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AND TRADE

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As the world's largest producer, consumer, and buyer of wheat, world wheat trade and prices can pivot significantly on events in China. A wheat economy team was organized by the U.S. Department of Agriculture to travel to China in October, 1989 to study wheat production, consumption, and trade and find out as much as possible about China's future policy on wheat trade. The team conferred with government officials in Beijing from the State Council's Research Center for Rural Development, the Ministry of Agriculture, the Ministry of Commerce, the State Statistical Bureau and CEROIL which is the foreign trade enterprise which controls all imports of wheat into China. The team also traveled to Henan, Jiangsu, and Guangdong Provinces. The authors of this paper served as part of the delegation of a half dozen researchers traveling to China. The other members were from the Economic Research Service, Foreign Agricultural Service, and World Outlook Board of the U.S. Department of Agriculture.

The specific itinerary and summary of interview findings of the team are presented in a separately released report (U.S. Wheat Study Team, "China Trip Report"). This article examines the prospects for future wheat production, consumption, and trade in China and concludes that China is likely to prevail in world markets as a major importer of wheat through the end of this century and into the next if its economy can survive recent political and economic turmoil. It draws on information obtained in China, but the report goes beyond the field study and examines forces and considerations likely to be important in determining the impact of China on the world wheat market through the remaining part of this century.

POPULATION, GRAIN PRODUCTION, CONSUMPTION, AND TRADE PATTERNS

As it contains over one fifth of the human race, almost any discussion of China inevitably starts with the country's population. Notwithstanding much publicity about the official policy of "one child" per family, China's population increased by 122.4 million from 1980 to 1988 (Table 1), the equivalent of the total population of Japan. Sinologists and students of China frequently note that the country contains 22 percent of the world's population, but only possesses 7 percent of the world's

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arable land. This translates into 0.09 hectares of cultivated land per person or about 1/5 th of an acre, a small suburban yard in the U.S.. An article in China Daily ("Science to fight Rural Stagnation", Mar 3, 1990) stated that it is estimated that this area will fall to 0.07 hectare by the end of the Century. The decline in area per capita in cultivation reflects both a growing population base of 14 to 15 million people each year and a declining land base in cultivation as residential/industrial construction and other non agricultural land uses compete for land area.

While the country's leaders proclaim their intention to be self sufficient in grain production, the ratio of population to land has been an important reason China has bought wheat and other grains in world markets. A study published there recently was reported to have concluded that China's population would need to be curtailed back to about 700 million people over the next century to achieve per capita grain output and consumption levels comparable to that of advanced nations today (China Daily, November 14, 1989, p.4). Population would have to fall by over a third of today's level. In the absence of such a reversal in the trend of population change in China, production and/or imports of grain will have to expand substantially to achieve the consumption levels commensurate with advanced countries in the future.

Over the past 40 years since the founding of the Peoples Republic grain output in China has doubled, but as population has grown per capita output has increased only about one fifth. China's official goal is to increase grain output per capita to 400 kg. Even if total grain production were to meet the official target for 2000, which is 500 million metric tons, per capita output would only be 384 kg per capita which would not fulfill targeted per capita consumption. The inconsistency in the two targets is due to the fact that population was originally targeted to stabilize around 1.0 billion, but is already 1.1 billion and now officially projected to reach 1.3 billion people by the end of this century. In fact China has suffered a serious setback in moving towards the goals set for the end of the century by the leadership. Grain production peaked in 1984 at 395.5 kg per capita, but because population increased by over 60 million people over the next four years while grain production stagnated, five years later per capita production fell to only 362 kg (China Daily, November 27, 1989). The country produced a record 407.45 million tons of grain last year. The Agricultural Vice Minister, Chen Yaobang, announced on October 1, that this year's crop will reach 420 million tons, an all time record for the second year in a row, but this is still only 382 kg per capita (Ibid, October 1, 1990).

