

# **The Korean Market for U.S. White Wheat**

**Station Bulletin 661  
February 1984**



**Agricultural Experiment Station  
Oregon State University, Corvallis**

## THE KOREAN MARKET FOR U.S. WHITE WHEAT

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The authors wish to thank Dr. Steve Buccola and Dr. Jim Cornelius for helpful comments and suggestions. Any remaining errors or omission are, of course, the responsibility of the authors.

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### Abstract

Over the last two decades the Republic of Korea (South Korea) has become an increasingly important market for U.S. wheat. It is now a particularly important market for white wheat produced in the Pacific Northwest. This bulletin tracks the history of U.S.-Korean trade in wheat. It describes the Korean wheat import system and presents an economic analysis of Korean demand for white wheat. Finally, this bulletin speculates about the prospects for other countries to follow a market development similar to that followed by Korea.

## THE KOREAN MARKET FOR U.S. WHITE WHEAT

### Introduction

The last few decades have witnessed a major increase in U.S. wheat exports. Between 1960-61 and 1980-82, total U.S. wheat exports increased by nearly 30 million metric tons (from 19.6mmt to 48.4mmt). This increase was driven by a general growth in world wheat trade activity, which in turn resulted from excess demand increases in centrally planned (CPEs) and newly industrialized developing economies (NIDEs).

The Republic of Korea (South Korea, henceforth referred to simply as Korea) has been a major growth market for the United States. The Korean market has been, and is, significant to the Pacific Northwest for at least two reasons. First, with the exception of 1971-72, the United States has held at least a 95 percent share of the Korean wheat export market. And Korea has consistently ranked among our leading wheat customers. In 1980-81, only four countries purchased more U.S. wheat than Korea. Further, a large portion of this wheat is moved through PNW ports. Second, a large share of Korea's wheat imports is white wheat from the U.S. Pacific Northwest. Over the last decade, Korea has purchased an average of 23 percent of the white wheat exports from the PNW (or about 21 percent of the region's production). Korea ranks second only to Japan as a PNW white wheat importer. Thus, the growth in the Korean market has had significant economic impacts on the PNW's agricultural economy.

The purpose of this bulletin is to 1) describe the recent history of U.S.-Korean wheat trade, 2) describe the Korean wheat importing system,

3) analyze the economic and noneconomic factors which have resulted in white wheat trade growth, 4) assess future potential for U.S. wheat exports to Korea, and 5) generalize from the Korean case, to the extent possible, about market potential in other NIDEs.

The remainder of this bulletin is divided into four sections. The next (second) section describes the changing patterns of U.S.-Korean wheat trade over the last 20 years and major factors which have influenced these changes are discussed. The third section describes and explains the role of the Korean organizations directly involved in wheat importing. The fourth section summarizes the findings of three studies which attempted to statistically analyze Korean wheat market behavior. The final section presents some general observations about the potential for U.S. wheat exports in Korea and other Pacific Rim markets.

#### U.S. — Korean Wheat Trade — 1963-83

As suggested previously, the United States has dominated the wheat import market in Korea. Between 1963-64 and 1981-82, U.S. wheat exports to Korea increased nearly threefold, from about 0.7mmt to more than 2mmt (Table 1). A number of factors simultaneously contributed to the trade growth. Among these factors were:

- 1) Population Growth — During the 1960s and early 1970s, Korea's population grew at an average annual rate of 2.3 percent. While the growth rate has slowed in recent years (1.9 percent for the 1970-79 period), the increased population level has contributed to an expanded need for food and food imports.<sup>1/</sup>

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<sup>1/</sup> Population growth rates from World Book Atlas, 1978 and 1981, Korea's population in mid-1980 was estimated to be 38.7 million.

- 2) Income Growth — During the 1960s and 1970s the Korean economy was one of the world's fastest growing. Over this period, Korea's total Gross National Product (GNP) increased at an average annual rate of 10.2 percent; per capita GNP grew at an impressive 8.0 percent. From 1975 through 1981, annual per capita GNP increased from \$574 (U.S.) to \$1,630 (U.S.).<sup>2/</sup> Correspondingly, per capita food consumption grew steadily as illustrated in Table 1. Note, for example, that per capita consumption of wheat nearly tripled in two decades. Likewise, meat consumption increased dramatically. This tended to pull other grains, such as barley, away from food use to feed use.
- 3) Urbanization — Korea's economic growth was fueled by rapid urban industrialization. Thus, population moved further away from domestic food supplies, making imports more competitive. In 1960, nearly two-thirds of Korea's population lived on farms. Today, less than a third of the people are farmers.
- 4) Decline in Domestic Wheat Production — Korean domestic wheat production declined throughout the 1960s and 1970s, in part because of resource shifts toward rice production. This combination of rapid growth in demand and falling domestic production resulted in import expansion. Korea became significantly less self-sufficient in wheat over the 1961-81 period (Table 2). Growth in Korean wheat imports resulted in growth in U.S. wheat exports to Korea. Table 3 demonstrates that as Korea's wheat imports increased, the United States maintained a dominant market share.

