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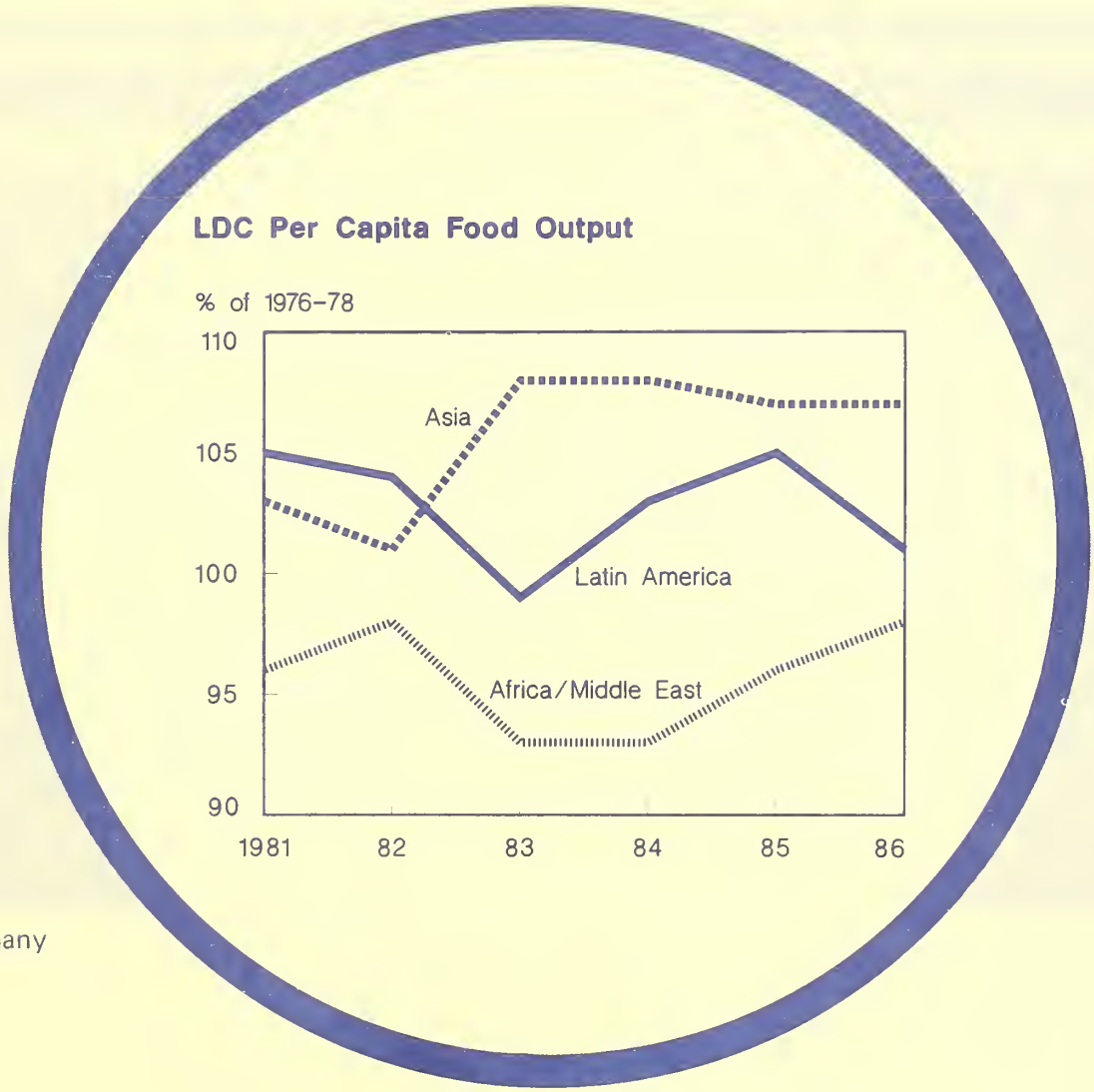

ood production rises in many
frican countries.

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Situation Coordinators:
Cecil W. Davison (202) 786–1687
Polly Cochran (202) 786–1688

Electronic Word Processing:
Erma McCray

International Economics Division, Economic Research Service
U.S. Department of Agriculture, Washington, D.C. 20250

Note: Tons are metric, dollars are U.S., and rice is on a milled basis unless specified otherwise.

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SUMMARY

World food production in 1986 rose almost 1 percent from a year earlier. Output increased in developing and centrally planned countries, but declined in the developed countries, primarily in response to surplus stocks and low prices. Global population growth outpaced food production, causing per capita output to decline nearly 2 percent. Only the centrally planned country group showed an increase in per capita food output. In the developing countries, drought-related shortfalls in South America pulled per capita production down 1 percent.

Within the developing world, total food aid needs across 69 of the least developed countries subsided for 1986/87, as needs declined in many countries in Africa, the Middle-East, and Asia. Grain production in Sub-Saharan Africa was record high in 1986, with gains in almost every country from Mauritania to Zimbabwe. Food needs in Central America rose, however, worsened by drought-reduced crops and civil strife.

Record wheat production in 1986/87 is pushing global wheat consumption for food to a new high. The green revolution for wheat has enhanced food production in many developing countries. Higher yielding varieties have been particularly effective where spring wheat is a common crop. However, many developing countries in tropical climates, such as Sub-Saharan Africa, Southeast Asia, and Central America, are not well adapted for wheat production, and improved varieties are not the answer to rising food needs.

At the other end of the food consumption spectrum, Europeans and Americans have reached a plateau of about 3,300 calories daily, with around 40 percent coming from foods of animal origin. In contrast, the Japanese consume about 2,600 calories daily, with about 22 percent coming from animal products. Globally, per capita meat consumption changed little in 1986 as output matched population gains. Per capita beef consumption is forecast to decline in 1987, while per capita poultry and pork output and consumption are expected to rise. As incomes improve in low and middle-income countries, animal products replace grain and vegetable products in diets.

Vegetable oil consumption is also strongly correlated with income growth. World per capita consumption of vegetable oil will rise in 1986/87 for the third straight year. Soybean oil constitutes almost 30 percent of vegetable oil consumption, while palm oil is the most traded.

Although economic growth prospects for the developing countries are improving for U.S. exports, debt financing continues to absorb a significant portion of expenditures, and currencies of many developing countries have not appreciated against the dollar like those of some industrialized countries. As a result, U.S. exports are not significantly more price attractive to many developing countries.

WORLD ECONOMIC CONDITIONS

Global Assessment

The world economy, excluding the United States, will grow at about the same real rate in 1987 as last year's modest 2.6 percent. However, concerns over persistent international trade and payments imbalances, particularly among developed countries, and less developed countries' (LDC's) debt have led some analysts to expect this year's real growth to be lower by half a percentage point.

Developed Country Growth Unchanged

The biggest influence on 1987 growth forecasts in the industrialized countries is the long-anticipated effect of the past 2 years' dollar depreciation on the huge U.S. merchandise trade deficit. Despite little indication in the trade figures to date, 1987, with stronger export growth and weaker import growth, may show some narrowing of the U.S. trade deficit.

Such a scenario suggests a decrease in export-stimulated growth for other industrialized countries. Since domestic demand in these countries, despite lower inflation, interest rates, and oil prices, may just compensate for decreased export demand, forecasts show real 1987 economic growth to be unchanged from 1986's 2.5 percent.

Should domestic demand in these countries prove weaker than expected (an increasingly likely event), growth could be around 2 percent. None of these projections implies that 1987 agricultural exports will receive a major boost from these countries, despite gains in price competitiveness.

Developing Country Growth To Rise

The outlook for developing countries in 1987 is mixed. Developing countries have benefited greatly from lower inflation, the dramatic fall in interest rates and, in the case of oil-importing countries, lower oil prices. These developments should continue, providing a positive influence during 1987. Countering these factors is the prospect of lower export earnings, caused by generally lower commodity prices in combination with modest economic growth in the developed countries. In addition, LDC debt problems appear to be intensifying, and could prove a significant damper on growth.

Of the downside factors, commodity prices currently hold the greater significance for 1987 growth in the LDC's, though the debt problem is quickly catching up. Nonoil commodity prices, as reported by the IMF, have fallen an average 13.5 percent since 1984, and may fall another 5 to 10 percent in 1987. On the upside, interest rates are not expected to increase greatly in 1987, and have been forecast by some to decline. Lower interest rates can boost developing country growth significantly. The 5-percentage-point drop in the London Interbank Offer Rate between 1984 and September 1986 is estimated to have saved LDC's $18 billion in net interest payments.

Oil prices advanced to around $19 per barrel in January, softened in February, but have since recovered. Oil prices are currently expected to remain near $19. However, there is some risk that prices could fall, with at least some indication that certain OPEC members either are or soon will exceed their production limits. On balance, lower oil prices have boosted developing country growth, but countries such as Mexico and Nigeria would face severe difficulties should prices fall significantly again.

In total, growth in the LDC's in 1987 could be a full percentage point improvement over 1986, reaching 3 percent. However, this overall growth rate masks the diversity that exists among various countries and regions. The largest difference is between oil-exporting countries, expected to grow just under 1 percent in 1987, and non-oil-exporting countries' growth at 4.5. Taking a less optimistic view, 1987 LDC growth could well be 2 to 2.5 percent. Oil-exporting country growth would be essentially unchanged, and non-oil-exporting countries would grow 3 to 3.5 percent, with a potential for still lower figures should export earnings and debt problems intensify.

Prospects for 1987 U.S. agricultural exports to the developing countries are uncertain. While current growth prospects for the LDC's appear reasonable, a significant portion of these countries' export earnings is already devoted to debt financing (e.g. Latin American countries 46 percent and Asian

countries 13). In addition, many developing countries' currencies have maintained a fairly steady value, or in Mexico's case depreciated, vis-a-vis the dollar. As a result, the improvement in price competitiveness of U.S. exports to developing countries will be less than those to industrial countries.

Developing Country Debt Problems Return

The developing-country debt situation has recently turned much more uncertain. Any further weakness in oil prices will be a significant threat to Mexican growth prospects, and has already been particularly injurious to Ecuador (loss of $1 billion in 1986 revenues, equaling one-third of export earnings), which recently missed an interest payment.

Brazil has suspended payments on its $109-billion debt. Negotiations over rescheduling are proving difficult. The essence of the negotiations is whether Brazil will get terms similar to Mexico, i.e. lower interest rates, extended repayment schedules, and new financing. While private banks are adamant about Mexican rescheduling not setting a precedent, Brazil will not happily accept less. Perhaps more important is the fear that Brazil's actions will influence many, if not all, of Latin America's debtor countries to pursue similar actions and terms.

Dollar Exchange Rates

The dollar, with barely a 2.5-percent decline against the major currencies between July and Christmas, plunged more than 7 percent in the post-holiday weeks. Uncertainty among traders about U.S. support for the dollar lead to the steep declines, and prevented favorable economic news from lending more support to the dollar. Traders took a wait-and-see attitude, in anticipation of a significant agreement on exchange rates that was expected to emerge from a meeting of the major industrial countries. Prior to the meeting, many expected a discussion of "reference rate" proposals for major exchange rates.

Meeting To Stabilize the Dollar

Finance ministers from the top five major industrial countries (G-5)-- the United States, United Kingdom, Japan, Germany, and France--met February 21-22 in Paris to discuss possible ways to quiet the dollar's recent volatility and alleviate trade uncertainty about its future course. The G-5 ministers--joined later by the remaining G-7 countries of Canada and Italy--announced measures designed to ensure exchange rate stability around current exchange rates. Italy's representative, however, left abruptly, angered by the apparent prior arrangement among G-5 ministers.

Although no specific "reference rates" (exchange rates triggering central bank intervention) were announced, the ministers all agreed that present exchange rates should be maintained because they reflect current economic conditions. While the brunt of maintaining prevailing currency rates will fall in the medium term on fiscal policy--retrenchment in the United States and newly announced stimulus in Germany and Japan--the implication for the near term is that G-5 central banks plus Canada will intervene together to keep major market pressure from depressing the dollar much below its current values.