There has been general consensus that China will continue to need to rely on imports in world grain markets in the future to achieve its food goals. This consensus began to unravel when the Post Mao era reforms released a surge of growth in grain

production in the early eighties, but events in the other half of the decade demonstrated China still needs large imports to fill its food requirements. In a later section the issue of whether China will marshall the foreign exchange to translate this need into actual purchases will be addressed. If China does succeed in finding the hard currency to import grain, there is still the question of how will wheat fit into the picture?

Carter and Zhong in a relatively recent study of China's grain production and trade took the position that the dynamics of China's grain consumption will be driven by expansion of the livestock sector shifting imports from food grain to feed grain imports. Specifically the study predicts that in the next decade the import demand for wheat will decline (Carter, Colin A. and Fu-Ning Zhong, p. 109). On the other hand USDA has predicted that wheat imports will remain strong over the next decade (Economic Research Service, U.S. Department of Agriculture. China Agriculture and Trade Report, 1988.). Halbrendt and Gempesaw have more recently projected Chinese wheat imports for next year in a range of 18.9 to 35.8 million metric tons and conclude imports will increase slowly but consistently into the 1990s (Halbrendt and Gempesaw, p.275). Which prophesy will be fulfilled may hinge among other things on tastes and preferences- if and as incomes grow. However the Chinese people are constantly reminded that they cannot rely chiefly on meat to meet future protein needs. A recent article noted that annual per capita grain output would have to reach 600 kg per capita to raise enough animals to bring pork consumption up to a level that would permit protein needs to be met by red meat production and this of course is totally out of the picture for this century so the country will have to continue to rely heavily on soybean and other traditional sources of protein ("Soybeans healthy substitute for meat", China Daily, July 16, 1990). There is little doubt that eventually as income increases diets will favor livestock products that increase the demand for grains to be fed in livestock rations over additional direct consumption of food grains, but it is less clear what the outcome of this will be for wheat consumption per se.

WHEAT CONSUMPTION AND PRODUCTION PATTERNS

Historically China has consistently imported wheat each year over the period 1960-87 (Table 1). Wheat comprises the largest component of the country's grain imports. From 1960 to 1976 imports varied over a range of 2 to 5 million metric tons. In 1977 wheat purchases jumped to over 8 million metric tons and went on climbing to around 13 million metric tons in the early 1980s. After the Post Mao surge in production following establishment of the family household responsibility contract system, imports dropped off for a brief period, but with crop reversals having occurred four years in a row, imports of wheat have surged to new record levels in the last three years. China's imports of wheat this past year reached a recently estimated record level of 15.5 million metric tons. If the recent trend towards expanded imports continues China's purchases

will surpass those by Russia making it the largest importer of wheat in the world.

From a demand perspective, the dynamics of consumer behavior may be pointing to a shift in dietary patterns favoring wheat products as income growth and urbanization take place in China. Income grew by 11% in 1988 after an annual growth of 8.9 percent giving China one of the world's fastest rates for the decade 1978-87. Since policy makers have undertaken an austerity program to hold back on inflation this growth rate has been cut to 3.9 percent the past year, but even this is a respectable rate of economic growth for a period of retrenchment. Per capita wheat consumption has tripled since the early 1960s, and since 1975 it has doubled from 47 kg to about 95 kg (Table 1). Wheat consumption as a food item has grown relatively faster than rice, and other food sources such as tubers are actually in decline. In 1960 per capita rice consumption was double the level for wheat. Today wheat consumption per capita is approximately equal to the amount reported for rice.

Because of economic and sociological changes favoring wheat over rice and other food grains, a shift in grain consumption from food grains to feed grains has not yet translated into a decline in use and imports of wheat. While traveling in China this fall the authors were told on more than one occasion that wheat use is increasingly popular in the case of processed and convenience food products. As one example, instant noodles play a role analogous to the hamburger or pizza in the U.S. in the fast food industry that is rapidly evolving in China. According to an article in the China Daily newspaper, "Fast Food Hunger Growing Too Much For The Noodle Makers" (January 9, 1989), instant noodle production increased thirty fold from 1985 to 1989. The apparent shift to wheat based products is occurring in coastal urban areas that rely heavily upon imports. Thus far this shift has more than compensated for any decline in wheat consumption that may be occurring in regions that are traditionally large producers and consumers of wheat.