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<sup>2/</sup> Choi, Yang-Boo (1981) p. 116.

Table 1. Annual Per Capita Food Consumption Trends for Selected Food Products and Per Capita GNP 1960-79.

Year	Rice	Wheat	Maize	Vegetables	Meats	Milk	Eggs	Seafood	Per Capita/GNP in U.S. Dollars
(in kilograms)									
1960	112.7	11.3	.8	N/A	3.5	N/A	1.8	N/A	94.90
1965	121.8	13.8	.9	420.0	3.5	.3	1.7	17.8	105.00
1970	136.4	26.1	1.1	59.9	5.2	1.4	4.1	17.3	242.00
1975	123.6	29.5	2.4	62.5	6.4	4.6	4.5	29.9	573.00
1976	120.1	30.2	2.9	68.2	6.8	5.5	4.7	29.8	765.00
1977	126.4	30.3	3.3	62.5	8.1	7.0	5.3	29.5	965.00
1978	134.7	30.5	2.8	104.0	10.1	8.8	5.6	25.9	1,279.00
1979	135.6	30.6	2.9	122.5	11.4	9.9	6.1	25.9	1,624.00

Source: Korea Rural Economics Institute (KREI) Food Balance Sheets, 1978 and 1979, and Kim and Joo (1982).

Table 2. Korean Wheat Production, Utilization and the Self-Sufficiency Ratio, Selected Years.

Year	Production in thousand Metric Tons	Utilization (all uses) in Thousand Metric Tons	Self-Supporting Ratio in Percent <sup>i/</sup>
1961	280	616	45.1
1966	315	774	40.9
1971	322	1,954	16.5
1974	136	1,554	8.8
1976	82	1,819	4.5
1978	36	1,691	2.1
1980	42	1,922	4.8

<sup>i/</sup> The self-sufficiency ratio is the share of total domestic utilization that is domestically produced;  $SSR = \frac{\text{Domestic Production}}{\text{Total Utilization}}$ .



Table 3. Korean Imports of Wheat, Total and From the United States 1963-81.

Year	Total Imports in Thousand Metric Tons	Imports from U.S in Thousand Metric Tons	U.S. Share (Percent)
1963-64	760	704	.93
1964-65	525	525	1.00
1965-66	568	568	.98
1966-67	817	816	.99
1967-68	955	954	.99
1968-69	1,514	1,504	.99
1969-70	1,141	1,098	.96
1970-71	1,711	1,684	.98
1971-72	2,118	1,754	.83
1972-73	1,663	1,621	.99
1973-74	1,596	1,588	.99
1974-75	1,733	1,733	1.00
1975-76	1,495	1,476	.99
1976-77	2,060	1,984	.96
1977-78	1,786	1,717	.96
1978-79	1,702	1,671	.98
1979-80	1,814	1,791	.99
1980-81	2,067	2,055	.99

Source: Gonarsyah, Isang, "An Econometric Analysis of the U.S.-Japan-Korean Market for U.S. White Wheat." Ph.D. Dissertation, Oregon State University, 1983.

There are several reasons for U.S. dominance of the Korean wheat market. First, the long term military-diplomatic alliance between the United States and Korea has given rise to a strong economic linkage. It is often argued that loyalty to the United States as a wheat supplier is part of Korea's payment for our continued military presence in Korea.<sup>3/</sup>

Second, the U.S. has made major efforts to develop the Korean wheat market. Throughout the 1950s and 1960s, Korea was a leading recipient of U.S.-aided grain exports under Public Law 480. Figure 1 shows the relationship between Korea's commercial wheat imports and aided U.S. sales to Korea between 1963 and 1981. Note that not until 1972 did commercial sales exceed aided sales. As P.L. 480 assistance declined, other forms of export support, such as favorable credit terms, were made available to Korea.<sup>4/</sup>

Also, wheat interests in the United States, lead by Western Wheat Associates, (now U.S. Wheat Associates) undertook market development programs for white wheat aimed at Korea. These programs focused primarily on the development of consumer tastes for white wheat products. Introduction of udon noodles as a substitute for rice provided an important area of demand growth for white wheat exports. Today more than 40 percent of imported white wheat goes into udon noodles. Table 4 shows the increase in white wheat's share of total U.S. wheat exports to Korea over nearly two decades. It is likely that some portion of this gain can be attributed to promotion.