While current and already proposed economic policies should maintain current

Foreign currency units per U.S. dollar

Year	Mark	Yen	Pound	Guilder	Can$
1980	1.818	226.4	.4299	1.987	1.169
1981	2.257	220.2	.4983	2.492	1.198
1982	2.427	248.8	.5722	2.669	1.233
1983	2.554	237.4	.6597	2.853	1.232
1984	2.847	237.6	.7517	3.209	1.295
1985	2.942	238.3	.7790	3.319	1.365
1986	2.170	168.4	.6818	2.447	1.389
Jan.	2.437	199.8	.7014	2.746	1.407
Feb.	2.330	184.8	.6999	2.632	1.404
Mar.	2.276	178.6	.6809	2.565	1.400
Apr.	2.268	174.7	.6671	2.560	1.387
May	2.226	166.9	.6564	2.505	1.375
June	2.232	167.4	.6625	2.513	1.389
July	2.148	158.1	.6631	2.422	1.380
Aug.	2.060	154.1	.6726	2.324	1.388
Sept.	2.041	154.6	.6809	2.303	1.387
Oct.	2.005	156.4	.7006	2.265	1.388
Nov.	2.023	162.8	.7017	2.286	1.386
Dec.	1.988	162.2	.6945	2.248	1.379
1987					
Jan	1.858	154.7	.6641	2.096	1.360
Feb.	1.823	153.3	.6541	2.058	1.334
Mar 1/	1.843	152.8	.6304	2.082	1.324

1/ Preliminary.

exchange rates with little central bank intervention, the commitment of the six countries to support current exchange rates hinges on both stimulating Japanese and German demand and reducing the U.S. budget deficit. Without visible signs of fiscal progress, the ministers' support for current exchange rates is likely to lapse, possibly leading to further dollar declines.

Lower U.S. short-term commercial interest rates---around 5.9 percent in January--than abroad---around 6.5 percent--may also account for some of the dollar's recent weakness. To help offset this, and to stimulate sluggish domestic economies dampened by rapid currency appreciation and resultant slower export sales, Germany lowered its discount rate to 3 percent on January 22. The Japanese rate was lowered to 2.5 percent on February 20. These reductions provide further support for the dollar by widening short-term interest rate differentials, since the U.S. discount rate remained unchanged at 5.5 percent. *[Tim Baxter and Ted Wilson (202) 786-1688]*

U.S. AGRICULTURAL TRADE

The U.S. agricultural trade surplus is expected to increase 10 percent to $6 billion in fiscal 1987. Export volume is expected to rise, offsetting much of the impact of lower prices for cotton, grains, and oilseeds, and the value of imports is expected to fall for the first time in 5 years.

Drought in Brazil, the world's largest coffee producer, cut world coffee production significantly in marketing year 1986/87, pushing prices to their highest in a decade. Concern that drought would restrain Brazil's production again in 1987/88 sustained prices through much of 1986. Uncertainty about future availability also may have helped raise the volume of coffee imports as well, since imports exceeded consumption. With a 25-percent increase in price and slightly higher volume, coffee imports rose $1.2 billion in fiscal 1986, boosting total agricultural import value nearly as much.

Outlook for Fiscal 1987

Prospects for a rebounding coffee crop firmed late in 1986. Brazil's production is now expected to reach 33 million bags, compared with only 16 million the year before. With world supplies assured, coffee producing members of the International Coffee Organization (ICO) sought reintroduction of export quotas to support prices. However, disarray among producers on quota distribution, and a reluctance by consuming nations to endorse an outdated mechanism for distributing quotas, postponed agreement. Continued absence of ICO quotas will mean further downward pressure on coffee prices, and U.S. coffee imports in 1987 are forecast to fall $1.2 billion to their pre-drought value.

Rebounding cotton sales, a result of implementation of a U.S. marketing loan program, are recapturing the U.S. share of world cotton markets lost in 1986. U.S. cotton exports are expected to be $1 billion higher, and the value of cattle hide exports are expected to rise as well, boosted by substantially higher prices.

Although the U.S. agricultural trade surplus is expected to increase, lower prices will reduce the value of U.S. grain exports and horticultural and animal product imports will rise. Lower U.S. beef production is expected to mean increased import volume and prices. A record deciduous fruit harvest in Chile, and increased vegetable production in Mexico will increase exportable supplies in two countries whose exchange rates remain very favorable for exporting to the United States. *[Stephen MacDonald (202) 786-1621]*

WORLD COMMODITY DEVELOPMENTS

Wheat and Rice

World wheat production will reach a record 528 million tons in 1986/87 and per capita consumption will be 5 percent above the 1979-81 average of 82 kilograms (kg). Even with the increased consumption, stocks will grow to 150 million tons. Rice production, at 319 million tons, is down slightly from the 1985/86 record. However, per capita consumption will rise to 64 kg, 6 percent above the 1979-81 average.

Wheat and rice consumption is influenced by income and population growth, migration from rural to urban areas, government policies that influence production and consumer prices, and the prices of imports and exports of rice

U.S. agricultural export values 1/

Commodity	1984	1985	1986	1987 F
	Billion dollars			
Grains and feeds	17.4	13.3	9.5	8.1
Wheat and prod.	6.8	4.5	3.5	3.0
Rice	.9	.7	.6	.5
Feed grains and products	8.2	6.9	3.8	2.8
Oilseeds and prod.	8.8	6.2	6.3	5.9
Soybeans	5.7	3.9	4.2	3.8
Soybean cake and meal	1.2	.8	1.1	1.1
Soybean oil	.6	.6	.3	.3
Livestock prod.	3.5	3.3	3.5	3.7
Poultry prod.	.4	.4	.5	.6
Dairy prod.	.4	.4	.4	.5
Horticultural prod.	2.6	2.6	2.7	3.0
Cotton, incl. linters	2.4	1.9	.7	1.8
Tobacco	1.4	1.6	1.3	1.2
Other	1.1	1.5	1.4	1.2
Total	38.0	31.2	26.3	26.0

1/ Fiscal year. F = forecast.

U.S. agricultural import values 1/

Commodity	1984	1985	1986	1987 F
	Billion dollars			
Competitive				
Dairy & poultry prod.	.9	.9	.9	.9
Meat & meat prod.	1.9	2.2	2.2	2.5
Other animal prod.	1.1	1.1	1.1	1.2
Fruits, nuts & vegetables	3.0	3.5	3.5	3.7
Oilseeds & prod.	.8	.8	.6	.6
Sugar & related prod.	1.5	1.3	1.0	.9
Wines & malt beverages	1.5	1.6	1.8	1.8
Other	1.5	1.5	2.0	1.9
Noncompetitive				
Bananas & plantains	.7	.8	.7	.7
Coffee, green & processed	3.3	3.2	4.4	3.2
Cocoa beans & prod.	1.1	1.3	1.2	1.2
Rubber & allied gums	.9	.7	.6	.6
Other	.7	.8	.9	.8
Total	18.9	19.7	20.9	20.0

1/ Fiscal year. F = forecast.

International commodity prices

Year	Wheat				Corn		Soybeans	Soyoil	Soymeal 44%	
	U.S. 1/	Arg. 2/	Can. 3/	Aust. 4/	U.S. 5/	Arg. 2/	U.S. 5/	U.S. 6/	U.S. 6/	Hamburg 7/
	Dollars per metric ton									
1980	176	203	192	175	129	159	272	522	217	271
1981	176	190	194	175	135	139	272	464	223	269
1982	161	166	165	160	110	109	233	404	197	233
1983	158	138	167	161	137	133	269	518	222	255
1984	153	135	166	153	138	132	271	678	184	210
1985	137	106	173	141	114	103	214	596	140	171
1986	117	88	161	120	89	83	200	361	174	197
Jan.	133	108	189	140	108	100	210	447	168	197
Feb.	131	102	183	133	105	92	207	404	169	201
Mar.	136	97	189	139	101	87	208	384	180	210
Apr.	138	96	187	137	102	86	205	389	173	205
May	128	90	185	131	106	90	205	391	174	199
June	107	85	169	114	106	90	203	369	175	191
July	103	81	160	104	85	84	200	357	179	193
Aug.	104	80	137	104	74	82	198	312	182	200
Sept.	104	81	133	105	67	78	197	305	183	202
Oct.	105	80	130	108	67	70	188	322	168	197
Nov.	107	79	133	111	74	71	193	323	170	190
Dec.	109	78	133	110	74	68	189	324	165	184
1987										
Jan.	110	82	136	110	70	66	188	341	163	197
Feb.	114	92	138	112	69	66	187	335	169	197

1/ No. 2 hard winter, ordinary protein, f.o.b. Gulf ports. 2/ F.o.b. Buenos Aires. 3/ No. 1 western red spring, 13.5% protein, in store Thunder Bay. 4/ July-June crop year, standard white, f.o.b. selling price. 5/ U.S. No. 3 yellow, f.o.b. Gulf ports. 6/ Decatur. 7/ F.o.b. ex-mill.

Wheat: Per capita consumption 1/

Country	1964-66	1974-76	1979-81	1986
	Kilograms per year			
Developed	93.9	91.7	90.8	90.1
U.S.	79.4	83.2	84.2	87.3
W. Europe	115.5	110.3	109.5	107.7
Japan	45.6	49.9	50.3	50.2
S. Africa	55.1	63.9	62.8	61.3
Centrally planned	95.5	99.2	110.9	119.7
E. Europe	162.7	166.2	168.9	179.9
USSR	236.1	233.5	228.6	198.4
China	39.7	52.8	71.5	90.7
Developing	40.7	49.6	54.7	57.7
Latin America	51.0	57.6	58.4	57.9
Mexico	33.6	45.3	46.1	42.7
Brazil	28.3	48.2	52.8	54.5
Middle East	157.3	177.4	195.3	190.6
Iraq	120.3	163.8	192.9	205.6
Turkey	240.9	232.7	265.1	254.8
South Asia	40.7	50.1	56.7	62.4
India	34.7	43.2	50.0	57.1
Pakistan	103.5	120.1	125.2	126.2
Other Asia	91.3	116.8	132.1	144.9
Indonesia	.2	6.0	8.5	8.7
Thailand	1.3	2.1	4.0	3.8
North Africa	118.5	160.6	175.6	162.2
Algeria	126.5	174.4	182.5	200.7
Egypt	118.3	148.3	170.9	166.6
Other Africa	8.4	10.7	13.7	15.4
Nigeria	1.9	7.0	15.6	10.6
Sudan	18.9	27.5	27.9	33.9
World	69.3	73.3	78.3	81.9

1/ Average of crop years beginning in year shown. Excludes feed use but includes seed and industrial use.

Rice: Per capita consumption 1/

Country	1964-66	1974-76	1979-81	1986
	Kilograms per year			
Developed	21.1	18.5	18.2	17.4
U.S.	5.4	6.9	8.9	8.9
W. Europe	3.8	3.9	4.1	4.5
Japan	119.4	94.9	87.4	80.7
S. Africa	2.8	2.9	4.3	5.7
Centrally planned	56.6	66.9	72.9	82.9
E. Europe	3.0	3.2	3.4	3.7
USSR	2.9	5.9	9.1	6.3
China	82.6	92.7	99.6	113.9
Developing	60.9	62.3	65.9	66.9
Latin America	26.2	25.9	29.4	29.7
Mexico	5.1	5.3	5.2	5.3
Brazil	51.3	44.2	49.5	50.7
Middle East	13.2	17.7	21.2	22.4
Iraq	13.9	24.6	34.9	37.8
Turkey	3.9	4.7	4.9	5.2
South Asia	72.9	73.1	75.8	78.1
India	66.9	68.6	72.5	76.6
Pakistan	19.8	25.1	25.5	20.6
Other Asia	273.0	281.5	296.4	307.7
Indonesia	93.7	116.8	133.9	145.8
Thailand	178.3	180.2	171.2	163.8
North Africa	13.9	18.0	16.9	14.1
Algeria	0.5	0.4	1.1	1.1
Egypt	27.7	36.5	34.3	31.8
Other Africa	12.9	12.9	16.7	15.4
Nigeria	4.3	5.2	13.1	10.8
Sudan	0.6	0.4	0.6	0.9
World	51.6	56.2	59.9	63.7

1/ Average of crop years beginning in year shown. Excludes feed use but includes seed and industrial use.

and competing crops. Intense competition among exporters has recently sharply lowered the cost of imports to grain-deficit regions. However, foreign exchange constraints and excellent grain harvests over much of the world are restraining world import demand. World wheat trade in 1986/87 is estimated at 88 million tons, up slightly from last year, but still 10 percent below 1984-86. Rice trade, however, is expected to be 11 percent below 1986 and 7 below 1984-86.

Consumption Up in Developing Countries

Annual per capita wheat and rice consumption has been declining in developed countries since the mid-1960's, but has stabilized at about 90 kg for wheat and 17 for rice. In contrast, developing countries have shown a 42-percent increase in per capita wheat consumption since 1964-66, while rice consumption has risen 10 percent.

In Sub-Saharan Africa, wheat production has recovered since 1984, when the region was forced to import nearly 6 million tons of wheat and 2.7 million tons of rice at the height of a devastating drought. The region, characterized by a high population growth rate, has continued to import over 5 million tons of wheat and 2.4 million tons of rice per year since 1984 to keep per capita consumption stable.

