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**Changing Food Consumption Patterns**  
**in**  
**The Republic of Korea**

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## ABSTRACT

Industrialization and urbanization in South Korea have led to higher wages, thus increasing the quantity and quality of food demanded. Population growth and rising per capita food demand have resulted in declining self-sufficiency in agricultural commodities. Imports, especially rice, will rise substantially to meet the domestic need. Further demand for all food is estimated to rise from \$1.4 billion in 1964 to \$2.2 billion in 1971, with an average growth rate of 6.5 percent per year.

Key words: South Korea food consumption, urbanization, food requirements, population growth, import requirements, projections.

## PREFACE

This report summarizes the major findings of the comprehensive study, of An Analysis of Food Consumption in the Republic of Korea, prepared under contract for the U.S. Department of Agriculture by a team of economists at the Yonsei University, Seoul, Korea, in 1969, under the direction of Doctors Ki Hyuk Pak and Kee Chun Han. The main objectives of the study were to obtain an accurate assessment of food consumption by select food groups as well as by individual food items, and to develop reliable indications of future needs. Findings in this study are those of the contractor and do not necessarily coincide with views of the Department.

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## SUMMARY

Korean demand for agricultural products will continue to exceed domestic production through 1971. Population growth, urbanization, and industrialization will not only increase the domestic production-demand gap but also alter greatly its composition. Requirements will have to be met by increasing imports and, perhaps, by promoting the use of substitute foods for those in scarce supply.

As the value and volume of aggregate food demand increase, the patterns of food consumption are changing due to urbanization and industrial development. The percentage of urban population is expected to increase from 29.3 percent in 1961 to 39.3 percent in 1971. Although total population is also increasing, it is doing so at a declining rate--from 2.8 percent in 1964 to 2.4 percent in 1968 and this rate may decline further to 2.3 percent by 1971.

Total food expenditures are expected to rise from \$1.4 billion in 1964 to \$2.2 billion by 1971, with an average annual growth rate of 6.5 percent. <sup>1/</sup> Urban food expenditures are growing at a rate of 9.1 percent annually, compared with a 4.8 percent annual rate for rural areas.

The future demand for grains shows the same patterns as that for all foods. The demand for rice in urban areas has the relatively high growth rate of 7.9 percent, while in rural areas it is 4.7 percent. Of the nongrain foods, the highest growth rate (14.6 percent per year) is for eggs and milk. Fruits rank next, with demand increasing more than 11 percent annually. Processed foods are the only food category for which the annual growth rate of demand is higher in rural areas (11.1 percent) than in urban (7.8 percent). Demand for meats and fish, vegetables, seaweed, and condiments is also growing rapidly.

As a result of the upgrading of the South Korean diet, there will be a growing opportunity for farm commodity exporters, including the United States.

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<sup>1/</sup> Dollar values have been computed by converting Korean won at the 1964 exchange rate of 255 won to 1 U.S. dollar.