<sup>3/</sup> About 40,000 members of the U.S. Armed Forces are stationed in Korea.

<sup>4/</sup> P.L. 480 stipulates that authorized programs can only be made available to low income countries. As Korea has moved into the middle income group of countries (World Bank designation) it has ceased to qualify for aid under this program. Korea is now a fully commercial importer of wheat.

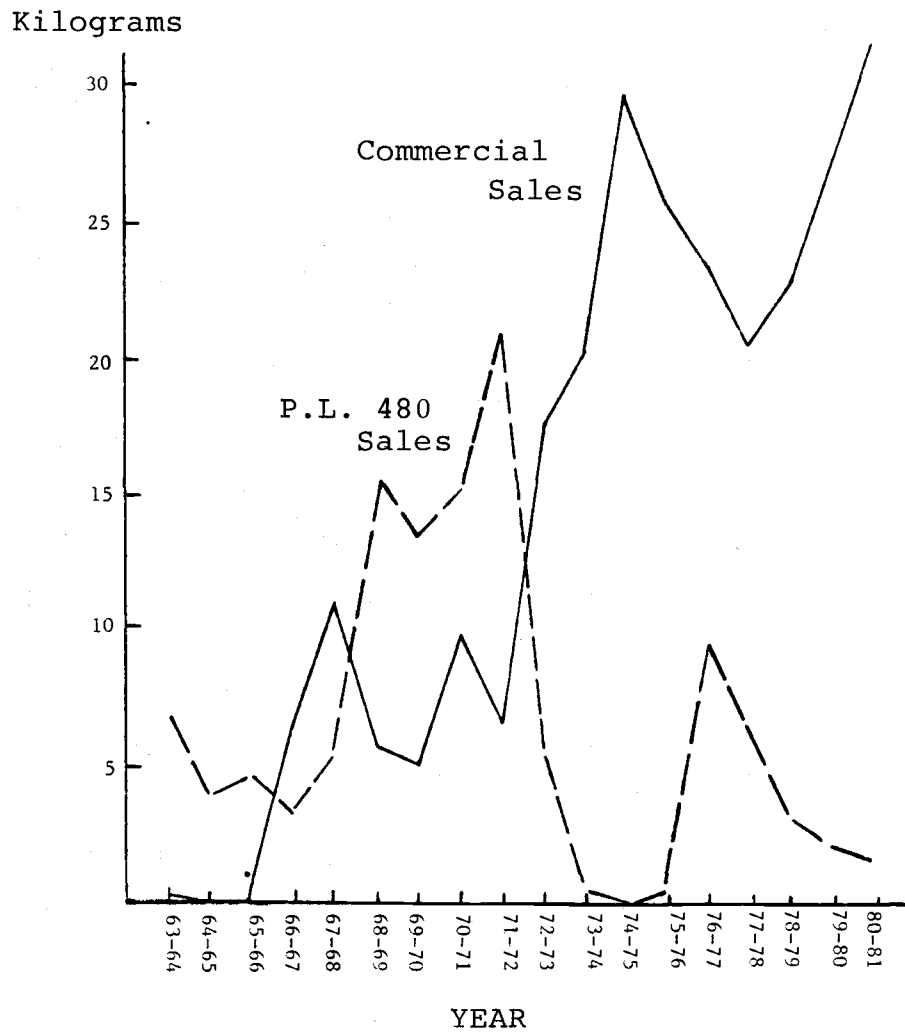


Figure 1. Per Capita Commercial and P.L. 480 Sales of U.S. White Wheat to Korea, 1963-64 Through 1980-81.

Source: International Monetary Fund (39), and Oregon Department of Agriculture (69).

Table 4. U.S. White Wheat Exports and Share of Total U.S. Wheat to Korea, Share of Total Wheat Exports Exported Through the Pacific Northwest and White Wheat Share of Total Pacific Northwest Shipped Wheat, 1963-1981.