Domestic Output and Consumption Gain

Annual per capita wheat and rice consumption has stabilized in Latin America at about 58 kg and 29 kg, respectively. Wheat production has averaged 21 million tons (1984-86), a 40-percent increase over the 1979-81 average. As a result, imports have declined 18 percent since the early 1980's.

Wheat and rice production in Asia has nearly doubled in the last 10 years due to the expansion of the Green Revolution, particularly in South Asia and China. Production gains have allowed traditional rice importers such as South Korea and Indonesia to become self-sufficient. While per capita consumption of wheat and rice has risen throughout Asia, gains are especially significant in China where consumers have made a major shift in their diets from coarse grains to wheat and rice. Per capita wheat consumption has leveled off in Japan but continues to rise in the other industrialized economies of East Asia as consumers begin to substitute other wheat and nongrain products for rice.

Imports Spur Gains in the Middle East

Wheat production in North Africa and the Middle East has also been increasing steadily over the last 10 years, but imports into the two regions remain high at an estimated 24 million tons in 1986/87, or 27 percent of total world wheat trade. The Middle East is also a significant rice importer, representing 22 percent of 1987 world trade. Per capita rice consumption is currently 22.4 kg, 21 percent over 1974-76. Wheat and rice exporters have tried to increase their market shares in North Africa and the Middle East by providing export credit programs and concessionary loan terms. For example, the two regions have accounted for 82 percent of U.S. Export Enhancement Program sales since the program began in 1985. As a result, these regions have been able to keep per capita wheat consumption relatively high despite declining oil revenues.

In the Soviet Union, per capita wheat consumption is declining as its population diversifies its diet. In 1986/87, the Soviets produced 92.3 million tons of wheat, the largest crop since 1980/81. Despite this strong performance, the Soviets are expected to import 15 million tons of wheat, 17 percent of world trade. This is a sharp decline from the 1981-84 average of 22 million tons, which accounted for over 20 percent of world trade. *[Sara Schwartz (202) 786-1691]*

Coarse Grains

Nonfeed per capita consumption of coarse grains in the world has gradually declined over the last 20 years. Since 1964-66, world per capita use has dropped about 20 percent, to an average of 49 kg. However, precise estimates of human consumption are impossible in many countries because nonfeed use also includes that used for industrial purposes, such as making starch or alcohol.

With plentiful production and record stocks, 1986/87 utilization of coarse grains--including feed use--is expected to reach a record high. Even with many countries facing debt problems, there are few, if any, areas where use is being significantly constrained by tight supplies. World coarse grain production, at 839 million tons, is down less than 1 percent from the record outturn of 1985/86. However, all the reduction is in the United States as foreign production is up 3 percent to a record. Consequently, trade will remain relatively depressed and world ending stocks will rise to 226 million tons, 25 percent above last year's record. An additional factor constraining trade is abundant supplies of favorably priced wheat and rice.

Coarse grains: Per capita consumption 1/

Country	1964-66	1974-76	1979-81	1986
	Kilograms per year			
Developed	55	65	75	87
U.S.	71	81	103	145
W. Europe	47	63	65	62
Japan	17	19	26	31
South Africa	163	151	145	127
Centrally planned 2/	107	120	114	120
USSR	105	128	119	117
Developing	53	51	47	43
Developing Asia	35	32	30	26
India	48	43	40	32
N. Africa & Mid. East	65	61	43	29
Algeria	101	116	75	48
Latin America	68	67	66	64
Central Am. 3/	87	89	88	77
Mexico	155	165	172	151
Venezuela	63	62	77	38
Sub-Saharan Africa	100	98	93	91
Kenya	176	150	142	124
Sudan	100	133	117	140
Zimbabwe	207	189	192	190
World	62	63	61	50

1/ Average of crop years beginning in year shown. Excludes feed use but includes seed and industrial use. 2/ Excludes China and Cuba. 3/ Excludes Nicaragua.

Developing Countries' Nonfeed Use Down

Coarse grains play the most important role in diets in the developing countries, particularly Sub-Saharan Africa and Latin America. For the developing countries overall, where there is relatively little industrial use, the declining trend of nonfeed coarse grain consumption has sharpened in recent years. Average annual per capita nonfeed use, at 42 kg in 1984-86, is down 16 percent from the mid-1970's and 20 percent below the mid-1960's. This change is largely explained by the substitution of wheat and rice for coarse grains and increased consumption of meat and livestock products.

Large Differences Among Countries

There are wide variations in the consumption patterns of developing countries that are disguised by averages. The highest consumption levels in the world are found in Southern Africa, where corn traditionally dominates the diet. Per capita human consumption of coarse grains exceeds 175 kg per year in Malawi, Zambia, and Zimbabwe. Consumption is also very high in East Africa, with levels typically well over 100 kg. Consumption in South Africa has decreased in recent years, partly because wheat consumption has risen, but remains above 125 kg. Outside of Sub-Saharan Africa, Mexico stands out with average nonfeed use of over 150 kg, despite some gains in wheat consumption.

While there is a general decline in consumption in the developing countries, there are considerable annual fluctuations, resulting from variability in production, economic conditions, subsidies, and world and local trade policies.

Developed Countries' Use Increasing

Within the developed countries, nonfeed use of coarse grains has been steadily increasing. Over the last 2 decades, average per capita use has risen more than 50 percent to 87 kg per year. This growth appears to be mainly from increased industrial use, rather than direct consumption. In the United States, there has been a dramatic increase in the use of corn sweeteners. High fructose corn syrup (HFCS) is now the biggest single nonfeed use of corn, with average per capita use rising more than fivefold in the last decade to 35 kg this year. Total nonfeed use of corn is estimated at 120 kg per capita in the United States.

Centrally Planned Food Use Drops

In the centrally planned countries, there tend to be more fluctuations in coarse grain production and use. In the USSR, direct food use represents only about one-fifth of nonfeed use, because of large amounts of dockage and waste and other uses. There appears to be a long-term decline in Soviet food use of coarse grains, from just over 27 kg per capita in the mid-1970's to under 25 this year. China has probably shown the most dramatic change of any country in the world in the past decade. Per capita food use may have dropped from nearly 60 kg to about 30 at present. *[Pete Riley (202) 786-1691]*

Vegetable Oil

Abundant supplies of low-priced vegetable oil mean that world per capita consumption in 1986/87 will rise for the third consecutive year and approach 9.5 kg. Total consumption of vegetable oil will be up more than 2 percent to a record 48 million tons.

At the beginning of the current marketing year, global vegetable oil stocks totaled an unprecedented 5.2 million tons. Three consecutive years of record oilseed output have produced a glut of vegetable oil that has driven prices to their lowest in more than 10 years. Although there has been some firming of vegetable oil prices in recent months because of reduced palm oil production prospects in Southeast Asia, no sharp recovery to 1984-85 levels is foreseen in the short run.

Soybean Oil Leads in Consumption

Soybean oil ranks first in vegetable oil consumption, accounting for almost 30 percent of world use. In 1986/87, per capita consumption of soybean oil will rise almost 3 percent to 2.8 kg. World output of soybean oil will rise because sharp gains in foreign soybean production substantially exceed the drop in U.S. output.

Palm oil, soybean oil's chief rival, holds first place among vegetable oils traded in

world markets and second place in terms of consumption. Over the past 2 years, per capita consumption of palm oil rose more than 10 percent annually. This year, however, reduced production will slow the growth of palm oil use. Malaysian production will decline more than 270,000 tons and its exports

Vegetable oils: Per capita consumption 1/

Country	1976/77	1985/86	1986/87
	Kilograms per year		
Developed	16.04	20.71	20.97
U.S.	20.88	24.96	25.56
W. Europe	16.15	21.44	21.51
EC-12	16.51	21.97	22.01
Other West Eur.	12.56	16.12	16.53
Japan	10.07	13.62	14.06
South Africa	6.29	9.55	8.88
Centrally planned	3.98	6.12	6.04
East Europe	9.35	12.58	13.05
USSR	10.69	11.88	11.95
China	1.40	3.75	3.55
Developing	5.82	7.85	7.96
Latin America	8.16	11.84	11.80
Mexico	4.70	10.45	9.98
Brazil	10.32	14.69	14.72
South Asia	4.59	5.48	5.53
India	5.12	5.49	5.44
Pakistan	5.13	10.19	11.13
East Asia	3.00	8.17	8.31
Korea, Rep of	1.19	8.34	8.52
Taiwan	8.15	13.06	13.57
Other Asia	4.69	7.97	8.21
Thailand	1.86	3.72	4.22
Indonesia	5.36	8.98	9.16
No. Afr/Mideast	9.08	13.38	13.70
Egypt	9.66	12.24	12.23
Algeria	9.53	15.26	15.53
Turkey	9.69	14.05	15.38
Iraq	9.08	14.69	16.06
Other Africa	6.45	6.19	6.25
Nigeria	9.12	8.86	9.03
Sudan	7.19	5.85	6.59
World	7.04	9.41	9.47

1/ Includes industrial use.

Vegetable oil consumption, 1987

Oil	Total	Per capita
	Million metric tons	Kilograms
Soybean	14.0	2.8
Palm	8.2	1.7
Sunflowerseed	6.6	1.3
Rape	6.3	1.3
Cottonseed	3.2	.7
Peanut	3.2	.6
Coconut	3.2	.6
Olive	1.7	.3
Palm kernel	1.1	.2
Total	47.5	9.5

almost 110,000 tons. Nonetheless, of the nine major vegetable oils, palm oil will register the largest year-to-year per capita consumption increase, up more than 3 percent to 1.6 kg. Sunflowerseed oil will also increase around 2 percent to 1.3 kg per person. In contrast, declining production will result in reduced per capita consumption of cottonseed, olive, and peanut oils.

Consumption Spurred by Income Gains

Per capita vegetable oil consumption is strongly correlated with income. The United States ranks first at 25.6 kg, followed by Western Europe's 21.5. Average per capita consumption of developed countries is more than double that of developing and centrally planned countries, but this gap has narrowed over the last 10 years.

Income is usually the most important factor determining vegetable oil consumption. But prices, technology, cultural factors, the availability of substitutes, such as animal fats, and government programs also shape both the level and the mix of vegetable oil use. Since there is a high degree of substitutability among vegetable oils, relative prices play a significant role in determining which vegetable oils are purchased by food processors. For example, if the price difference between soybean and palm oil remains within a certain range, margarine production costs will be minimized by using soybean oil. However, when palm prices fall below this range, more palm oil is used.

Nonetheless, there are limits with respect to the degree of substitutability among vegetable oils. Technology determines which oils can be channeled to human consumption and which have to be allocated for industrial uses. For example, palm oil was mainly used as an ingredient in making soap and candles, but technological advances have broadened its use so that it is now an important ingredient in the production of margarine, shortening, and salad oils.

Traditional Tastes Still Important

Because taste is markedly influenced by culture and tradition in many countries, it often plays as large a role as income in determining per capita consumption levels. For instance, in Eastern Europe, per capita

vegetable oil consumption in Bulgaria is more than seven times that of the more affluent German Democratic Republic because East Germans prefer more animal fats. A similar combination of factors is responsible for the EC having to export about one-third of its domestically produced rapeseed oil even though it is less than 50 percent self-sufficient in oilseed production and rapeseed oil is heavily discounted compared with soybean and other vegetable oils.

Changing attitudes about which foods are most beneficial to health are shaping consumption patterns. In the United States, for example, there is a growing perception that the soft oils in general are more healthful because of their higher content of unsaturated fatty acids. Lauric oils, such as palm kernel and coconut oils, contain more saturated fatty acids. Recently, a soybean trade association asked the U.S. Food and Drug Administration to require food manufacturers to indicate the presence of these saturated fats.

Government Programs Also Influence Use

The level and mix of vegetable oil consumption are also influenced by government production and trade programs. For example, in the early 1960's, Malaysian government financial assistance to its farmers resulted in a sevenfold increase in Malaysian palm oil production between 1970 and 1983.

More recently, the EC has spurred its oilseed production with very generous crushing aids. The crushing aid makes up the difference between the world price and the much higher producer price which the crusher must pay the EC oilseed producers. EC minimum prices for oilseeds currently range about 3 times higher than world prices. EC authorities are considering imposing a tax on domestically produced and imported vegetable oils to help finance its expensive oilseed regime. If such a tax were imposed, EC per capita vegetable oil consumption would likely decline and per capita consumption of butter, of which the EC has a mountain of surplus stocks, would increase.

U.S. exports will again benefit from government assistance in 1986/87. U.S. soybean oil exports are forecast to rise 7 percent to 612,000 tons. While part of the gain will be due to reduced world palm oil output, U.S. export assistance programs will also play a large role. GSM-102 credit guarantees and P.L. 480 agreements will expand U.S. sales in foreign markets. As of mid-March, $165 million and $28 million of sales, respectively, had been announced, slightly behind last year's pace. In addition, 25,000 tons of vegetable oil have been sold to India under the U.S. Export Enhancement Program. *[Tom Bickerton (202) 786-1691]*

Meat

Meat plays an increasingly important role in world diets. Average per capita meat consumption in the major countries rose from 31 kg in 1975-76 to 35 in 1985-86. This represents a growth in total consumption from 98 to 125 million tons.