CHANGING FOOD CONSUMPTION PATTERNS  
IN  
THE REPUBLIC OF KOREA

by

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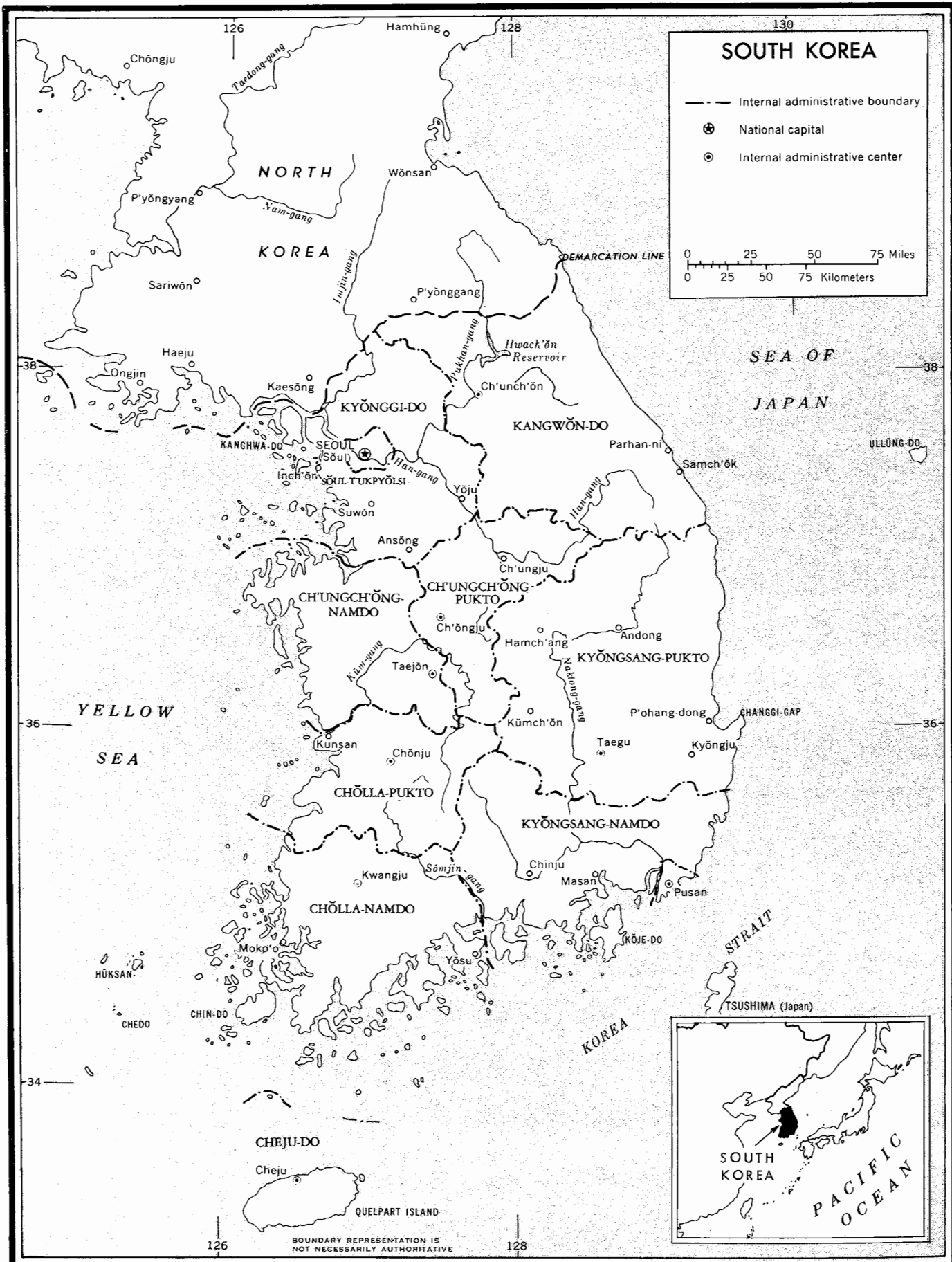
INTRODUCTION

This report presents the main findings of a recent study of the changing food consumption patterns in South Korea which have resulted from industrial development and population shifts from rural to urban areas. The study prepared by the Yonsei University, Seoul, Korea, also projects the demand for major farm commodities in South Korea during 1968-71.

Methodology

Utilizing cross-sectional data from 1964 food consumption surveys, three sets of projection parameters were derived: unit consumer scale coefficients for Korean households (consumers of all ages evaluated in terms of an adult consumer unit having a relative scale coefficient of 1); average adult consumption of select foods in Korean households; and total expenditure elasticities for foods. To project the demand for foods, two additional parameters dealing with population and per capita private consumption expenditures were also derived. Based on the above parameters, food expenditures for select foods and food groups were estimated for 1964-67 and projected to 1968 and 1971. These expenditures were converted to quantities by utilizing Seoul consumer retail prices (1964), adjusted for differential price levels in other parts of the country. The resulting household demand was matched with food balance sheet data to derive balance sheets for select foods for 1964-71.

Separate analyses and projections of production and trade were not carried out. Production and trade data for 1964-67 as well as for the projected output of major grains for 1968-71 were obtained from Korean Government sources. Trade was treated as a residual for the projected years.