Focusing exclusively on livestock production and feed grain demand may be misleading in terms of developing perspective on China's future role in the world grain economy. As noted, dietary changes appear to be favoring food use of wheat in China as well as greater consumption of meat and livestock products. Another question is, even if livestock production increases the demand for feed, will China necessarily import more feed grains at the expense of wheat imports? One option is that China could feed its low quality wheat and import higher quality wheat. At this point China reportedly feeds very little of its wheat to livestock so a major shift in current practice would have to occur to have this be the case. However there is precedent for just this happening in the case of the Soviet Union when that country embarked upon an ambitious livestock expansion program. While the Soviets do purchase large quantities of feed grains, they also feed wheat produced domestically and purchase wheat on the world market to supplement milling uses.

Table 1: China's Wheat Production, Consumption, and Trade

Year	Production 1000mt	Total Consumption 1000mt	Population 1000	Per Capita Consumption kg	Net Imports 1000mt
1960	20960	23907	650000	36.78	1947
1961	14250	20521	660000	31.09	4771
1962	16665	19268	670000	28.76	4803
1963	18475	23070	680000	33.93	5095
1964	20840	26257	694710	37.80	4917
1965	25220	30998	710320	43.64	6278
1966	25280	30275	722220	41.92	4995
1967	28485	29628	734320	40.35	4143
1968	27455	30991	746620	41.51	3536
1969	27285	32909	811610	40.55	5124
1970	29185	32343	825810	39.17	3660
1971	32575	33538	840030	39.92	2963
1972	35985	37270	854210	43.63	5285
1973	35225	41365	893570	46.29	5640
1974	40865	41606	911250	45.66	5741
1975	45310	43510	927720	46.90	2200
1976	50385	48543	942800	51.49	3158
1977	41075	51675	957377	53.98	8600
1978	53840	52887	970667	54.49	8047
1979	62730	66595	938448	70.96	8865
1980	55210	75999	996134	76.29	13789
1981	59640	78840	1011219	77.97	13200
1982	68420	79420	1026504	77.37	13000
1983	81390	82990	1038419	79.92	9600
1984	87820	92220	1049705	87.85	7400
1985	85810	100410	1059521	94.77	6600
1986	90295	101795	1073700	94.81	8500
1987	87000	103500	1088570	95.08	11500
1988	86400	104400	1104000	94.57	15500
1989	91000	106500			

Another option is to place more domestic area into feed grain production or other alternative crops at the expense of domestic wheat production. At a recent meeting of scientists at the Chinese Academy of Agricultural Scientists in Beijing an agronomist, Professor Shi Dequan, argued that China can harvest 100 million tons of corn by the year 2000 (*China Daily*, "Ways to Solve Agro-issue", November 15, 1989, p.5). Whether a shift to greater domestic corn production at the expense of wheat is happening is difficult to document. In the five year span from 1984 through 1988, area planted to wheat declined by a little less than one million hectares, yields increased slightly and production seems to be leveling off (Table 2). During this same five year period area planted to corn increased by slightly more than one million hectares, yields stabilized, and production increased slightly. From 1985 to 1989 corn production increased

26.7% and wheat production increased only by 5.8%. The relative increase in corn production over wheat in this five year period does seem to reflect a slight shift in acreage to corn, but the degree of shift is not substantial enough to establish conclusively that a definite and significant trend to corn at the expense of wheat is occurring. If the 100 million ton figure for corn production is compared to the officially targeted 500 million ton total grain figure, this actually is in line with its current share of grain production. Nevertheless the recent apparent shift favoring corn production relative to wheat bears watching in the future to see what implications this may have for wheat imports.