Pork and poultry continued to gain prominence in the major countries over the past 10 years while per capita beef consumption declined. Per capita consumption of lamb, mutton, and goat stayed relatively constant.

In 1986, there was little change in per capita meat consumption as the 2-percent gain in total use was only able to keep pace with gains in population.

No Change in Per Capita Beef Consumption

Per capita beef consumption in 1986 was little changed from the year before, but is forecast to decline in 1987. While up slightly in the United States and Oceania in 1986, a

Per capita beef and veal consumption

Country	1983	1984	1985	1986 1/
		Kg, carcass wt.		
United States	49.0	49.0	49.2	49.6
Canada	41.7	40.1	40.6	39.5
Mexico	16.2	17.0	16.9	15.3
Argentina	66.2	76.4	80.8	82.1
Brazil	15.6	13.2	14.1	12.0
EC-12	22.2	22.4	22.7	22.9
USSR	27.6	28.2	27.7	28.1
Japan	5.8	6.1	6.3	6.5
Australia	42.5	41.1	40.9	43.7
51-country average 2/	16.4	16.3	16.3	16.2

1/ Preliminary. 2/ Countries included in FAS annual circular on livestock and poultry.

small offsetting decline occurred in South America.

Per capita consumption of beef in the United States should fall in 1987, as reduced cattle inventories and an end to herd liquidation lower domestic supplies. The trigger level for the Meat Import Law, which regulates imports of fresh or frozen beef, has been set at 1,440 million pounds, the same as in 1986. With reduced domestic supplies and little change in imports, total U.S. beef consumption should be down in 1987.

Drought in some areas of Australia forced heavy slaughter in 1986 and domestic consumption, as well as exports, rose. Recent EC efforts to reduce dairy surpluses could mean renewed emphasis on cow slaughter this year and per capita consumption would at least remain at last year's level.

Brazil's meat supplies were hard hit in mid-1986 as producers held cattle from slaughter because the Government froze beef prices as part of measures to reduce inflation. Normally a major exporter, Brazil began to import beef to make up for the shortfall and build stocks for the next dry season. Not all of the meat purchased in 1986 has been delivered because of shipping difficulties. Now that beef prices have been allowed to rise in Brazil, production and consumption should be up in 1987.

Per Capita Pork Consumption Trends Up

Per capita consumption of pork rose slightly in 1986 and may inch up again in 1987, continuing the trend of increased pig meat consumption over the last 10 years. European countries, particularly Hungary and East Germany, are the world's largest pork consumers. Last year, pork accounted for 60 percent of East Europe's meat consumption. This compares to only 25 percent in the United States. In areas such as North Africa and the Middle East, pork consumption is practically nonexistent because of religious beliefs.

While pork consumption rose in Eastern and Western Europe and China in 1986, it fell in the United States and Canada. In the United States, hog producers are expected to begin expanding output this year and per capita consumption will likely be up in 1987.

Per capita pork consumption

Country	1983	1984	1985	1986 1/
	Kg, carcass wt.			
United States	30.2	30.0	29.7	28.1
Canada	28.6	27.8	28.5	26.3
Mexico	15.0	12.1	10.9	11.3
EC-12	33.6	33.8	34.0	34.7
Germany, Fed. Rep.	50.7	50.9	51.8	52.1
France	34.8	34.8	34.9	35.5
Netherlands	37.3	36.8	37.2	38.9
Germany, Dem. Rep.	61.1	59.9	62.4	61.4
Poland	39.8	34.9	38.5	43.8
USSR	21.5	22.0	22.1	21.8
China	12.7	13.8	15.6	16.2
Taiwan	26.2	34.6	38.0	36.7
Japan	13.9	14.2	14.3	14.9
37-country average 2/	19.8	19.9	20.7	20.9

1/ Preliminary. 2/ Countries included in FAS annual circular on livestock and poultry.

Reduced feed prices have helped keep the hog/feed price ratio favorable in the EC. Even though pressured by ample supplies of other meats, pork consumption in the EC should continue to increase. In China, however, high feed prices may keep the hog sector from expanding, thereby slowing growth in Chinese consumption.

Gains Continue for Poultry Consumption

Output and per capita consumption of poultry continues to climb, spurred by increased use in fast food outlets, lower feed prices, and the lower price of poultry relative to red meat. In the United States, even with increased red meat consumption, poultry meat use rose 5 percent per person in 1986 and an even larger increase is expected this year.

Brazil's demand for poultry increased in 1986 because of the unavailability of beef in the second part of the year. Poultry meat exports were down as more output was diverted to the domestic market. In the Middle East, consumption increases just kept pace with population growth. Low world beef prices may have encouraged increased beef imports into the Middle East, thus moderating demand for poultry.

Most of Eastern Europe consumed more poultry per person in 1986 than the year

Per capita poultry consumption

Country	1983	1984	1985	1986 1/
	Kg, carcass wt.			
United States	29.7	30.5	31.6	33.1
Canada	23.3	23.5	25.0	25.8
Mexico	7.2	8.5	8.0	7.6
Brazil	9.7	8.2	9.2	9.5
EC-12	15.4	15.3	15.6	15.8
Italy	17.5	17.0	16.7	16.8
France	17.3	17.2	17.7	17.9
Spain	21.5	20.9	21.4	21.2
Poland	5.6	7.0	7.6	7.6
USSR	10.3	10.2	10.2	10.3
Hong Kong	25.0	26.7	29.4	33.1
Japan	11.4	11.8	12.2	12.5
45-country average 2/	14.3	14.4	14.8	15.0

1/ Preliminary. 2/ Countries included in FAS annual circular on livestock and poultry.

before. However, Romania's consumption dropped because poor weather and lower feed supplies reduced poultry production. This resulted in a slight decline in per capita consumption for the region in 1986, but some gain is expected this year. *[Linda M. Bailey (202) 786-1691]*

Cotton

World Cotton Supplies Fall

In contrast to other crops, world cotton stocks are dropping this year because production has fallen while consumption is showing healthy gains. World production in 1986/87 is expected to drop 9 million bales to 70 million. Area fell 6 percent, accounting for about half the drop with the remainder caused by weather-related yield reductions. The four largest producers, the United States, China, the Soviet Union, and India, all experienced significantly reduced crops.

World consumption is expected to reach its sixth consecutive record in 1986/87, rising to 77 million bales, up 3 percent from last season's 7-percent growth. Much of the this season's growth is due to steady increases in world population and incomes, but a significant part is resulting from fiber substitution and other factors, such as lower costs. Increasing consumer preferences for cotton in textiles and low prices of cotton relative to polyester, particularly between August and November, encouraged substitution. Many millers were also able to cut costs by contracting for their entire season's expected demand very early in the season when prices were lowest.

World stocks are expected to fall 17 percent to 40 million bales at the end of 1986/87 but remain well above pre-1984/85 levels. However, excluding China's stocks, which account for more than 35 percent of the world total, ending stocks will be 43 percent of consumption, slightly above the 1974-84 average stocks-to-use ratio of 40 percent.

Prices and U.S. Exports Recover

Cotton prices rose sharply from mid-September through December, leveling off in the last few months. Much of the increase was in response to deteriorating output in the four largest producing countries. In addition, it now appears that China's still ample stocks will not flood world export markets because of inaccessibility and very low quality; instead, China is likely to export a stable quantity of better quality cotton.

Despite the price recovery, consumption growth shows no signs of slowing. U.S. mill consumption this year is expected to rise

Cotton: Production, consumption, and net exports

Country	1985/86 Prod.	1985/86 Cons.	1985/86 Net exp.	1986/87 F Prod.	1986/87 F Cons.	1986/87 F Net exp.
	Million 480-lb. bales					
Major exporters						
U.S.	13.4	6.4	1.9	9.8	7.0	6.7
USSR	12.1	9.6	2.4	11.2	9.7	1.8
Pakistan	5.7	2.3	3.1	6.1	2.5	3.0
Egypt	2.0	1.6	.5	1.9	1.5	.4
Turkey	2.4	2.1	.3	2.2	2.1	.1
Cent. Amer.	.6	.2	.4	.4	.2	.1
Sudan	.7	.1	.6	.7	.1	.8
Brazil	3.8	3.1	.1	3.4	3.4	.2
Mexico	1.0	.7	.4	.7	.6	.1
India	8.4	7.2	.3	7.4	7.4	.6
China	19.0	17.5	2.9	16.3	17.5	2.5
Major importers						
W. Europe	1.1	5.9	-4.7	1.2	6.2	-5.2
Japan	0	3.1	-3.1	0	3.1	-3.1
E. Europe	.1	3.8	-3.8	.1	3.9	-3.9
S. Korea	--	1.7	-1.7	--	1.8	-1.8
Taiwan	0	1.5	-1.5	0	1.6	-1.6
Hong Kong	0	.8	-1.1	0	.9	-1.2
Residual	8.6	7.2	+3.0	8.3	7.6	+.5
World	78.9	74.8		69.7	77.1	

Year beginning August 1. -- = negligible. F = forecast.

nearly 10 percent from 1985/86's 16-percent growth. Consumption continues to rise substantially in the important cotton markets of Taiwan, Hong Kong, South Korea, Indonesia, Thailand, and the Philippines. Slower growth is evident in other important markets.

These consumption gains and competitive U.S. prices will cause 1986/87 U.S. exports to more than triple to 6.8 million bales. The United States will nearly regain its 1980-84 average 30-percent share of the world market. Shipments to the six previously mentioned Asian consumers and Japan are projected to be 72 percent of total U.S. cotton exports, up from 61 percent in 1984/85 and 1985/86. *[Carolyn Whitton (202) 786-1691]*

REGIONAL DEVELOPMENTS

Western Hemisphere

U.S. Program Holds Production Down

U.S. agricultural production in 1986 was modestly below 1985, but supplies for 1987 are more than adequate for estimated domestic requirements and exports. Crops accounted for the decline as livestock output increased slightly. Total agricultural output in 1987 is likely to decline again because of increased Government acreage reduction program requirements.

The current crop situation is characterized by large stocks, substantial crops, static demand, and low prices. Corn and sorghum yields for 1986 were excellent

Indices of agricultural production

Country	1982	1983	1984	1985	1986 1/	1986 / 1985
			1976-78 = 100			Percent
United States	113	92	109	115	109	-5.2
Canada	118	113	110	120	131	9.2
Mexico	114	119	117	118	121	2.5
Caribbean	118	116	119	117	114	-2.6
Central America	103	97	106	99	103	4.0
South America	118	115	123	132	126	-4.5
W. Hemisphere	114	109	114	117	117	0

1/ Preliminary.

and production will likely exceed total estimated use during the 1987 crop year. Consequently, yearend stocks will rise again. Stocks-to-use ratios will continue high for wheat (88 percent) corn (84 percent) and soybeans (33 percent). However, ratios will decline for rice (from 62 to 46 percent) and cotton (112 to 40 percent). Acres planted to food and feed grains in 1987 are expected to decline because of higher acreage reduction requirements for wheat, corn, and sorghum and a 15-percent paid land diversion program for feed grains. In addition, program participation should be heavy. Winter wheat plantings this past fall were 10 percent below the previous season and the lowest since 1978.

Livestock expansion has been restrained despite favorable livestock/feed price ratios. Both cattle and hog inventories are at a cyclical low. Dairy cattle numbers are declining because of the Dairy Termination Program. However, broiler and turkey production have been profitable and are expanding. Total red meat and poultry consumption in 1987 is likely to decline only 1.4 pounds per person with a 5.9-pound decline in red meat being offset by a 4.5-pound increase in poultry.

Farm income in 1986 was about the same as a year earlier because declining cash receipts offset smaller cash expenses and increased Government payments. During 1987, larger Government payments should offset lower crop receipts and, as expenses decline, net income will rise.

Canola From Canada Enters U.S. Markets

A Canadian food product that has been around for many years has only recently been permitted as an import into the United States under GRAS (Generally Regarded As Safe) guidelines. The product, canola oil, is rapeseed oil which is low in both erucic acid and glucosinilate. Plant breeders have succeeded in lowering the level of the two undesirable characteristics to a point where the product has become acceptable under U.S. food safety criteria. The Proctor and Gamble Corporation is currently marketing canola oil under the brand name "Puritan" in competition with soybean and other vegetable oils.