The study was limited by the lack of annual cross-sectional and time series data which precluded an adequate analysis of price changes. Also, no allowances were provided for governmental and institutional interference in the market place.

### Physical Background

Geography determines the patterns of South Korea's agriculture. The mountainous topography is the main limiting factor for agricultural development, leaving only approximately 22 percent of the land area for cultivation. About 68 percent of the country is mountainous, and another 10 percent committed for other uses. There are no extensive lowlands, but there are areas of relatively fertile land bordering the main rivers and along the western and southern coasts. The climate is continental with cold dry winters and hot humid summers. Although the average rainfall is 40-55 inches, most comes with the monsoon.

### Population

Population growth is an important factor determining South Korea's demand for food. In 1961, the total population was about 25 million. It increased to 28 million in 1965, and by 1968 had risen to 31 million. By the end of 1971, the population is expected to be about 33 million. The percentage of urban population to the total is expected to increase from 29.3 percent in 1961 to 39.3 percent in 1971. Population grew at an annual rate of 3.0 percent in 1961, but the rate is expected to decline to 2.2 percent in 1971.

Currently, 60 percent of the population still derives its livelihood from agriculture, however, the dominant trend is growing urbanization caused by greater urban-industrial job opportunities and the limited employment opportunities in rural areas. Younger people are moving to the cities and towns. In 1960, only 26.5 percent of persons 80 years of age and over lived in cities and towns, but about 39 percent of the 25 to 29-age group were in urban areas. Since then, rapid urbanization has continued and the same urban-rural age imbalance prevails.

### Food Expenditures by Income Group

In Korea, as elsewhere, the level of income is a major determinant of food consumption patterns. As income increases, expenditures on food increase substantially in absolute terms, but they decline in proportion to total expenditures.

Households with yearly incomes exceeding \$750, the highest income group studied, spend \$525 per year on food, approximately 2.8 times more than the \$190 spent yearly on food by the lowest income group, households with incomes of less than \$280. Food accounts for 53.8 percent of the total expenditures in the higher income group, compared with 79.3 percent in the lower. Expenditures on grains were highest (43.1 percent of total expenditures) in

the \$280-\$375 income class. For the yearly income class of more than \$750, the proportion of total expenditures for gains was 30.1 percent.

Rice is the most important grain consumed by all classes of people. The income class of less than \$280 spends about \$55 per year on rice, 60.5 percent of its total expenditures on grain. The income class of more than \$750 spends about \$240 per year on rice, about 82.3 percent of its total expenditures on grain.

Expenditures for all other grains are inversely related to income. The proportion of total grain expenditures spent on barley is 24.4 percent for the income class earning less than \$280 annually, and 8.4 percent for the income class earning more than \$750. For wheat flour, 4.4 percent of total grain expenditures is made by the lower income class, but only 2.6 percent by the higher income class. The lowest income households consume relatively less rice and more barley and other grains because of higher cost of rice.

For the country as a whole, the average expenditure for grains is 57.6 percent of the food budget. Of this value, rice accounts for 74.4 percent, barley and wheat flour 15.5 and 2.9 percent, respectively, and other grains 7.2 percent.

#### FOOD CONSUMPTION

In 1964, total food demand in South Korea exceeded \$1.4 billion. <sup>2/</sup> In 1968, it jumped to an estimated \$1.8 billion and by the end of 1971, total food demand may reach an annual level of about \$2.2 billion, approximately 56 percent above 1964.

Since the urban population is growing faster than the population as a whole, urban demand for food is expected to increase more rapidly than rural demand. Because of its greater purchasing power, the urban population is able to demand more and better food than the rural populace. In urban areas, total food demand was about \$533 million in 1964; it increased to \$764 million in 1968, and is expected to reach \$980 million by 1971--an average annual growth rate of 9.1 percent. In rural areas, total food demand increased from \$822 million in 1964 to \$1.1 billion in 1968. By 1971, total food demand in rural areas may exceed \$1.2 billion with an average annual growth rate of 4.8 percent. The growth rate in food demand in urban areas is twice that in rural areas.

