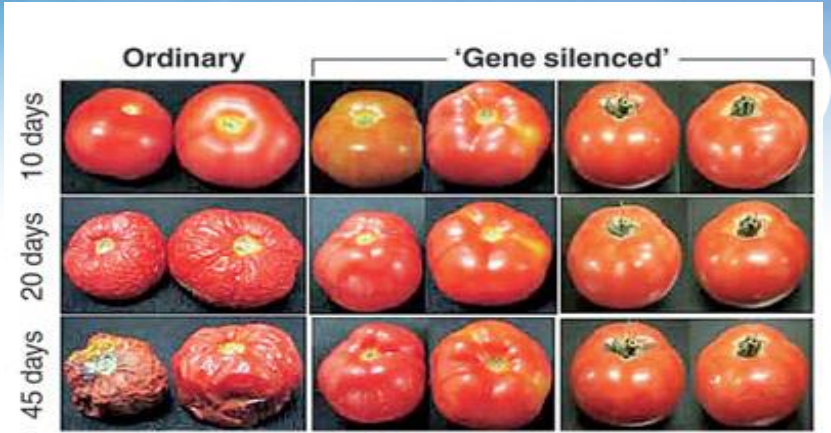


Image shows three sets of tomatoes. The ordinary control tomatoes (extreme left) soften and shrivel up, while texture of gene-silenced tomatoes remains intact for up to 45 days.

Photo credit: Asis Datta, Subhra Chakraborty, National Institute of Plant Genome Research, New Delhi





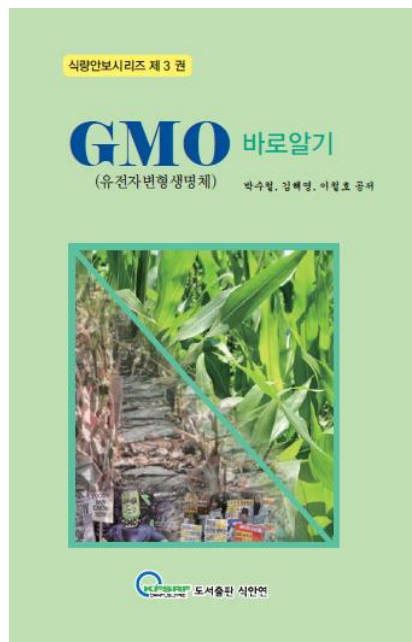
Former anti-GMO activist turns advocate



- ❖ Mark Lynas, UK, visited Seoul, June 3-5, 2013. Lecture on Scientific truth on GMO, June 4, Press Center; Public lecture on Global warming and food security, June 5, Korea University
- ❖ Lecture to Oxford Farming Conference, 3 January, 2013, apologized for his mistake being an anti-GMO activist, contributed to a situation where people are irrationally scared of a technology which will be vital to save millions of lives in the years to come.
- ❖ 29 April, 2013, speech at Cornell University, USA, ‘Time to call out the anti-GMO conspiracy theory’



Knowing Correctly about GMO (Sikanyeon, 2015)



Scientific background of biotechnology

- Breeding
- Molecular breeding

Status of GM crop development

Safety control system of GMO

Trends in global GMO use

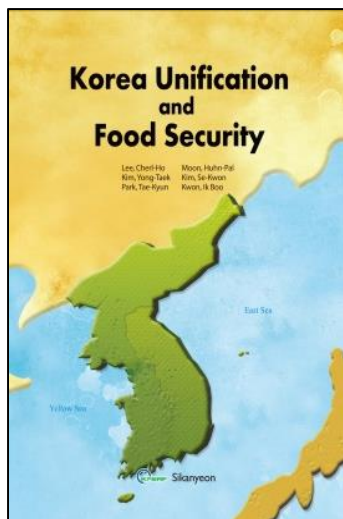
Disputes on GMO safety

Future of GMO and food security

Policy suggestions for GMO Use



Korea Unification and Food Security (Sikanyeon, 2015)



**Analysis of Food and nutritional status of
North and South Korea**

**Estimation of the food demand and
potential production capacity after unification**

**Status of the Food Industry in North and South Korea
and Its Food Security Function**



Published in 2012
By Sikanyeon



Outlook for Food Supply and Demand after Korea Unification

Unit: 1000 tons

	Korean Peninsula					Imports (3)	Food shortage on the Korean Peninsula	
	Food demand		Supply	Food shortage			(1)+(3)	(2)+(3)
	scenario 1	scenario 2		scenario 1 (1)	scenario 2 (2)			
2015	29,022	29,469	28,451	571	1,018	15,721	16,292	16,739
2020	30,523	30,653	29,527	996	1,126	15,874	16,870	17,000
2025	31,873	31,662	30,429	1,444	1,233	15,804	17,248	17,037

Food shortage after unification : 570,000 tons - 1.0 million tons.