In the past decade canola production in Canada has ranged from 1.8 to 3.9 million tons

per year. The value of canola oil (when the purchasing power of the Canadian dollar is held constant) has ranged from $472 million to $1 billion a year. However, canola exports are not the only bright spot in Canada's agricultural trade picture. Despite the expected decrease in world trade in fiscal 1987, Canada's export performance in grains and oilseeds has been quite favorable to date. The volume of grains and oilseeds already exported for the 1986/87 marketing year, which started on August 1, showed a 14-percent increase.

Higher Mexican Imports Expected for 1987

Reduced production subsidies and poorly timed announcement of new support prices may contribute to holding farm production below last year. Also, poor weather in northwestern Mexico has reduced production of dry beans, tobacco, coffee, and vegetable crops. Final damage estimates are uncertain because of possible replanting and shifting to alternative crops. Only sorghum production is expected to rise.

An increase in import demand for livestock products and feeds is reinforced by slightly improved prospects for economic growth. Negative real growth in 1986 should be replaced by a 1- to 2-percent increase in economic output in 1987. As a result, import demand for sorghum, soybeans, feed wheat, and feed corn should increase. Sorghum imports may be lower than earlier estimates if feed wheat and feed corn continue to be substituted for sorghum. Low world prices for grains and oilseeds should also provide an incentive to rebuild stocks.

The United States will likely benefit from larger Mexican imports. Besides being a reliable supplier with a long history of trade with Mexico, the United States is also offering GSM-102 export credits. Credit for fiscal 1987 is $750 million of which 70 percent has been allocated for feed grains and oilseeds, 7 percent for edible beans, 8 percent for vegetable oils and meals, and 5 percent for inedible tallow. Mexico will likely use most of the export credit available unless its financial situation improves considerably.

Central American Output Up in 1986

The Central American index of agricultural production rose about 4 percent in 1986 after dropping 7 percent in 1985. The increase is centered in Costa Rica where output was up 14 percent. With a 6-percent decline, Nicaragua was the only country with reduced production. Over the past 10 years, Central American agricultural production has increased less than 1 percent annually. However, on a per capita basis it has decreased nearly 3 percent a year, with Nicaragua showing the biggest decline.

Agricultural output was near or above record during 1986 for Costa Rica, Guatemala, Honduras, and Panama. Although El Salvador's production increased almost 4 percent, it fell short of the 1979 record. In Costa Rica, substantial gains in crops and livestock output boosted agricultural output to the 1984 record. Production in 1987 is likely to decrease because drought hit most of the countries during the planting season.

The region has a dualistic agricultural economy in which crops and livestock products for export are more valuable and more intensively produced than those for domestic consumption. Guatemala has the region's largest agricultural sector, which accounts for 26 percent of the region's output in value terms. Nicaragua and El Salvador, before their civil wars, accounted for 18 and 25 percent of the total; however this percentage has dropped to 14 and 20. Costa Rica, Honduras, and Panama produced 21, 14, and 7 percent, respectively, of the region's output.

Caribbean Per Capita Output Falls

During the past 10 years, per capita food production in the Caribbean has declined steadily, although total output has just about held its own. Indices of agricultural production show that although per capita production increased in Cuba and Barbados, it declined steadily in many of the other countries.

Until 1985, Cuba was doing better than other countries in the Basin. Both sugar and domestic food production were steadily increasing. But Cuba has not broken its historical dependence on sugar, and the consequences have been costly. Droughts and

a series of management errors in the cane fields have reduced raw sugar production during the last 2 years and problems have been reported with the current crop. Cuba is still a major sugar exporter, but it may have to buy some sugar in the next year or two to fill its export commitments to the Soviet Union and Eastern European countries.

Agricultural production also declined in the Dominican Republic. A 40-percent drop in sugar output during the last 3 years overshadowed significant gains from diversification in the agricultural sector. Lower sugar quotas in the U.S. market have contributed to the substantial increase in Dominican sugar stocks.

Food production in the rest of the Caribbean has been stagnant in recent years. During the rest of the 1980's, the demand for U.S. agricultural exports throughout the Caribbean is expected to continue to grow steadily.

Andean Agriculture Keeps Improving

Andean agricultural production rose in 1986 and is expected to show moderate gains in 1987. Despite continued growth in the region's grain production, some imports of wheat and coarse grain are necessary to satisfy increasing demand.

Larger wheat production in Chile has reduced import needs from 400,000 tons to less than 150,000 in the last 2 years. Other countries produce only limited quantities of wheat and demand factors determine their import requirements. Venezuela has harvested a bumper corn crop. This added production will be absorbed by a growing feed manufacturing industry. The Venezuelan Government has restricted corn imports in 1987. In contrast, Chile is increasing coarse grain imports because of a decline in corn production. The region's rice production fell 4 percent in 1985 as higher output in Ecuador was offset by shortfalls in Colombia, Peru, and Bolivia.

Brazilian Food Consumption Increases

Brazilian food consumption rose in 1986 although production declined 5 percent. Reforms implemented by the new Government since March 1985 have boosted consumption. Salaries were increased, strong economic expansion led to increased employment, and food prices were frozen. However, incentives to increase food output were diminished by a prolonged drought in mid-1986 that reduced soybean, coffee, and corn output. But the Government stood by its commitment to provide ample food supplies by importing large quantities of staples.

Despite the drought, farmers harvested bumper crops of wheat and rice. Consumption of these commodities increased 18 and 15 percent. Corn output declined but imports and a reduction in stocks permitted a 3-percent increase in consumption.

Large increases in consumption are not expected to continue in 1987 because consumer incomes are unlikely to expand significantly and food price increases will dampen consumption.

Argentine Beef Exports Remain Low

Beef prices are currently one of the few bright spots in Argentina's farm sector. The higher prices are due largely to domestic economic factors since beef exports are still running below average. Dairy liquidation policies in the European Community are largely responsible for declining Argentine beef exports. Only 240,000 tons were exported in 1986, compared with the past 5-year average of 400,000 tons. Exports in 1987 are forecast at 300,000 tons.

In contrast to lackluster beef exports, per capita beef consumption rose to a record 83 kg in 1986, compared with an average of 70 kg during 1982-84. Increased domestic consumption was especially surprising considering higher beef prices. The Argentine Government usually assigns high priority to beef pricing to ensure accessible beef prices for local consumers, and to keep beef from affecting inflation indices too much. *[Nydia Suarez (202) 786-1662]*

Western Europe

The food issues in Western Europe are those of affluence: the pattern of consumer expenditures and the effect of farm policies on consumers. In the European Community

(EC), the Common Agricultural Policy (CAP) has stimulated farm production, resulting in growing surpluses and growing budget pressure to finance them. EC consumers spend a higher proportion of their budget on food than their U.S. counterparts, and some analysts have concluded that consumers bear a large part of the CAP burden, through high internal prices maintained with levies on imports.

Saturation Points

Both Europeans and Americans consume a relatively high level of calories. Organization for Economic Co-operation and Development (OECD) estimates suggest that both regions have reached a plateau of about 3,300 calories daily (1982), representing an apparent upper limit for average human capacity. In contrast, Japan, another high income country, consumes about 2,600 calories per person daily. Consumption of calories derived from foods of animal origin is also high in the United States and Europe, at around 40 percent, again reflecting a similar standard of living, and considerable overlap in cultural environment as well. In contrast, the Japanese take about 22 percent of their calories from animal products.

Nevertheless, food consumption patterns vary both between the United States and the EC, and among EC countries. Notably, the Mediterranean EC countries with low and rising incomes--Italy, Greece, Spain, and Portugal--continue to replace vegetable calories, especially grain products, with animal calories. Elsewhere, the percentage of calories derived from animal products has tended to remain steady in recent years. Variations among countries are even wider below the level of broad indicators; differences in country patterns can be striking.

Per capita consumption, 1982

Country	Meat	Dairy	Fruit and vegetables
	Kilograms		
United States	112.0	147.9	164.4
France	109.2	143.1	199.1
Germany	97.1	145.8	196.3
Ireland	96.8	301.8	125.4
Italy	78.5	114.9	21.2

Source: OECD, Food Consumption Statistics, 1973-1982.

EC Consumer Versus the CAP?

In both the EC and the United States the proportion of expenditures spent on food, at homes and in restaurants, is far less than in nonindustrial countries. (Unfortunately, OECD data combine spending in restaurants and hotels.) However, in the EC, consumers spend a larger percentage than in the United States, substantially larger in the comparatively less affluent countries, especially the Mediterranean ones. The differences may in part reflect relative affluence and certain social or cultural features (such as frequency of dining out and restaurant overhead costs). The CAP, though, is also an influence.

The CAP was created with food security rather than price foremost in mind. The most important goal was to maintain farm incomes. Benefits to the consumer, therefore, would come primarily through a high degree of food self-sufficiency within the EC. That aim has been achieved for many commodities, as evidenced by the large surpluses. The achievement has been costly, however, requiring ever greater budget expenditures to finance production, storage, and disposal, since EC prices paid for farm goods are generally considerably above world prices. Much of the burden may have been shifted to the EC consumer.

Effect of Policies on Consumption

The consumption differences among EC countries partly reflect retail price differentials among competing food group categories. Retail prices partly reflect the CAP, as it affects country or regional supply factors and food processing costs. Consumption can be skewed accordingly. For example, although Ireland's per capita Gross Domestic Product is in the range with the less affluent EC countries, its consumption of animal calories resembles the more affluent. The CAP and a suitable physical environment have favored Irish animal production, so that Irish beef and dairy products effectively compete with fruits and vegetables, largely imported.

Food share of consumer expenditures and GDP per person, 1984

Country 1/	Food, beverages, and tobacco	A Food	B Expenditures in restaurants, cafes, and hotels	A + B	GDP per person
		Percent of household expenditure 2/			Dollars
United States	15.2	11.7	5.8	17.5	15,688
Belgium	25.2	19.1	4.5	23.6	7,878
Denmark	24.9	17.2	4.9	22.2	10,601
France	21.5	17.9	7.0	24.9	8,924
Germany 3/	23.4	21.3	NA	NA	10,025
Greece	43.3	36.9	6.3	43.2	3,383
Ireland	42.5	24.4	1.2	25.6	5,393
Italy	29.9	25.6	8.4	34.0	6,144
Luxembourg	21.1	16.2	NA	NA	9,235
Netherlands	19.5	15.0	5.0	19.9	8,534
Portugal	38.2	33.1	9.1	42.2	2,417
Spain	31.7	NA	NA	NA	4,126 4/
United Kingdom	20.0	14.5	12.0	26.5	7,507

NA = not available. 1/ United States, Ireland, 1983; Luxembourg, Spain, 1982; Portugal, 1981. 2/ Calculated in national currencies at nominal values. 3/ Food purchased away from home included in food. 4/ 1983.

Sources: OECD, National Accounts, 1972-1984, Vol. II; IMF, International Financial Statistics; ERS population data.

EC programs addressed specifically to consumers are few, and are intended to shrink the costly surpluses accumulated through the CAP incentives for farm output. The subsidized Christmas butter sales and school milk programs are notable instances of consumer-targeted EC schemes. The effect on consumption has been in doubt, though. With caloric intake at a high level in the EC, consumer subsidy programs may do little more than replace retail sales that would occur in their absence, as appears to be the case with Christmas butter sales. Only in some economically disadvantaged regions are the programs thought to increase consumption.

The CAP allows a certain leeway for national governments to influence food consumption. Mostly, instances occur when governments attempt to control inflation or aid low-income families by controlling retail prices for basic foods (such as bread). Price control measures can also be delegated to regional authorities within EC countries. However, in all cases, the CAP, because it determines the range of prices paid to farmers, also effectively guides national/regional decisionmaking regarding any retail prices subject to administrative control. *[Miles Lambert and Lorna Aldrich (202) 786-1716]*

USSR

According to the USSR Central Statistical Administration, gross agricultural output increased 5.1 percent in 1986. Significant increases in animal products and grain, potato, vegetable and fruit output more than compensated for declines in cotton and

sugarbeet production. Soviet reports also indicate that the production of nongrain feeds and oilseeds was up slightly from 1985.

1986 Grain Production Largest in 8 Years

Grain production in 1986 totaled 210.1 million tons, the fourth best and the largest harvest since the 1978 record of 237.4 million tons. Wheat output was the largest in 5 years, and procurement of high-quality wheat rose significantly, according to Soviet reports. Production of rye, barley, and oats likely rose from 1985. Corn production, however, apparently affected by summer drought, totaled a dismal 12.5 million tons, 13 percent below 1985.

The Soviets attribute most of the increase in grain output to their intensive technology program, which calls for more efficient use of inputs and resources. However, other factors cannot be ignored. Increased incentives due to higher procurement prices, changes in wheat quality procurement specifications, improved productivity resulting from expanded collective contracts, broad-ranging crackdowns on mismanagement and alcoholism, continuing advances in agro-technical research, increased farmer understanding of new farming techniques, and particularly favorable weather during the harvest have all contributed to the bumper crop.