#### Grains

Demand for all grains, especially in urban areas, is expanding. Estimated urban demand rose from \$287 million in 1964 to \$417 million in 1968,

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<sup>2/</sup> As inferred in the section on Methodology, food consumption relates to household demand in terms of constant 1964 prices.



an increase of almost 45 percent. Since the urban population is increasing at a rate of 5.5 percent per year, it is projected that the demand for all grains will increase to \$537 million by 1971, reflecting both population increase and higher per capita grain consumption.

In rural areas, the demand for grain grew from an estimated \$633 million in 1964 to about \$770 million in 1968, an increase of 21 percent. By 1971, rural demand for grains will reach \$870 million, with an average annual growth rate of 4.6 percent.

#### Rice

The urban demand for rice was about \$227 million in 1964 and rose to about \$312 million in 1968, almost 37 percent higher than the 1964 level. It is expected to increase to \$389 million by 1971. The average annual growth rate of rice demand in urban areas is about 7.9 percent, but only 4.7 percent in rural areas. Rural rice demand is expected to rise from \$406.5 million in 1964 to about \$560 million in 1971.

The total demand for rice is projected to rise from \$634 million in 1964 to \$949 million in 1971, an average annual increase of 5.9 percent.

#### Barley

Because barley is considered by the Koreans to be a less desirable grain than rice, its consumption decreases as income increases. The demand for barley has been gradually falling in both rural and urban areas. In urban areas, demand for barley is expected to decline from \$39 million in 1964 to \$38.5 million in 1971. In rural areas, demand for barley is expected to decrease from \$104 million in 1964 to \$98.5 million in 1971.

For the country as a whole, the demand for barley is expected to drop from \$144 million in 1964 to \$137 million in 1971.

#### Wheat Flour

In terms of total expenditure elasticities, wheat flour is considered a quasi-necessity food for rural households but an inferior food for urban households. Wheat flour vermicelli is the principal wheat flour food for low income families, while wheat flour is chiefly used for special cooking, such as baking and frying, in high income families. Large quantities of wheat flour have been distributed as wages in kind on construction projects and for relief of destitute or disaster-stricken people under Title II of P.L. 480; thus, wheat flour has become available to all income classes.

The distribution of wheat flour as wages in kind is not always reported by surveyed households. This practice tends to result in underreporting of both consumption and consumption expenditures, giving a downward bias to the consumption projections. The degree of this bias can not be determined until another household consumption expenditure survey is performed and analyzed.

Rural demand for wheat flour is projected to increase from \$31.6 million in 1964 to almost \$49.5 million in 1971, an average annual growth rate of 6.6 percent. In urban areas, demand for wheat flour is projected to rise from \$6.9 million in 1964 to \$9.9 million in 1971, an average annual growth rate of 5.3 percent.

Total demand for wheat flour in South Korea will increase from \$38.6 million in 1964 to \$59.3 million in 1971.

### Meat and Fish

Demand for meat and fish in South Korea is increasing at an average rate of 6.6 percent per year. In 1964, total demand for meat and fish was about \$181.5 million; it rose to about \$236 million in 1968, and is expected to increase to \$283 million by 1971. The fast-growing urban population shows a high demand for meat and fish, with an average growth rate of 8.1 percent per year. The rural population is increasing its demand for meat and fish at an average annual rate of 4.8 percent.

In South Korea, almost half of the protein requirements are derived from fish. Demand for fish in urban areas is expected to increase from \$41.7 million in 1964 to \$72 million by 1971, while in rural areas in the same period, it is expected to rise from \$35 to \$49 million.

Urban beef demand is expected to increase from \$30.6 million in 1968 to \$38.4 million by 1971. During the same period in rural areas, demand for beef may rise from an estimated \$23 million to \$26.2 million. Pork demand in urban and rural areas follows the same patterns as beef demand. Pork demand in urban areas will increase about 25 percent by 1971, rising from \$22.8 million purchased in 1968. In rural areas, demand for pork by 1971 will increase about 14 percent from the \$24.8 million estimated for 1968. In 1968, urban Koreans, one-third of the total population, consumed \$124.4 million worth of meat and fish, while the rural populace consumed only \$112 million worth. This urban-rural gap will widen by 1971, with urban demand accounting for nearly \$156 million versus the projected rural demand of slightly over \$127 million.