Year	White Wheat Exports	White Wheat Share Total U.S. Wheat Exports	Share of Total Wheat Exports Shipped from PNW	White Wheat Share of all Shipped from PNW
	1,000 metric tons	%	%	%
1963-64	180.68	25.7	53.2	44.7
1964-65	111.23	21.2	43.9	48.3
1965-66	134.50	23.7	34.8	68.0
1966-67	293.66	36.0	50.9	70.7
1967-68	514.62	53.9	68.2	79.1
1968-69	663.41	44.1	60.9	72.0
1969-70	586.39	53.4	80.5	63.8
1970-71	823.65	48.9	67.3	71.5
1971-72	925.47	52.8	50.3	86.9
1972-73	793.17	48.9	74.7	65.0
1973-74	717.10	45.2	94.2	47.7
1974-75	1,028.99	59.4	93.5	63.5
1975-76	930.26	63.0	98.9	61.5
1976-77	1,206.98	60.8	95.0	61.7
1977-78	1,134.54	66.1	96.5	65.8
1978-79	974.83	58.3	95.0	60.3
1979-80	1,097.90	61.3	99.0	60.5
1980-81	1,298.75	63.2	96.5	65.1

## THE KOREAN WHEAT IMPORTING SYSTEM

All Korean wheat imports are handled by the Korean Flour Mills Industrial Association (KOFMIA). KOFMIA is a non-profit, government sanctioned organization which represents Korea's 13 million companies. The Foreign Trade Transaction Act and the Food Grain Control Act provide the legal framework for KOFMIA to operate.

Annual Korean wheat import levels are set by the Korean government. The Economic Planning Board (EPB), in conjunction with the Ministry of Agriculture and Fisheries (MAF), determines the desired level of imports. This determination reflects both economic and political considerations.

Once the year's wheat import levels are established, KOFMIA takes the responsibility for the actual purchase from an exporter, chartering international transportation, arranging for handling at a Korean port elevator, and delivery to the individual mill.

As suggested previously, the United States provides virtually all of Korea's wheat imports. In the past, KOFMIA purchased U.S. wheat through one of the major international grain trading firms (Cargill, Centennial, Bunge, or Louis Dreyfus). Recently, however, KOFMIA has shifted a substantial share of its business to the Japanese general trading companies (Marubeni, Mitsubishi, Mitsui, Toshoku, Sumitomo). Officials at KOFMIA suggest that the Japanese firms appear more concerned about grain quality and are more responsive to importer concerns than are the major grain exporters. Also, the Japanese firms, as a result of substantial investment in U.S. handling facilities and very diversified operations, have become increasingly price competitive.

Not surprisingly, there appears to be a strong preference by KOFMIA for transporting wheat on Korean flag vessels. When Korean vessels are not

available, long term charters of other flag vessels are arranged. This provides KOFMIA with considerable control over transportation.

Wheat shipments to Korea enter through one of the two major ports, Pusan or Inchon. Private elevator companies provide ship off-landings, storage, handling (occasionally bagging) and truck out-loading services. These companies, however, do not hold title to the wheat, which remains with KOFMIA until final delivery.

Korea has three port elevator firms: Daehan Bulk Terminal Company and Korea Silo Company at Inchon, and Woo Sung Industries at Pusan. All three port elevators are modern, mechanized facilities with capacity to handle large in-bound shipments (up to 50,000 deadweight tons). The Pusan elevator, which handles grain imports (including wheat, corn, sorghum and soybeans) for the southern part of the country, has a storage capacity of 83,000 metric tons or more than 3 million bushels. The two Inchon elevators combine to handle grain imports for the northern part of Korea. They have a combined storage capacity of 330,000 metric tons or more than 12 million bushels.

It is important to note that although wheat importing is in the hands of private firms, the Korean government plays an important role. Beyond setting import levels, the government grants exclusive import authority to KOFMIA and carries the price risk. However, the system is in the process of becoming more open. Soon individual milling firms will be permitted to act as their own import agents. It is also anticipated that the elevator companies may be permitted to enter grain trading as well.

One possible outcome of more open grain trading by the Koreans is that the U.S. may face the loss of some Korean business to other exporting countries if more speculative purchasing results in greater

price consciousness. Australia and Canada are already positioning themselves to penetrate the Korean market. And, while Korean government policy will continue to be an important factor on wheat import decisions, there is some evidence that diversification in wheat import supplies may become a policy objective as well.