Production of potatoes and vegetables increased 16 percent and 5 percent, respectively, from 1985. While the production of sunflowerseed increased slightly to 5.3 million tons, sugarbeet output fell about 4 percent to 79.3 million tons. Due largely to the extremely hot and dry weather in Central Asia, production of seed cotton declined 6 percent to 8.23 million tons.

The livestock sector was another bright spot in 1986, and was indicative of the success of Gorbachev's program to increase productivity and efficiency. Cattle, hog, and poultry inventories reached alltime highs and meat and egg production was a record. Most of the increase was due to increased output per head. Despite the drop in cow herds, continued improvement in milk yields--up 6 percent on state and collective farms--allowed for the highest production to date.

The Soviets continued their efforts to expand the production, quality, and use of inputs in line with the intensive technology program. In 1986, output of mineral fertilizers rose 5 percent, and although pesticide production fell 4 percent--in line with plans--quality of plant protectants likely rose somewhat. The production of tractors and combines was basically unchanged, with concentration instead on reconditioning of the existing fleet.

While it is still too early to assess the 1987 Soviet grain crop, above average winterkill likely occurred on winter grains, following a severe cold spell in January. However, any actual 1987 harvest losses due to winterkill could be somewhat offset by reseeding with spring grains.

Prospects for U.S. Exports Remain Poor

Following excellent Soviet grain and forage crops in 1986, USSR total grain imports in 1986/87 (July-June) are projected at their lowest since 1978/79, and about 15 percent below 1985/86. It is estimated that Canada and the EC will each account for about one-third of total Soviet grain imports, with the United States, Argentina, Eastern Europe, Australia, and the PRC providing most of the remainder.

Total Soviet wheat purchases through February of this marketing year are above purchases of the same period last year, a puzzling phenomenon, considering the large domestic crop and convertible-currency earnings shortfall. Increased use of imported wheat for feed, high-level stock-building, and a desire to take advantage of low world wheat prices are all possible explanations for the large purchases.

Soviet purchases of U.S. corn, currently about two-thirds of the minimum required during the 1986/87 (October-September) Long-Term Agreement (LTA) year, are expected to fulfill the agreement for corn sales. However, for the USSR to live up to its total import commitments stipulated in the fourth year of the LTA would require a change in recent buying patterns. Since November 1985, the Soviets have not purchased any U.S. wheat, and since May 1986 have been absent from the U.S. soybean market. *[Carolyn E. Duff and Christian J. Foster (202) 786-1710]*

Eastern Europe

The overall economic situation in the region in 1986 was satisfactory, but performance was marred by many problems. Foreign debt servicing continued to impose special hardships on Poland, Romania, and Yugoslavia, and to some extent on Hungary. Inflation in Yugoslavia reached nearly 80 percent, while in Poland it was 18. While food rationing was ending in Poland, some key food commodities were still rationed in Romania. The Chernobyl nuclear power accident in April affected agricultural exports to some extent but had no measurable effect on agricultural production.

Crop Output Continues To Expand

Crop production was good throughout the region and total grain output in 1986, at 112 million tons, was about 6 percent higher than a year earlier and the second highest in postwar history. Production was higher in every country except Hungary, where drought significantly reduced wheat output. Bulgaria and Yugoslavia also showed smaller wheat output. Poland experienced the greatest increase in wheat production, followed by Romania. Feed grain production increased more than wheat in all countries, with Yugoslavia and Romania showing best results, though the reliability of Romanian statistics is uncertain. Czechoslovakia, with total grain output of nearly 12 million tons, has almost become self-sufficient in grain production. Dry weather during and just after the harvest boosted grain quality by offsetting the chronic lack of drying facilities in Eastern Europe, ensuring excellent grain quality.

Production of other crops was also better than average. Rapeseed harvests in Poland and the German Democratic Republic (GDR) reached records, and Romania reportedly had excellent sunflowerseed and soybean crops. Total oilseed (rape, sunflowerseed, and soybean) production was about 9 percent above the 1985 level. There was also a substantial increase---nearly 7 percent---in potato production in Poland.

Livestock Sector Output Slips

The performance of the livestock sector, however, continued to be poor. Livestock numbers declined for the third year for cattle and for the second year for other animals, but since there were some increases in yields, meat production was about the same as in 1985. Milk production declined about 2 percent, principally because of a decline in Poland, though a milk price increase in the second half of the year improved production prospects. The unsatisfactory performance of the livestock sector was due to continuing shortages of protein meal concentrates. Livestock product shortages in Romania continue to be very serious because of poor quality, feed shortages, and a high volume of exports to service foreign debts.

Debts and Good Crops Hold Imports Down

The heavy external debt servicing burden of Poland and Romania and, to a lesser extent, of Yugoslavia and Hungary continued to depress imports. Total grain imports in 1986/87 are estimated at about 8 million tons, compared with 9.3 million in 1985/86, even with relatively high U.S. wheat exports to Poland and Yugoslavia under the Export Enhancement Program. Most of the region's wheat imports are destined for Poland and Yugoslavia, and coarse grain imports for GDR and Romania.

While the region's grain imports are down from last year, grain exports are up from 4.6 million tons in 1985/86 to 5.7 million in 1986/87, mostly in the form of Hungarian wheat and Romanian corn. The trend towards lower grain imports and higher exports is likely to continue into next year.

Exports of livestock and livestock products continued to expand but the direction of trade changed from the West to the Soviet Union as meat production surpluses grew in the West, and the EC and others imposed temporary restrictions on meat imports from Eastern Europe following the Chernobyl accident. Even after these restrictions were officially lifted, some resistance to such imports has lingered. The Soviet Union is likely to remain an expanding market for East European meat exports.

Slow Growth for U.S. Farm Exports Likely

Perennial hard currency and credit shortages and expanding domestic production will allow only a modest increase in U.S. exports to Eastern Europe. Export

Enhancement Program grain sales of over 1 million tons to Poland, Romania, and Yugoslavia will raise 1987 exports but will likely provide only a temporary improvement. Also, the United States will face stiff competition from other suppliers. For example, under a new agreement, Argentina will supply Hungary 400,000 tons of soybean pellets annually through 1990, and China has contracted to supply Hungary and Poland with soybeans, soybean meal, and cotton.

Crop Prospects for 1987 Appear Good

Winter grain sowing conditions in the northern countries were good, with adequate soil moisture and mild weather. After a prolonged drought in the southern countries, fall rains provided adequate soil moisture for healthy plant germination. Generally, winter grain appears to be in good shape. Despite unusual cold in December and January, the snow cover was adequate throughout the region. Some melting, however, occurred in GDR and Romania, exposing grain fields to freezes, but it is still too early in the season to assess the extent of crop damage, if any. The cold weather, however, may affect livestock production, since many farmers could not get enough coal or other fuel to heat barns. Moreover, insufficient and low-quality feed in some countries of the region, low producer prices, and slack export demand will continue to hold down the livestock sector during the year. *[Francis Urban (202) 786-1710]*

Australia

A major agricultural exporter, Australia produces foodstuffs in excess of domestic needs. Consumers have a plentiful supply of food, and prices are among the world's lowest.

The biggest dietary change of the 1980's has been the 16-percent decline in per capita beef and veal consumption. Production dropped sharply following the 1982/83 drought, because of the smaller herd. Both domestic consumption and exports have declined. Domestic prices are largely determined by export returns; when U.S. prices rise, consumers switch to other meats. Saleyard beef prices increased marginally in 1986 because weakness in the Australian dollar offset U.S. price declines. Prices may rise 15-20 percent in 1987 as U.S. prices strengthen.

Australian consumption of meat and seafood 1/

Item	1979-81	1985	1986	1987 F
	Kilograms per person			
Beef & veal	48.6	40.7	41.0	39.9
Poultry	20.1	22.9	23.6	24.5
Lamb	15.3	17.4	15.1	13.9
Mutton	4.5	6.9	7.3	7.6
Pork	15.0	16.5	16.5	17.1
Seafood	6.6	7.5	7.0	7.0
Total	110.1	111.9	110.5	110.0

F = Forecast. 1/ Meat is carcass weight and seafood edible weight. July-June year. 1984/85 = 1985.

Sources: Australian Bureau of Statistics, Bureau of Agricultural Economics, and ERS.

As the sheep herd expanded, mutton supplies increased. With export markets virtually nonexistent, prices plummeted. Per capita consumption, mostly in processed form, is rising after many years of decline. Disappointing lamb prices in 1985 led to reduced supplies in 1986 and 1987. Lamb prices recovered last year, and further gains are expected in 1987.

Per capita poultry meat and pork consumption have increased significantly in the 1980's as efficiency gains have reduced real prices. Low feed prices are encouraging continued growth.

Per capita milk consumption has held constant through the 1980's. Butter consumption has declined 2-1/2 percent annually, but cheese consumption has increased almost 4 percent annually. Per capita consumption of grain products has risen slightly as expanded consumption of breakfast foods (e.g. granola) and rice offset the continuing decline in bread demand.

Per capita fresh fruit consumption is growing, especially citrus fruits and exotic and tropical fruits, which are becoming more popular. Vegetable consumption is also up. Sugar consumption is slowly declining.

Wheat Supplies Large; Barley Down

The 1986/87 Australian wheat crop rose to 17.3 million tons because of unusually favorable spring and early summer weather. Exportable supplies remain plentiful, although weak demand is expected to reduce

shipments. Wheat plantings may decline about 2 percent in 1987/88, unless exceptionally good weather persuades producers otherwise.

Barley production fell 28 percent in 1986/87 because of poor price prospects and dry weather in some areas. Exports will likely decline from 3.5 million tons to about 2.3 million. Production is expected to remain low in 1987/88. *[Sally B. Byrne (202) 786-1611]*

Japan

Rice Consumption Declines, Stocks Build

Although the Japanese diet has traditionally centered on rice, the nation's most important crop, consumption has declined steadily over the last several decades. This downward trend is expected to continue as the Japanese include more meat, eggs, and dairy products in their diets. Total caloric intake per person in Japan has remained at around the same level (2,500-2,600 calories per day) for over a decade, and little or no increase is foreseen.

Three consecutive years (1984-1986) of abundant rice harvests and stagnant consumption mean that rice stocks will grow to an estimated 1.7 million tons by the end of the current marketing year (October 31, 1987). To reduce stocks to a more manageable level, the Ministry of Agriculture, Forestry, and Fisheries (MAFF) has increased the 1987 targeted riceland diversion area to 700,000 hectares, from 560,000 hectares last year. At the same time, MAFF will lower subsidies for riceland diversion to reduce budgetary outlays. In another step to ease the financial burden, the Food Agency, which controls the purchase, resale, and storage of rice, plans to store no more than 1.5 million tons, and has asked the cooperative organizations to hold any surplus above that level.

Criticism Sparks Debate

Recently, criticism of Japan's restrictive rice policies has generated some debate within Japan over its farm policy. In September, the American Rice Millers Association submitted a petition (under Section 301 of the 1974 Trade Act) against Japan's almost complete ban on rice imports. The U.S. Government rejected the petition but will urge Japan to discuss its rice policy in the new round of multilateral trade negotiations. Several important Japanese business organizations have begun to call for review or reform of Japan's food control system, including rice. Change in Japan's agricultural policy is not likely to be rapid; in the longer term, however, an aging and less politically influential farm population may set the stage for more fundamental reform.

High Yen Promotes Chicken Imports

Encouraged by a strong yen and lower tariffs, Japan has been rapidly increasing its poultry meat imports. Imports rose to an estimated 175,000 tons in 1986, up from 105,000 in 1985, and are expected to continue to grow this year. Although the volume of imports from the United States reached a record, the U.S. share declined to 43 percent from 46 percent in 1985 because of gains by Thailand and China. The surge in imports caused domestic broiler prices to plummet.

Imports of beef and pork increased in 1986 as well. Beef and veal imports reached an estimated 178,000 tons, up 18 percent from 1985. Currently, beef imports are limited by quotas, which are scheduled to expand through March 1988. The U.S. share of Japan's beef imports continued to rise following the 1984 U.S.-Japan understanding to increase high-quality beef imports 6,900 tons a year. Pork imports, which are subject to a variable levy, climbed to an estimated record 208,000 tons in 1986. The U.S. share did not improve much, as imports from Taiwan continued to grow.