### Eggs and Milk

Of all foods, the demand for eggs and milk is growing most rapidly-- at an average annual rate of 14.6 percent. Demand in urban regions is growing at 15.5 percent per year. Urban regions purchased eggs and milk worth about \$7.4 million in 1964 and \$13.9 in 1968, an increase of almost 88 percent. This demand is expected to rise to about \$20.3 million. Rural demand for eggs and milk is growing at an average growth rate of 7.3 percent per year, only half the urban growth rate. In 1964, demand for eggs and milk in rural regions was about \$1.3 million and in 1968 increased to about \$1.7 million. By 1971, it will rise to \$2.1 million.

South Koreans spend approximately ten times as much on eggs as on milk. Urban Koreans spent about \$6.3 million on eggs in 1964, \$12 million in 1968, and by 1971, they will spend about \$17.4 million. In contrast, urban expenditures for powdered milk were \$600,000 in 1964 and will rise to \$1.6 million in 1971.

Rural South Koreans purchased eggs and milk in the same spending pattern as urban Koreans, but their expenditures were only about one-tenth the urban amount. Rural people purchased \$1.1 million worth of eggs in 1964, \$1.4 million in 1968, and are expected to buy \$1.7 million worth in 1971. Demand for powdered milk was \$100,000 in 1964 and is expected to increase to \$161,000 by 1971.

### Vegetables

Because of the higher standard of living in the towns and cities, demand for vegetables in South Korea has risen from \$137.4 million in 1964 to an estimated \$174 million in 1968, an annual increase of 5.9 percent. By 1971, it may increase to \$205 million. The urban demand rose from \$65.3 million in 1964 to about \$88.1 million in 1968, a sharp increase of 35 percent. By 1971, the urban demand for vegetables may increase to \$109 million, representing an average growth rate of 7.6 percent per year. In rural areas, vegetable demand increased from \$72.1 million in 1964 to \$86.1 million in 1968 and is expected to reach \$96.3 million by 1971. The average growth rate of vegetable demand in rural areas is about 4.2 percent per year.

### Fruits

Fruit consumption in South Korea is increasing at a rate of 11.4 percent per year, a rate second only to that of eggs and milk.

In urban areas, the demand for fruits is rising in excess of 15 percent annually. It grew from \$11 million in 1964 to an estimated \$20 million in 1968, almost doubling in 4 years, and it is expected to increase more rapidly as income and living standards go up. By 1971, the demand may exceed \$29 million, an increase of 164 percent over the 1964 level. In rural areas, demand for fruit grew from \$14.4 million in 1964 to \$20.3 million in 1968, a 40 percent increase. Since fruits are a quasi-necessity in rural areas, the demand is expected to continue to grow and may reach \$24.7 million by 1971, an average growth rate of almost 8 percent per year.

### Condiments

Condiments such as red pepper, garlic, salt, soybean sauce, soybean paste, and sesame oils, are all commonly used in South Korea. The higher the income, the greater the condiment consumption. South Korean demand for condiments is increasing at an average growth rate of 6.4 percent per year. In terms of value, demand increased from about \$93.3 million in 1964 to around \$121 million in 1968, and is expected to exceed \$144 million by 1971.

In urban areas, the demand for condiments is growing at an average growth rate of 8.1 percent per year. In 1964, urban people spent about \$46.5 million for condiments and in 1968, \$64.1 million. Since condiments are a necessity in urban areas, the demand for them may exceed \$80 million by 1971, an increase of about 72 percent over the 1964 level. In rural areas, the demand for condiments is increasing at about half of the rate of urban areas. In 1964, rural areas demanded condiments worth \$46.8 million; this demand rose to an estimated \$56.6 million in 1968. Condiments are a necessity in rural areas and demand is expected to increase to \$64 million by 1971.