At least one factor will serve to continue to provide the United States with an advantage in the Korean market, however. The Korean system of grain grades and standards is virtually identical to the U.S. system. Thus, internal pricing in Korea is perfectly compatible with export pricing for U.S. wheat.

The 13 Korean milling firms have a combined capacity of 55,029 barrels of flour per day (the equivalent of 2.8 million metric tons of wheat per year). Korean millers operate at about 66 percent of capacity.<sup>5/</sup> Thus, milling capacity is not a constraint in expanding Korean wheat utilization.

The U.S. serves as the principal market for Korean manufactured output. Korea has pursued economic development based on labor intensive manufacturing. Korean products such as textiles, shoes, and electronics have found markets in the United States. As a consequence, a relatively efficient trading system has developed between the two countries. Also, the long-term relationships between U.S. and Korean traders have produced fairly standardized contractual procedures which reduce financing problems and facilitate title transfer.

Finally, Koreans rely heavily on personal associations in their business dealings. The long history of U.S.-Korean trade has served to create such relationships. The Koreans are intimately acquainted with the style of U.S. business and the primary actors in the U.S. trading system.

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<sup>5/</sup> See KOFMIA, Flour Milling Industry in Korea, Seoul, 1983.

## EMPIRICAL ANALYSIS OF WORLD WHEAT MARKETS

A number of studies has attempted statistical assessments of international wheat markets. These studies fall into three groups. One group makes estimates for all wheat (all classes of wheat) on an aggregate (world) market basis. Among these are works by Hutchinson, Naive, and Tsu (1970); Schmitz and Bawden (1973); Konandreas, Bushnell, and Green (1978); and Grennes, Johnson, and Thursby (1977). Each of these provides very useful insights into the behavior of wheat markets. However, the studies tend not to provide a focus on the markets for individual classes of wheat or on markets for all wheat in country-specific markets.

A second group of studies provides analysis of specific markets for wheat. Among these are: Abbott (1976); Gallagher, Bredahl, and Lancaster (February 1979); Gallagher, Bredahl, and Lancaster (May 1979); and Green-shields (1977). These studies provide useful information with respect to the characteristics of import demand for wheat in major markets.

However, in devising marketing strategies, the focus is often on demand for specific classes of wheat in specific markets. Thus, class and market-specific analysis is frequently needed. The present section reports findings of three studies falling into this group. Wagenblast (1981), MacDonald (1982), and Gonarsyah (1983) provide an integrated examination of market demand for whole wheat in the Korean market. The purpose here is not to present a comprehensive explanation of the theoretic models or methodological approaches utilized in the analyses. The reader interested in such detail is directed toward the specific references. Rather, the section will briefly summarize the findings and present a synthesized statistical picture of the Korean white wheat market.



When pursuing statistical analysis of the present type, a number of difficulties must be confronted. First, in designing a model of economic behavior, the challenge is to present a meaningful abstraction of reality. To do so, a decision as to which factors (variables) to include implicitly results in the exclusion of other important factors. Thus, a certain degree of error cannot be avoided.

Second, statistical analysis of economic behavior is sensitive to quality of available data. Even when analyzing the domestic (U.S.) market, data constraints must be confronted. For developing country markets, data availability and quality are particularly worrisome. Korean data are quite good by international standards, but problems of data quality and consistency still exist. This, interpretation of research results must be approached with caution.

Finally, relatively modest variations in underlying assumptions can frequently have substantial impacts on statistical estimation. For example, several approaches to the inclusion of currency exchange rates in demand estimations are available. The way in which other variables influence demand may be affected by the approach selected. As a result, two analysts may arrive at different conclusions using the same data.

Still, having recognized frailties inherent in this type of analysis, a reasonable consistent picture of the Korean market for white wheat emerges from the three integrated studies.

#### The Effect of Wheat Price Change on Korean Wheat Imports

Various estimates revealed a somewhat different Korean wheat import response to changes in wheat prices, but the general finding is that Korean import volume shows little price sensitivity (price adjusted for

inflation and currency exchange rates) from 1963 to 1982. Earlier estimates by Martin, Gonarsyah, Knowles, and Oliveira found that for a one percent change in wheat price, Korean consumption changes in the opposite direction by about 0.30 percent. More elaborate models by Wagenblast and Gonarsyah, which accounted for the effect of rice price variation on wheat consumption, failed to detect a significant consumption response to white wheat price.