Prediction of Korean food industry after unification

(Processed foods) (10,000ton/year)

Food	Production capacity	Production	Operation rate(%)	Demand after unification	Additional production	Operation rate after unification (%)
Ramen	72	35	49	53	17	73
Noodle	190	74	39	111	37	58
Cake	23	11	50	17	5	75
Rice cake	227	109	48	163	54	71
Confectionary	141	51	36	76	25	54
Flour*	308	217	71	325	107	105
Tofu	71	34	47	50	17	71
Soymilk	77	17	23	26	8	34

자료 : 식품유통연감 2011 (가공식품)
*한국제분협회

National Food Self-sufficiency Goal

(Amended in July 10, 2011)

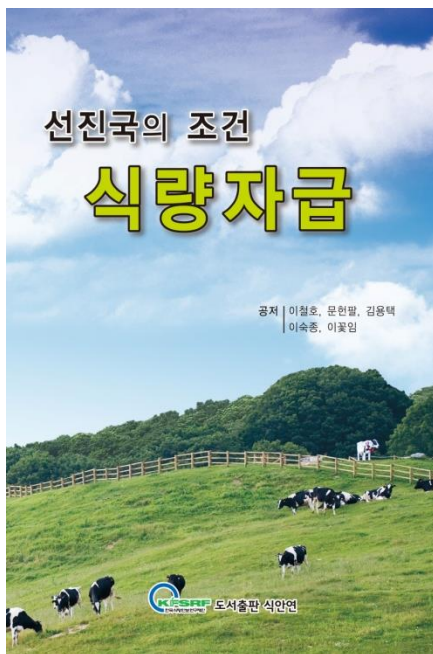


Item	Present	2015 Goal		2030 Goal
		Before	Amended	
Grain Self-Sufficiency	26.7	25.0	30.0	32.0
Grain (food) Self-Sufficiency	54.		57.0	66.0
Grain sovereignty	27.1		55.0	65.0
Staple food Self-Sufficiency	64.6	54.0	70.0	72.0
Energy Self-Sufficiency	50.1	47.0	52.0	55.0
Rice	104.6	90.0	98.0	98.0
Wheat	1.7	1.0	10.0	15.0
Soybean	31.7	42.0	36.3	40.0
Feed	37.5		41.2	44.4
Vegetables	89.3	82.0	86.0	83.0
fruits	81.1	66.0	80.0	78.0
meat	72.0	71.0	71.4	72.1



A Condition for Advanced Country

- Food Self-sufficiency (Sikanyeon, 2014)



- Global food crisis and Korean food security
- Status of rice demand and supply
 - measures to enhance rice consumption in Korea
- Importance of soybean in Korean diet and
 - measures to increase domestic production
- Statue of feed stuff importation and
 - amendment of livestock licensing law
- Food waste problems and counter measures
- National movement for food self-sufficiency



Food Policies Suggested

- 1. Legislation of 1.2 million tons rice saving for sudden unification of Korea.**
 - Storing 600,000 tons of rice annually for 2 years and then releasing it to rice processing industry
 - The cost estimates US\$ 0.48 billion, 11.8% of Foreign Affair/Unification Budget
 - Trust-building process to North Korean People
 - Activation of rice processing industry and rice consumption



Food Policies Suggested

2. Provision for low income people with rice coupon

- Support 10kg rice and rice products/person/month to the low income people (7% of total population in South Korea)
- A basic welfare system like Food Stamp in U.S.A.
- The cost estimates US\$ 0.81 billion, 0.8% of Health and Welfare Budget
- Establishing governance system for implementing the provision
- It facilitates immediate food support to North Korean people when sudden unification occurs.

Food Policies Suggested



3. Rising rice production goal to 4.8 million tons/year

- Keep rice paddy land to the level of 2011, 960,000 ha.
- South Korea will be the major rice producing area after unification

4. Plan to produce soybean for food use in the country

- Korean diet is based mainly on rice and soybean.
- Annual soybean consumption for food amounts 400,000 tons, Self- sufficiency rate 25%.
- Give advantage to those purchasing domestic soybean in TRQ allocation
- North Korea will be the major soybean producing land after unification

Food Policies Suggested



5. Adoption of European style animal husbandry licensing law limiting animal number per farmland

- Policy to increase feedstuff production in Korea
- Feed grain self-sufficiency rate is 2.1%, that of forage 84%
- compulsory to grow forage at farm to a certain level.

6. Cooperation of fishery industries between South and North Korea

- Joint fishing operation in International waters
- Support fishing vessels and materials to North Korea
- Cooperation in aquaculture industry, technology and human resources



Food Policies Suggested

7. Strategic support for food industry to function as a national food security guardian

- Enhancement of competitiveness of food industry in international market
- Support food industry to import and store sufficient amounts of food ingredients
- Plan for transport system of food through major ports in South and North Korea



Food Policies Suggested

8. National movement to enhance food self-sufficiency rate in Korea

- Education of people to prepare for future world food crisis
- Reduction of food loss during harvest, storage, processing and consumption
- Enhance food production capability by R&D and proper policies

아이디


비밀번호

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