### Processed Foods

With the exception of wheat flour, only processed foods are more popular and have a higher growth rate in rural than in urban areas. Processed foods have the highest average growth rate (11.1 percent per year) of all foods demanded in the rural areas.

Rural areas demanded processed foods worth an estimated \$8.7 million in 1964 and \$14 million in 1968. Since processed foods are popular in rural areas, demand may exceed \$18 million by 1971, about twice the 1964 level. In urban areas, demand for processed foods has increased from \$10.2 million in 1964 to \$13.9 million in 1968. By 1971, urban demand may exceed \$17 million.

Demand for processed food in South Korea as a whole will grow from \$18.9 million in 1964 to \$35.3 million by 1971, an average growth rate of 9.4 percent per year.

### Confectionaries

Both in urban and rural areas the demand for confectionaries (biscuits, drops, caramels, cakes) is growing steadily. In urban areas they are a quasi-necessity, but in rural areas they are a luxury.

The demand for confectionaries in urban areas has grown sharply from an estimated \$6.6 million in 1964 to \$10.3 million in 1968. By 1971, demand may reach \$13.8 million, twice the 1964 level, with an average growth rate of 11.1 percent per year.

In rural areas, the demand for confectionaries is growing steadily at about 9 percent per year, a rate in rural areas second only to that of processed food. In 1964, rural areas demanded confectionaries worth about \$4.6 million, this figure rose to about \$6.7 million in 1968. By 1971, the demand may grow to \$8.4 million

Total demand for confectionaries will grow from \$11 million in 1964 to over \$22 million in 1971, an average annual growth rate of 10.3 percent.

## Seaweed

Of the many varieties of seaweed consumed in South Korea, two, Laver and Dulse, are most popular. Seaweed is a very common ingredient in the diets of both urban and rural areas. It is a necessity in rural areas and a quasi-necessity in urban areas. Laver seaweed is more popular in the urban areas, while Dulse is preferred in rural areas.

The demand for seaweed in South Korea is growing at about 8.7 percent per year. Total demand is estimated to increase from \$17 million in 1964 to \$24 million in 1968, and may reach \$30.5 million by 1971.

The biggest increase in demand for seaweed will be in the urban areas, where demand is growing at about 11.5 percent per year, third highest urban growth rate among all commodities. Urban demand is estimated to have increased from \$8.3 million in 1964 to over \$13 million in 1968. By 1971, demand may increase to \$17.7 million, more than twice that of 1964.

In rural areas, the demand for seaweed is believed to have increased from \$8.8 million in 1964 to over \$11 million in 1968. By 1971, it is expected to be about \$13 million, with an average growth rate of 5.6 percent per year.

## FOOD SUPPLY

Since this study is primarily concerned with the analysis of food consumption and the derivation of household demand for the years 1964-71, production and other related data were obtained from official Korean Government sources. <sup>3/</sup> For the projected years 1968-71, trade is treated as a residual. These data were matched with derived household consumption data for grains and potatoes to check the reasonableness of projected consumption in terms of the country's food production and total disappearance and to present a preliminary estimate of future import needs based upon the results of the consumption study. A summary of the production data and related findings is presented in this section.

### Grains

Total grain production was 5.8 million tons in 1964. Because of improved techniques and better agricultural extension services, the report indicates South Korea's grain production may exceed 7.4 million tons by 1971, an increase of 28 percent over the 1964 level. Production in 1969 was about 6.7 million metric tons.

Despite these achievements, South Korea's domestic production of grains has not kept pace with increases in consumption resulting from rising incomes, growing population, and rapid urbanization. While total grain

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<sup>3/</sup> As discussed in this section, consumption is in terms of total demand. All tons refer to metric tons.

production is projected to grow at an annual rate of 3.6 percent, total grain consumption is projected to increase some 6 percent per year. Efforts to increase grain production more rapidly are hampered by the slow development of the agricultural sector compared with industrial expansion and growing urbanization. Over half the total population still makes its living through agriculture.