The lack of responsiveness to price change may result, in part, from the fact that wheat prices showed relatively little price variation over much of the study period. Between 1963 and 1972, the average year-to-year variation in price was about 17 percent. During this period, Korea relied heavily on P.L. 480-assisted wheat imports from the United States (Figure 1). This assistance largely neutralized the impact of world price variation on recipient nations.

In addition, Korea has used wheat imports primarily to fill needs created by a shortfall in rice availability, particularly in high-growth urban areas. Both rice consumption and wheat imports are influenced by Korean government policy. Such policies may partially override price considerations in determining wheat import levels.

All this is not to suggest that price will not affect future wheat trade with Korea. The Korean government and Korean wheat importers have shown an inclination toward diversifying their purchases among other exporters and they will likely become more price sensitive in the process.

#### The Effect of Income Changes on Wheat Imports

Both the Wagenblast and Gonarsyah studies of white wheat demand in Korea revealed income to be a significant determinant of wheat import demand.

Each found wheat imports to be positively correlated with growth in per capita income. Wagneblast's estimate of demand found that a one percent increase in per capita income results in a 3.2 percent increase in demand. Gonarsyah's simultaneous equation model estimated a positive demand response of about 1.66 percent for each one percent increase in per capita income. This finding suggests that as per capita income increases, Koreans more than proportionately increase their consumption of white wheat.<sup>6/</sup>

Two observations lend credence to the finding of a relatively high, positive income response for white wheat products, and for white wheat itself. First, it is generally assumed that as incomes rise in developing countries, such as Korea, consumers move toward improved and more diversified diets. Table 1 illustrates the correspondence between rising per capita GNP and rising per capita consumption of wheat.

Second, Korean industrial growth stimulated and, in turn, was stimulated by rapid urbanization. The resulting decline in farm labor negatively influences Korean farm production. Also, with a larger portion of population living in a few large cities, the logistics of food importation greatly improved. Thus, income growth through industrialization appears to have increased demand for white wheat in several ways.

The finding with respect to income responsiveness is consistent with the previous discussion regarding price responsiveness. That is, as their incomes grow consumers tend to become less sensitive to small absolute variations in price.

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<sup>6/</sup> Or more accurately, it suggests the income growth gives rise to an increase in white wheat products, since the demand for white wheat is actually derived from the demand for processed white wheat products.

### The Relationships Between Other Food Grains and Wheat Imports

Both Wagenblast and Gonarsyah found rice and wheat to be closely related in the Korean food demand system. Gonarsyah's analysis suggests that increased availability of rice has a significant impact on the quantity of wheat imported. A one percent change in Korean rice supply tends to induce an opposite change in white wheat imports between 1.75 to 1.98 percent.

At least two factors explain this negative relationship between white wheat imports and rice production. First, although Koreans have Westernized their diets somewhat, rice continues to be their staple. For many traditional Koreans, wheat products are thought to be nutritionally inferior to rice. Thus, wheat products are consumed only when rice is relatively scarce. When the price of rice rises relative to wheat, wheat is consumed as a diet extender. Note from Table 1 that while per capita wheat consumption has grown over the last two decades, per capita rice consumption has increased as well.

Second, food self-sufficiency, particularly rice self-sufficiency, is an important political objective of the Korean government. Thus, import restrictions are tightened when the rice crop is good and liberalized when rice supplies decline. Through this mechanism, Korea has been generally able to attain rice self-sufficiency over the last decade while wheat self-sufficiency has declined.

Gonarsyah found that demand for white wheat imports and Korean barley supply was positively related. Specifically, a one percent increase in barley supply is correlated with an increase of between 1.4 and 1.9 percent increase in white wheat imports. Rather than directly related in a causal

sense, however, it is likely that both wheat importation and barley production are tied to changes in rice supply. Koreans use domestic barley and imported wheat to fill rice deficits. Barley is mixed with rice when rice supplies are tight. Since Korean barley production is quite small, it is not possible to replace a rice shortfall exclusively with barley.

#### The Impact of P.L. 480 on Korean White Wheat Imports

Assistance under P.L. 480 appears to have enhanced total consumption of white wheat in Korea. Both Wagenblast and Gonarsyah found the P.L. 480 wheat replaced commercial wheat sales in Korea in the short term. That is, if Korea received increased wheat aid in any year, it was required to purchase less wheat through commercial channels.