Table 2: Wheat Area, Yield, and Production

Year	Area	Yield	Production
	million hectares	tons/hectare	million metric tons
1976	28.4	1.78	50.5
1977	28.0	1.46	41.0
1978	29.2	1.85	54.0
1979	29.36	2.14	62.73
1980	29.23	1.89	55.21
1981	28.31	2.11	59.64
1982	27.96	2.45	68.47
1983	29.05	2.80	81.39
1984	29.58	2.97	87.82
1985	29.22	2.94	85.81
1986	29.62	3.04	90.04
1987	28.81	2.98	85.90
1988	28.79	3.00	85.43
1989	29.84	3.05	90.80

Source: Economic Research Service, U.S. Department of Agriculture. China Agriculture and Trade and Situation and Outlook Report (various years).

Rapeseed production is cited by Halbrendt and Gempeasaw as the major substitute crop competing as an alternative to wheat production. In the Eastern region of China which consists of Jiangsu, Anhui, Zheijiang, and Shanghai provinces rapeseed production was 6.6mmt in 1987, accounting for 39 percent of the nation's production and wheat production at 8.8mmt accounted for 19 percent of national production (Webb, 1989). Wheat and Rapeseed are both produced in 6 of China's 7 major producing regions so the assertion that rapeseed competes with wheat as an alternative crop is plausible, but wheat also competes for land area with several other crops.

Wheat competes with rice for area but their relative share was about the same in 1989 as 1985. Wheat of course competes with other crops for area as well as with non crop uses of land. In fact the growth in grain production most recently has largely

been achieved by increasing sown area in grains and cutting down on cash crops. Comparative advantage arguments might cast this practice in doubt, but self sufficiency in grain including wheat is always a strong force and if China found itself alienated in the global diplomatic scene the country's leaders could fall back into the pattern of the sixties and early seventies. Finally in areas such as Henan province where cotton is produced wheat is produced in rotation with cotton. While cotton area is down relative to five years ago it appears that the area devoted to this crop has begun to increase again in the last couple of years.

CHINA'S FUTURE WHEAT NEEDS

The discussion in the preceding section brings out the importance of watching a complex pattern of production and consumption developments in discussing wheat. Having properly warned readers of how multifaceted China's wheat economy is we now generalize. Looking to the future, a set of scenarios of projected wheat import needs based upon official Chinese population projections for 1990 through the end of the century is constructed by coupling per capita wheat consumption with assumed production levels in table 3.

In constructing scenarios, current production and use levels are used as the low range of each and target levels implicit in official grain production and consumption projections for the year 2000 set the high range. Interim levels for 1995 are interpolated arbitrarily as mid point levels between the 1990 and 2000 ranges of production and consumption. 1990 import needs of 14.5 million metric tons (mmt) is calculated by multiplying population (1.1 billion) by 95 kilograms (kg) of consumption per capita and subtracting production assumed at 90 million metric tons. Lower and higher assumed levels of production provide the lower and higher levels of import needs. The projected level of import needs of 26.5 million metric tons in 2000 is based upon consumption (105 kg) and production (110 mmt) levels implied in official projections for the end of the century and an estimated population of 1.3 billion, etc.. Assuming no increase from the current per capita level of wheat consumed in China, even under the most optimistic range of production scenarios, China still would need to acquire at least 10 mmt of grain annually throughout the 1990s, and if wheat production only increases modestly this could exceed 30 mmt by the end of the century.

Targeted future wheat production was projected on the assumption that wheat production will hold the same share of production as its current share which averaged 22% for the period 1984-88. This scenario would result in targeted wheat production reaching 110 million metric tons by the year 2000. This increase would have to depend on increased yields as its source since there is little reason to believe that area planted to wheat is going to increase from past experience. This would amount to more than a 20 percent increase in yields in the next decade.

Whether wheat output can reach 110 million metric tons by the end of the century through increased yields is questionable. Greater use of chemical fertilizer and pesticides is going to be expensive since China's current consumption of these inputs required it to spend over \$3.7 billion in hard currency in 1988 in imports of fertilizer and chemical agents. More chemicals and fertilizer may not be a simple solution even if the economic costs are ignored. The wheat study team in October was told by Ministry of Agriculture officials that unbalanced chemical fertilizer use, especially Nitrogen, has caused problems with powdery mildew diseases in major winter wheat production areas in the last two years. So while greater use of fertilizer paid off in enhancing yields ten years ago this sort of easy avenue to increasing yields could be running into limits.