### Rice

As in many other Far Eastern countries, rice is the major staple food in South Korea and is grown on 56 percent of the cropland. Production was 3.8 million tons (milled) in 1964. By 1971, South Korea may produce about 4.8 million tons of rice--27 percent more than the 1964 level. Production reached 4.1 million tons in 1969.

Total rice consumption in 1964 was 3.6 million tons. As Korean incomes rise, rice consumption increases. It is expected that by 1971 rice consumption may reach 5.5 million tons or 52 percent higher than the 1964 level. Moreover, while rice production is projected to increase at an annual rate of about 3.5 percent, consumption is projected to increase some 6 percent per year, resulting in a rise in per capita consumption from 129.8 kilograms in 1964 to 167.2 kilograms by the end of 1971. As a result, rice consumption in 1971 is expected to exceed production by a substantial margin.

### Barley

Barley is South Korea's second most important crop. In 1964, barley production was about 1.5 million tons. It is expected to approximate 2 million tons by 1971. Production reached 2.1 million tons in 1969. With per capita consumption decreasing from 36.1 kilograms in 1964 to 33.4 kilograms by 1971, domestic barley production is adequate to meet the slight rise in total demand.

### Wheat

Compared with rice and barley, wheat is a relatively small crop in South Korea. Despite limited land resources, wheat production is rising. Although wheat production totaled only about 280,000 tons in 1964, it is expected to exceed 375,000 tons by 1971. It reached a level of 366,000 tons in 1969.

While production is rising about 4.3 percent per year, wheat consumption is rising over 9 percent per year. By 1971, consumption is expected to approximate 1.4 million tons, reflecting an increase in per capita consumption from 26 kilograms in 1964 to 40.7 kilograms in 1971.

## Other Food Grains

Other grains are dried beans (classified as a food grain in Korea) and millet. Before 1965, South Korea produced enough of various kinds of beans and millet to meet domestic demands. Since 1966, production has not kept up with consumption. In 1964, South Korea produced 265,000 tons of other grains. By 1971, production may approach 400,000 tons. In contrast, consumption is expected to increase to 554,000 tons by 1971, resulting in growing import requirements.

## GRAIN IMPORTS

Although basically an analysis and projection of consumption, the study showed residual trade levels for major grains for select years. Since they are unadjusted residuals, the trade projections should be looked upon as indicating trends in trade, not absolute levels.

The residual trends show that Korea's grain imports may approximate 1.9 million tons by 1971, an increase of some 50 percent over the actual 1968 level (1970 imports are now estimated to exceed 2 million tons but are expected to drop in 1971 because of anticipated good food grain crops). Rice shows the greatest quantity advance, more than doubling the 1968 level by 1971. Wheat and dried bean imports are shown to rise moderately, while millet imports are three times greater than their low 1968 level (23,000 tons) by 1971.

The Korean economy is not expected to be in a financial position to sustain the projected import level. The study suggests that a greater portion of the rice import requirements will be eliminated by a governmental campaign to promote the substitution of barley and miscellaneous grains for rice and by the increased importation of wheat.

## CONCLUSIONS

Population growth, industrialization, urbanization, rising incomes, and improved diets are the major factors influencing the food consumption pattern of the Republic of South Korea. The increasing number of South Koreans enjoying a higher standard of living now consume more of most foods. The increase in egg and milk consumption is especially dramatic, followed by fruits, confectionaries, and processed foods. The study did not reveal major shifts in the composition of the diet. However, grains, especially barley, and vegetables are expected to constitute a smaller percentage of consumption by 1971. The percentage share of most other foods will rise. The most significant change was found in the uptrend in rice and fruit consumption.

The study points up the real need for further analysis of food consumption levels and trends in South Korea. Current household consumption expenditure surveys for South Korea lack both adequate coverage and in-depth recording of critical data needed for obtaining the desired quality end

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product in terms of future import requirements. These inadequacies, among others, have most likely resulted in an underestimate of the total food grain demand and import requirements for the early 1970's. However, the study did answer the central question concerning South Korea's food grain requirements: South Korea will continue to be a major importer of total grains during the early 1970's, varying its requirement for the individual grains in response to their relative prices and supply flexibility.