However, over the full period of the study there is evidence to suggest the availability of P.L. 480 grain in early periods served to strengthen later commercial sales. Figure 1 illustrates that as Korea has passed from P.L. 480 eligibility, it has become a consistent commercial buyer of white wheat. Thus, P.L. 480 may well have served as an important market development tool during the early phase of Korean economic growth.

It is important to note as well that in the 1950s and early 1960s, P.L. 480 aid was focused on Korea to serve diplomatic and security objectives as well as for market promotion purposes. It is impossible to specifically measure the role that U.S. food aid played in enhancing Korean economic and political stability. Still, it is reasonable to assume it had a positive influence. And this stability has enhanced demand, increasing income growth.

### The Effects of Currency Exchange Rates on Wheat Imports

Precisely measuring the effect of currency exchange rate variations on wheat trade is a difficult task. In general, an increase in the value of the U.S. dollar relative to other currencies, raises the importers' price (in their currency); a decrease in the dollar's value lowers the price to importers. However, for commodity-specific bilateral trade relations the exchange effects can be confusing.

One method of including the currency exchange in an import demand analysis is to examine the exchange rate independent of price (Fletcher, Just, and Schmitz). Martin, Gonarsyah, Knowles, and Oliveira, in a preliminary study, used this approach and found exchange rate movements to significantly impact Korean white wheat demand. In their analysis, a one percent change in the Korean won to U.S. dollar exchange rate correlated with 0.15 percent change in white wheat imports.

The more theoretically defensible approach of including exchange rates in demand analysis is to adjust prices for exchange rate variation, since the principal impacts are on prices as perceived by the importer. Wagenblast utilized this method. However, since he found no significant price response in Korean white wheat imports, the effect of exchange rates could not be specifically assessed.

Exchange rates and foreign exchange accumulation may influence wheat imports most profoundly through Korean trade policy. As noted earlier, Korea has been on a rapid industrialization course for the last two decades. Much of this industrial growth has relied on imported petroleum. As petroleum prices and consumption have risen, ever-increasing volumes of foreign exchange

have been devoted to petroleum imports. Between 1964 and 1980, the value of Korean petroleum imports rose 248-fold, from \$12.5 million (U.S.) to \$3.1 billion (U.S.). Thus, Korea has been forced to limit importation of other commodities so as to retain exchange reserves to cover the costs of petroleum. Changes in exchange rates directly impact on the purchasing power of exchange reserves.

#### Wheat Imports and Korean Food Self-Sufficiency Policy

Over the last few decades, Korea has become increasingly concerned about food self-sufficiency. The Korean view is expressed by Whang (1979, page 93) who argues that, "The supply of food in broad terms comes from two major sources: (a) domestic production, and (b) imports from abroad, including foreign aid. But the import of food would not be favorable to the country in the long run because of the accumulated burden of foreign exchange and national security considerations. The main emphasis of any policy concerned with food supply must be the maximization of domestic production." (His emphasis.)

MacDonald (1982) undertook an exhaustive economic analysis of Korea's food self-sufficiency programs from 1965 to 1978. He found a marked shift in policy during the 1970s. Where generally free trade and industrial growth were emphasized in the 1960s, agricultural development and rural revitalization received greater attention in the 1970s.

As MacDonald points out, several factors contributed to this policy shift. First, of course, is the obvious desire to realize maximum food self-sufficiency driven by security considerations. In many ways, Korea sees itself as an island in a potentially hostile sea. With traditional enemies to the north and west, and with an acrimonious relationship with

Japan, its eastern neighbor, Korea feels a strong need to be able to "go it alone", if necessary.

Second, there seems to be a desire to maintain, to the extent possible the traditional Korean diet. Many Koreans view Westernization of their diet as undesirable on both cultural and nutritional grounds.

Third, there is a growing feeling in Korea that Korean farmers have carried more than a proportionate share of the cost of industrial growth. Incomes and income growth for Korean farmers have lagged well behind those of the urban dweller over the past two decades. There now appears to be a commitment by the government to improve the lot of farmers and rural residents in Korea. One mechanism, now being utilized, is trade protectionism aimed at raising prices received by domestic farmers.

MacDonald found that the sum of consumers' losses and government expenditures from food self-sufficiency programs exceeded the producers' gains. From a strictly efficiency perspective, their new policy regime has been excessively costly. However, the political returns from the effort apparently justify continuation. Thus, it is likely that Korea will continue its drive toward food self-sufficiency through import controls and domestic production promotion. The result will be to hold wheat imports below the level that would occur in a free trade environment.