In February, MAFF decided to reduce fiscal 1987 (starting April 1) support prices of beef, pork, and milk for processing. Because of lower interest rates and lower prices for feed due in part to the higher-valued yen, production costs are expected to decline sharply. *[Lois A. Caplan (202) 786-1611]*

Middle-Income East Asia (South Korea, Taiwan, Hong Kong)

Food security in middle-income East Asia is an important agricultural policy issue, and has become synonymous with a drive for self-sufficiency in rice and other food products, a goal made difficult by limited land area and climatic factors. Hong Kong imports

mostly finished food products, but both Korea and Taiwan supplement domestic supplies by importing raw agricultural products like coarse grains for feeding livestock, wheat for milling into flour, and cotton and hides for manufacturing textile and leather goods. The region is an important U.S. market for wheat, coarse grain, soybeans, cotton, and cattle hides. In fiscal 1987, the region is forecast to import $3.2 billion of U.S. farm products, a 15-percent increase from the previous year and about 12 percent of total U.S. farm exports.

Rice Remains Most Important Food Grain

Since rice is a staple in the traditional diet and the most important food grain, it is at the heart of the region's food security concern. Per capita rice consumption, however, has been decreasing. In 1985, per capita consumption of rice was 86 and 128 kilograms for Taiwan and Korea, respectively.

Taiwan's previous "more is better" policy has led to a serious rice surplus problem that has existed since the late 1970's. In addition to subsidizing exports, Taiwan implemented a riceland diversion program and rice-for-feed program (about 300,000 tons annually) in 1984. Production decreased 15 percent from 2.31 million tons in 1983 to 1.96 million in 1986. The Government estimates that self-sufficiency for rice will decrease from 105.2 percent in 1986 to 104.5 in 1987, and hopes to maintain the rate at 100 percent into the next century.

While Korea was a rice-deficit country throughout the 1970's, rice production in the past 4 years has outstripped consumption, requiring government intervention to manage large surpluses. The Government is encouraging the use of rice in processed foods and beverages to siphon off excessive stocks. The Government is also emphasizing expanded production of upland crops such as oilseeds, beans, and potatoes, and developing local forage supplies through pastureland and forage crop cultivation.

Livestock Products Continue To Expand

While traditional cereal consumption has leveled off, consumption of animal protein has increased. Import controls on livestock products are very restrictive in Korea and Taiwan; domestic production of pork, chicken, and eggs provides most domestic supplies. The large livestock industries in the region, however, depend heavily on imported feedstuffs. High farmgate prices and low feed costs in 1986 stimulated further expansion in the region's livestock industries. In Korea, inventories of hogs, chickens, and dairy cattle increased 17, 10, and 12 percent to 3.35 million head, 56 million birds, and 437,000 head respectively. The beef cattle inventory declined about 10 percent to 2.3 million head, primarily due to programs designed to reduce cow numbers through government purchases, slaughter of about 170,000 heifers, and the end of restrictions on slaughtering female cattle. Consequently, per capita consumption of red meat in 1986 is estimated at 12.2 kg, up 11 percent from 1985, while per capita chicken consumption remained at 3.1 kg.

In Taiwan, livestock production also expanded in 1986 despite typhoon damage in September to the poultry industry. Hog slaughter reached a record 10.5 million head. A strong Japanese yen boosted Taiwanese pork exports to Japan; pork exports jumped 31 percent from 1985 to 85,816 tons. *[Sophia Wu Huang (202) 786-1611]*

China

In 1986 output of most food products increased, food prices rose 7 percent, and consumption increased.

Items	Output 1000 tons	Percent change from 1985
Grain	391,090	3.2
Oilseeds	30,000	-4.0
Sugarcane	50,280	-2.5
Sugarbeets	8,310	-6.8
Fruit	13,400	15.2
Red meat	19,180	9.0
Milk	2,860	14.4
Eggs	7,600	40.0
Aquatic products	8,130	15.3

Given normal weather patterns in 1987, grain output may increase because cadres are pressing farmers to expand grain area and input supplies have improved over last year. Oilseed and sugar output will expand due to increased area. Meat, egg, and milk output should expand, but slowly because of tight feed supplies.

In 1986, China was basically a net exporter of food products. It was a net exporter of grains, oilseeds, and meals. China exported an estimated 100,000 tons of meat and close to 3 million live hogs. Sugar imports are estimated to be about 1.2 million tons. China could become a net food importer in 1987 because of rapid growth in demand. Grain imports are forecast to exceed exports. Edible oil imports could increase to meet growing requirements. Large quantities of raw sugar will be imported because of lower domestic output in 1986. Oilseed and meal exports likely will not increase. Exports of meat and live animals in 1987 will be up slightly.

Retail prices of all goods are estimated to have risen 6 percent in 1986. Nonstaple food prices rose an estimated 8 percent and staple food prices rose less rapidly so that the increase in all food prices was 7 percent. More austere economic measures being implemented in 1987 likely will restrain the overall price increase of food, especially staple foods. Nonstaple food prices probably will continue to increase but also at a slower rate than last year.

Urban incomes from 1978 to 1986 rose 2.8 times to an estimated 890 yuan (3.7 yuan = $1), while rural incomes tripled to 425 yuan. In this period of rising incomes, consumers purchased more wheat and rice products and per capita consumption of coarse grains and potatoes declined. Per capita consumption of pork doubled from 1978 to 14 kg in 1986, and consumer preferences, particularly in large cities, started shifting towards less fatty meat. Demand also increased for nonstaple foods such as beancurd, milk products, fruits, vegetables, and beverages that give variety to a largely starchy diet. Per capita incomes are expected to rise and current food consumption trends will continue into 1987. *[Frederick W. Crook (202) 786-1616]*

South Asia

Cereal Supplies Ample in Most of Region

Domestic cereal supplies in Bangladesh, India, and Pakistan are expected to maintain their upward trend in 1986/87, based on larger wheat and rice harvests. Production gains have led to the accumulation of large surpluses in India and Pakistan. Poor weather has interrupted the upward trend in rice output in Sri Lanka, but the setback appears not to be as serious as forecast earlier. However, FAO and USDA assessments indicate that Nepal has sustained a 15-percent drop in rice production because of poor weather. The setback has aggravated a downward trend in per capita food grain production and prompted the initiation of relief efforts by food aid donors.

The region's wheat imports in 1986/87 (July/June) are estimated at 3.2 million tons, down 16 percent from last year. Pakistan's termination of imports because of record production and stocks will cause the decline, more than offsetting somewhat larger imports by Bangladesh to ensure adequate stocks. U.S. wheat exports to the region are expected to slip 44 percent to 1.1 million tons, about half through P.L. 480 sales and the remainder through commercial programs. South Asian rice imports are forecast to rise 53 percent to 445,000 tons, but may be lower because of better crop prospects in Bangladesh and Sri Lanka. While both India and Pakistan are focusing on expanding domestic consumption to reduce cereal surpluses, they are also attempting to move larger quantities of wheat and rice into export markets. Stiff competition is expected to limit 1986/87 wheat exports by India and Pakistan to about 650,000 tons, but a record Pakistani rice crop and aggressive marketing could boost regional rice exports above the current forecast of 1.1 million tons.

Edible Oil Imports To Drop

South Asian imports of edible oils, now the region's major food import, are forecast at 2.1 million tons in 1986/87 (October/September), down 15 percent from last year and down nearly 10 percent from the previous assessment. Pakistan is expected to account for the bulk of the decline because unusually large imports late in 1985/86 led to record stocks and smaller 1986/87 import needs. Despite ongoing efforts to limit oil imports, India's purchases continue to be forecast at 1.25 million tons in 1986/87, 5 percent above last year, in order to curb rising consumer prices. Palm oil is expected to account for all of the decline in South Asia's imports in 1986/87, primarily because of large stocks in the region, particularly in Pakistan. Total palm oil imports are forecast to drop

about 30 percent to 1.2 million tons. Soybean oil purchases are forecast to rise almost 20 percent to 690,000 tons, with U.S. oil supplied through commercial and concessional programs accounting for about half of the total. *[Maurice R. Landes (202) 786-1614]*

Southeast Asia

Ample Food Grains in the Philippines

Good weather, lower fertilizer prices, and removal of wheat import controls resulted in abundant Philippine food grain supplies during 1986. Last year's record rice and corn harvests are expected to be surpassed in 1986/87 (July/June), as increases in area planted push rice output to 6 million tons and corn production to 4.1 million. Large stocks allow for the 133,000-ton payment-in-kind (plus interest) of a 1985 Indonesian rice loan, which is scheduled for shipment during January-May 1987. An uptrend in food grain consumption is expected, with wheat imports estimated to return to pre-1983 levels and top 1 million tons.

Thai Rice Output Down

Dry weather in 1986 is expected to reduce Thailand's 1987 rice crop 9 percent to 11.9 million tons. Even with a drawdown in stocks and lower nonfood use, 1987 rice exports are estimated to fall 14 percent below last year to a 4-year low of 3.7 million tons. A 20-percent boost in wheat imports and consumption is estimated during 1986/87 (July/June), with strong competition threatening to lower the U.S. share.

Indonesian Output To Rise Slightly

Despite receiving high priority, agricultural sector output will rise only slightly in 1987 because of an anticipated 1-percent decline in the dominant rice crop. Relatively modest output gains are expected for the major secondary food crops, except soybeans, which are forecast to rise 10 percent. An anticipated 7-percent gain for palm oil, a high priority crop for long term expansion, will pace gains for major estate crops, including rubber and tea.

The important 1987 wet-season rice crop is threatened by a serious outbreak of the brown plant hopper. In 1986, plant pests, including brown plant hoppers, are said to have destroyed over 200,000 tons of potential rice production, which contributed to a 2-percent drop in realized output. If brown plant hopper losses are well controlled in 1987, Indonesia might remain self-sufficient in rice if exports are reduced and carryover stocks are drawn down further. The longer-term rice self-sufficiency prospect is highly speculative because of the Government's 1985 termination of several production incentive programs, and planned phase-out of fertilizer subsidies.

Malaysian Palm Oil Output To Drop

Malaysian 1986/87 (October-September) palm oil output is forecast to decline 8 percent to 4.4 million tons. Prices, which eased recently and are still relatively low, are substantially above the extremely depressed levels of late 1986. As profits eroded in 1985/86, many palm oil producers applied inputs, including fertilizer, less intensively. This, and earlier drought in certain areas, are having lagged and depressing effects on palm oil output in 1986/87. Overall exports of palm oil may decline about 2 percent, and yearend stocks about 19. *[J. Albert Evans and Leslie E. Ross (202) 786-1614]*

Sub-Saharan Africa

Grain Production a Record

Grain production in Sub-Saharan Africa (excluding South Africa) reached a record in 1986, slightly above the one set the previous year. Total output, including wheat, rice, corn, sorghum, millet, barley, and teff, is estimated at 54 million tons--a 3-percent increase, following a 28-percent jump in 1985. Grain supplies from domestic production have improved dramatically since the droughts of 1983 and 1984, when the harvest was only 41 million tons.

The 1986 recovery was widespread and took place in almost every country from Mauritania to Zimbabwe. While 1986 production was down in a few countries, especially Senegal, gains in other countries were offsetting. Aggregate grain production in each of the last 2 years is more than 50 percent above the late 1960's; however, per capita output declined about 6 percent, from

131 kg to 123. While favorable weather contributed to the larger crops, other factors were also important.

In the early 1980's, producer prices for grain rose substantially due to both policy reforms and shortages. When the good rains came, farmers were anxious to respond, and area planted jumped 10 percent. The weather was mostly responsible for the 17-percent increase in yields. Few countries are actually using improved technology such as more fertilizer or new varieties. In fact, in some countries, fertilizer use is declining because policy reform packages have required governments to reduce subsidies. Even though most fertilizer in Sub-Saharan Africa is used on cash crops, there is often a residual effect on grains.

At least a quarter of Sub-Saharan countries harvested record grain crops in 1986. Among the countries making the largest gains in West Africa were Burkina and Nigeria. While weather was the major factor in Burkina, the Nigerian Government's grain import ban stimulated output.

In East Africa, both Kenya and Sudan had record harvests. In Sudan, output is estimated up 12 percent from last year's record, mainly because of expanded sorghum area in the modern rain-fed sector. Kenya's record can be attributed to a guaranteed producer price increase in real terms, larger area planted, increased use of fertilizer and improved seeds, and favorable weather. Both of these countries are important coarse grain producers. The gains in wheat and rice were much smaller.

Coarse Grains Recover Dramatically

Coarse grain production, which in 1984 was only slightly above the level of a decade earlier, recovered dramatically during the last 2 years. Total output of sorghum, millet, and corn was up more than one-third, to 43 million tons in 1985 and 1986, compared to the drought years. Per capita production of coarse grains, which are used mostly for human consumption in Sub-Saharan Africa, fell from 106 kg in the late 1960's to less than 80 kg in 1984. Even at the current record production levels, output on a per capita basis, at 100 kg, is still below the level of the late 1960's.