The study team was advised by officials in the Ministry of Agriculture that better or more intensive management practices could increase yields another 10 percent and that they expect to develop a hybrid wheat which would boost yields 10 to 20 percent. Whether these claims will be borne out will of course be determined by history.

Table 3: Projected Wheat Import Needs (1990, 1995 and 2000).¹

<u>1990 Excess Demand Scenarios</u>			
	(95 mmt crop)	(90 mmt crop)	(85 mmt crop)
Current Use (95 kg)	9.5 mmt	14.5 mmt	19.5 mmt
<u>1995 Excess Demand Scenarios</u>			
	(100 mmt crop)	(95 mmt crop)	(90 mmt crop)
High Use (100 kg)	20.0 mmt	25.0 mmt	30.0 mmt
Current Use (95 kg)	11.0 mmt	16.0 mmt	21.0 mmt
<u>2000 Excess Demand Scenarios</u>			
	(110 mmt crop)	(100 mmt crop)	(95 mmt crop)
High Use (105 kg)	26.5 mmt	36.5 mmt	41.5 mmt
Current Use (95 kg)	13.5 mmt	23.5 mmt	33.5 mmt

¹Projections based on officially expected population of 1.1 billion in 1990, 1.2 billion in 1995, and 1.3 billion in 2000.

Historically the purchase price for cereals has been kept artificially low since the 1950s. The government raised prices

for grain by 24 percent in 1979, but this was largely offset by price increases in farm inputs. Prices for grains were raised by 18 to 25 percent in 1989. If real wheat purchase prices paid to producers were increased to stimulate production or retail prices charged to consumers were increased to curtail consumption this would of course have implications for wheat imports. Fiscal constraints discourage the former price move and political pressures constrain the latter course of action.

The configuration of domestic food demand and supply events discussed above that may shape China's profile in the world wheat economy in the next decade points to the difficulty of making reliable projections of future trade. China's gap between demand and supply will translate into commercial trade in the world food economy only if the country is willing and able to allocate enough foreign exchange to purchase it.

China's economic and trade performance has been running erratically in recent years. As little as two years ago exports and foreign exchange earnings were increasing at astonishing levels. However it soon became apparent that bottlenecks and imbalances were becoming unsustainable. When inflation moved into the 20 to 30 percent range the authorities imposed austerity measures to halt excessive growth in the economy. When political turmoil escalated into the Tiananmen square incident causing foreign investors concern, speculation arose that China's economy is based upon a fragile or unsustainable foundation.

The State's official position is that this fear is unfounded. The State Statistical Bureau has announced that in the first two months of this year retail price inflation halted and the nation is running a \$500 million surplus in foreign trade. While China's revealing a foreign debt of around \$40 billion has created uneasiness about its ability to service its foreign payments commitments, the State Administration of Exchange Control claims growth in debt has halted. According to official statistics that have been released China's debt service ratio hovers at about 15 percent and is projected to stay below 20 percent. This is comfortably below the rule of thumb 25 percent level that is often considered an important warning point of a nation's ability to service its international commitments.

Whether China's government position about its current and future economic health is correct will be determined by actual events that unfold over the next decade. This will primarily depend on how successful the government will be in adjusting to the economic and political dilemma of how to reconcile changing without losing control with the need to exercise control without setting off an uncontrollable force for political and economic change.

In summary, China is likely to need to import large and growing quantities of wheat through the 1990s. Whether it will be able to do so will hinge on the political stability and economic performance of its system which is being challenge by

the same tensions that plagued the Eastern European communist countries in the 1980s. Their economic and political problems and attendant foreign financial difficulties forced them to cut back drastically on grain purchases even though they needed the imports. China will be a major influence on grain markets in the 1990s one way or the other.

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