#### IMPLICATIONS FOR FUTURE WHEAT EXPORTS TO KOREAN AND OTHER PACIFIC RIM COUNTRIES<sup>7/</sup>

The composite findings of the studies as reported here suggest that Korea will remain a leading customer for U.S. white wheat but, it is unlikely that exports to Korea will grow at the rate experienced in the last

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<sup>7/</sup> This section's statistical information is from the World Bank, World Atlas of Gross National Product and Population Growth Rates, 1981 and World Economic and Social Indicators 1979 and 1980; and from the U.N. Food and Agriculture Organization, Trade Yearbook 1980.



two decades. Continued income growth in Korea will tend to drive import demand growth for wheat.

However, food self-reliance, if not self-sufficiency, will almost certainly continue to be a Korean policy objective. The Korean government will pursue policies aimed at increasing domestic supplies of food staples while imposing some level of import restriction. Further, it is possible that Korea will simultaneously begin diversifying its imports. That is, the dominant position of the United States in Korean wheat market could begin to erode. Given the current high value of the U.S. dollar vis-a-vis other currencies, wheat from other sources will appear cheaper to Korea.

It should be noted however, that wheat (and other grain) exports from the United States to Korea likely will move increasingly through Pacific Northwest ports. Korean import officials prefer receiving PNW shipments over shipments from other U.S. ports. The transit time from the PNW is five to seven days shorter than from the Gulf ports (the other major U.S. originations). This means that financing costs are lower for PNW shipments. The minimizing of transit time tends to reduce the chance of quality deterioration in grain.

Australia is making an effort to capture a share of the world white wheat market now held exclusively by the United States. Australian white wheat is being promoted through such mechanisms as consessionary credit terms. Korea also may feel that wheat import diversification will reduce its economic reliance on the United States and, thus, leave them less susceptible to unpredictable import interruptions. Thus, even if the value of the dollar decline relative to the won, import diversification will likely be pursued by Korea. It seems prudent then to view Korea as an important future importer of U.S. white wheat, but not a market with

large growth potential.

Reviewing the development in U.S. wheat trade with Korea provides some useful insights with respect to other potential growth markets for U.S. wheat exports. Several Pacific Rim nations appear to be following an economic growth trajectory similar to Korea. Malaysia, The Philippines, Thailand, and Indonesia appear to be nearing a stage in economic development where expansion of wheat imports could occur.

Malaysia is one of the most developed nations in the region (per capita income of about \$1,600 per year) and has experienced a sustained annual growth rate of 5.4 percent in per capita income over the last decade. Malaysia does not import wheat since Malaysians have largely maintained a rice based diet. However, with a population growth rate of about 2.3 percent a year, this may be a market with reasonable growth prospects for U.S. white wheat exporters, particularly if continued economic development leads to increased urbanization.

In recent years, The Philippines has been a modest importer of wheat, averaging about 0.7 million metric tons annually. However, it has been a net exporter of rice. Nonetheless, The Philippines has been experiencing annual population growth of 2.3 percent and per capita income growth at nearly 4 percent per year. Pressure on domestic food supplies could build, resulting in increased imports.

Thailand, while on a growth trajectory (4.4 percent per capita during the last decade) is also one of the region's leading surplus food producers. If continued economic development leads to urbanization, which, in turn leads to Westernization of the Thai diet, white wheat imports to Thailand could grow.

Indonesia is probably the Pacific Rim nation with the largest potential as a growth market for white wheat in coming years. Indonesia is one of the most populous nations in the region (about 150 million). Further, it is experiencing population growth at the rate of about 2.3 percent annually. During the 1970s, per capita income grew at a brisk rate of about 4.6 percent per year. Though income growth has slowed of late, Indonesia possesses substantial petroleum reserves which serve as a basis for future economic development.

Moreover, Indonesian agriculture, while making progress, has been unable to keep pace with the growth in population. Thus, it appears that Indonesia will be forced to rely heavily on food imports.

Indonesia faces a huge external debt which will likely absorb a major share of any future income gains. This will dampen some of the growth in import demand for wheat.

In the near term, shortages in foreign exchange and tight international credit may limit the participation of these countries, particularly the Philippines and Indonesia, in world wheat markets. And, each country has declared self-sufficiency to be a high national priority. Still, if each follows approximately the development course of Korea, they hold potential for growth in U.S. white wheat exports.

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