Millet/sorghum and corn are the main coarse grains, accounting for 53 and 44 percent of the total, respectively. Millet and sorghum--grown in lower rainfall regions--had the greatest response to the good weather. Output increased almost 40 percent during 1985 and 1986, compared to the 2 previous years.

Rice and Wheat Imports To Stay Large

Paddy rice and wheat production also rebounded sharply in 1985 and 1986, but these grains provide a much smaller share of total grain output. Paddy rice output of 7.3 million tons in 1986 was a record. The 1986 wheat harvest is estimated at 1.6 million tons. Together, these crops account for about 16 percent of total grains. Per capita output of rice and wheat has remained relatively constant since the late 1960's at about 16 and 4 kg, respectively.

The rising consumption of rice and wheat has been met by rising imports. Imported wheat now supplies about 80 percent of the total, compared to 60 percent in the late 1960's. The share of total use supplied by imported rice has more than doubled, from 17 to 35-40 percent during the same period. Many African governments are now faced with a dilemma--a coarse grain surplus and a rice and wheat shortage.

Now it is apparent that there are only limited substitution possibilities between wheat and rice and coarse grains. While total grain production increased more than 10 million tons in 1985, imports in the following year were down only 2.5 million. Most of this decline came in coarse grains, while imports of rice and wheat showed little change. Coarse grain imports have reached such a low level that any further decrease is unlikely. With 1987 rice and wheat imports estimated at 5.5 and 3 million tons, respectively, total grain imports are expected to stabilize at about 9 million tons annually until the next drought.

South Africa's Grain Output Up Slightly

South Africa's corn crop had a good start this season, but heat and dryness in the western areas in late January and into February, have dimmed the outlook. With little change in area, yields should be slightly above last year's, and the crop is estimated at

8.5 million tons. With consumption forecast to increase from last year's very low levels, corn exports for 1987/88 are expected to drop to 2.0–2.5 million tons.

White corn supplies remain tight and are not expected to be available for export. Last year, 200,000 tons were imported from Zimbabwe, whose stocks are near 2 million tons. However, Zimbabwe's corn crop is forecast down substantially, and stocks are likely to be drawn down to meet domestic requirements and export commitments.

Corn Price Reductions Proposed

Both South Africa and Zimbabwe are suffering financial losses in exporting corn. South Africa's producer price is about $108.50 a ton, and Zimbabwe's $110 a ton at current exchange rates. A recent South African sale was reported at $77 per ton, a substantial loss. For 1987, the South African Maize Board has proposed producer price cuts if there is a surplus for export. A 9-million-ton crop would result in a cut of nearly 20 percent.

Zimbabwe has a two-price system for large corn producers. For up to 50 percent of their 1986 base delivery, producers will be paid the same as in 1986, but for the balance, the payment will be approximately 44 percent less. A substantial reduction- possibly 40 percent--is expected by large-scale producers. *[Margaret Missiaen and Larry Witucki (202) 786-1680]*

WORLD TRADE AND FOOD POLICY

U.S. Compensation for EC Enlargement

The United States and the EC reached agreement on January 29 covering compensation for U.S. feed grain markets lost as a result of Spain's entry into the EC. The agreement provides for minimum annual purchases of 2 million tons of corn and 300,000 of sorghum by Spain from world supply sources between January 1, 1987, and December 31, 1990.

The EC will provide reduced-levy quotas to ensure these purchases or will purchase directly from world markets. The agreement also ends the requirement adopted during accession that Portugal reserve 15 percent of its feed grain purchases for EC suppliers, as well as extends previously bound tariffs to all EC-12 member states. This includes the extension of a bound zero tariff on imports of soybeans and corn gluten feed throughout the EC, although during the agreement period imports of nongrain feed ingredients (corn gluten feed, brewing dregs, and citrus peels and pellets) will be deducted from the 2.3-million-ton minimum annual purchase.

The agreement will provide further U.S. compensation, around $400 million, by lowering tariffs and providing additional access on imports of 26 agricultural and industrial products. Lower tariffs for these include: dried onions (from 16- to 10-percent tariff, up to 12,000 tons); avocados (from 8- to 4-percent tariff between December 1 and May 31); fodder plant seed, flower plant seed and kohlrabi, and vegetable plant seed (from 4-5 to 2.5, 6 to 3, and 6 to 4 percent, respectively); grapefruit and cranberry juice (from 15 to 12 and 22 to 14 percent, respectively); bourbon (50-percent tariff reduction); cigars (from 52 to 43 percent); and roasted nuts (from 16 to 12 percent in 1 kg packages or less). The EC tariff quota on coniferous plywood will also be raised 50,000 cubic meters--to 650,000--as part of the agreement, and lower tariffs will be levied on industrial items such as aluminum sheets, silicon wafers, and certain polyester and bromide chemicals.

The agreement averts the threat of U.S. retaliation on a range of imported European items.

Canadian Duty Levied on U.S. Corn

On March 6, Canada completed its countervailing duty investigation of U.S. corn exports to Canada, finalizing a levy of US$0.849 per bushel. The Import Tribunal of Canada completed the final phase of the investigation, brought July 2, 1986, by petition from the Ontario Corn Producers' Association. The petition alleged that U.S. Federal programs thought to be subsidies have resulted in suppressed prices and loss of market share, injuring Canadian corn farmers.

The Tribunal decision upheld the allegation of injury to Canadian corn farmers while Revenue Canada determined the countervailing duty. A preliminary

countervailing duty of US$1.048 per bushel was levied initially, but on February 2 was reduced to a final duty of US$0.849 per bushel of grain corn--which includes yellow and white corn, but excludes seed, sweet, and popping corn as well as all corn destined for the province of British Columbia.

Dairy Product Export Program Announced

The United States announced on February 4 the new Dairy Export Incentive Program to promote exports of U.S. dairy products by helping U.S. exporters meet subsidized competition. The Food Security Act of 1985 mandated the program through fiscal 1988. If successful, the program would significantly increase commercial exports of U.S. dairy products. The program targets 37 countries, with the criteria that sales must be additional, must target a specific market to challenge only competitors who overtly subsidize their exports, and must be cost effective. *[Ted Wilson and Mark Smith (202) 786-1688]*

COUNTRY BRIEFS

El Salvador's Economy Set Back 20 Years

A study by the Salvadorean Foundation for Economic and Social Development stated that the 7-year-old war, the Government's mishandling of the economy, and the steady disintegration of the Central American Common Market has set the country back 20 years. The report said that per capita income declined 32 percent between 1979 and 1985. Total agricultural production in 1986 was 22 percent below its 1978 record, and as low as in the early 1970's. This preceded the October 1986 earthquake, which, according to preliminary estimates, may have destroyed 35 percent of the country's infrastructure.

The report recommends sweeping reforms to revive the war-torn economy, such as a reduction in public spending, no more tax increases, and transfer of state-owned companies to private hands. President Duarte has a different approach to reviving the country. He submitted a bill to Congress introducing 14 new taxes, which he argues are necessary both to finance the war and to spread the tax burden more equitably. However, in a country where two-thirds of the budget is allocated to service the foreign debt and finance defense, it is very difficult to turn things around. *[Nydia Suarez (202) 786-1662]*

Jamaica May Import U.S. Dairy Cattle

The Jamaican Ministry of Agriculture recently announced a four-part program to increase milk production. The program provides U.S. exporters with an excellent opportunity to export high quality U.S. dairy cattle.

The genetic base of Jamaica's dairy herd has not changed in 40 years and there are increasing problems with inbreeding. As a result, milk production has been declining. Jamaica is looking for animals that will be compatible with the Jamaican Hope breed, which is a cross between the Brahman (for tropical tolerance) and the British Jersey (for milk production). Jamaica is interested in importing between 6,000 and 8,000 dairy cattle over the next 2 or 3 years. Jersey is the preferred breed, but Brown Swiss and Holsteins will be acceptable to some Jamaican importers. *[Dick Brown (202) 786-1664]*

Australia Announces 1986/87 Wheat Price

Australia set the final guaranteed minimum price (GMP) for Australian Standard White wheat at A$139.83 (U.S.$94) per ton, 7 percent below 1985/86. GMP's for other classes range from A$105.77 for feed wheat to A$156.62 for prime hard. Producers receive the GMP less handling, storage, and freight charges. This year, it is the only payment most producers will receive. Farm prices may decline 14 percent to about U.S.$68 a ton.

The GMP is A$9 above the preliminary GMP announced last September, and well above industry expectations. The Government of Australia will be required to make a substantial payout--around A$20 a ton--to fulfill its underwriting obligation to support the GMP; it will be the first payout since 1972/73.

The GMP is set according to a formula that uses gross pool returns from the prior three crops (eliminating the highest), forecast returns for the current crop, and forecast costs for the current pool. As the Government appears willing to provide generous support to the wheat industry, the announced GMP appears to be based on an optimistically high

estimate for 1986/87 export prices. Depressed wheat and other commodity prices have reduced real net farm income in Australia by 44 percent from the 1980/81 level. The GMP will support income and also provide an immediate cash influx as producers receive checks for the difference between the GMP and the initial (delivery) payment (90 percent of the preliminary GMP). *[Sally B. Byrne (202) 786-1611]*

South Africa's Grain Consumption Drops

The droughts of 1983-84, and generally low economic growth since 1981, have had a major impact not only on grain production and producers, but also on grain consumption and nutrition. In 1983 and 1984, corn yields were very low. In 1983, the Government raised the producer corn price 25.4 percent, and in 1984 28 percent. But with sales of yellow corn for feed estimated down to only 3 million tons during 1986/87, the Maize Board reduced the price an average 8 percent to R288 per ton, or $138 (1R = $0.48), effective January 1987. The Board stated that the future for corn "lies in the internal market and that special attention needs to be given to this market." Buyers of yellow corn agreed to buy more if the price was reduced. This is the first price reduction in 20 years.

Per capita consumption of total grains for food has dropped about 18 percent to 171 kg since the late 1970's, and about 19 percent in use for feed to 108 kg. Per capita corn consumption for food has dropped about 30 percent to only 92 kg, and use of corn for feed now slightly exceeds use for food. Total per capita use of corn is down about 24 percent since the early 1980's. If corn use today were at the previous higher levels, there would be little available for export.

Per capita use of sorghum for food is dropping steadily, but use for feed is up sharply. High corn prices have encouraged feed use of sorghum. Per capita consumption of wheat for food continues to increase slightly, while that of rice is increasing rapidly from a low base. *[Larry Witucki (202) 786-1680]*

Turkey Harvests Record Grain Crop

Turkey's 1986 wheat crop was a record 14 million tons according to USDA estimates, a figure considerably below the Turkish Government's 19-million-ton estimate. The differences in these data dating back to the late 1940's involve discrepancies in area and yield estimates. While wheat area increased 1 percent, yields were the highest ever, up 9 percent from 1985. The higher yields came from improved cultivation practices, including use of better seed, increased use of fertilizer and pesticides, and very good and timely rain.

Turkey had expected to export as much as one-half million tons of wheat, but the estimate has dropped sharply, a function of demand rather than supply. Exports to Iraq are down, as Iraq is substantially in arrears in its trade balance with Turkey because of lower oil prices and reduced Turkish demand. Iran had a good grain crop, and while its grain imports are down, it is getting a better price from Australia and Argentina. And third, the competition for the Middle East-North African market is keen, and Turkey is only one of many players.

Despite the record crop, Turkey continues to import wheat. The wheat price offered by the United States under EEP is very attractive. A recent 100,000-ton purchase was made at $64 per ton. The imported wheat is being blended with lower quality domestic wheat from Thrace.

Turkey's feed grain output also rose sharply, with a record 2.3-million-ton corn crop. For some years now, Turkey has attempted to increase output, but only in the last 3 years have results been visible, primarily with the use of hybrid seed. The barley crop was a near record 6.3 million tons. *[Michael E. Kurtzig (202) 786-1680]*

U.S. Poultry Product Exports to Iraq Up

Recent credit approvals indicate U.S. exports of poultry products to Iraq could exceed $80 million in 1987. Iraq has already purchased over half of the 60,000 tons of frozen poultry available through EEP. U.S. sales revived recently with $10 million of GSM-102 credit for poultry meat. Reduced imports caused shortages of mutton and canned meat, which contributed to greater demand for poultry meat in late 1986.

Dwindling deliveries from other suppliers and greater-than-expected pockets of

shortage led to the quick use of the U.S. credit. Total Iraqi imports of frozen poultry declined from 170,000 tons in 1981 to about 75,000 in 1985. Brazil is the preferred supplier because of attractive prices and countertrade arrangements. However, Brazil's recent drought and inflation hampered deliveries in 1986. Because of payments problems the EC has also reduced deliveries of frozen poultry and eggs to Iraq. EC shipments of poultry meat declined from 7,538 tons in 1982 to only 325 in 1985. GSM-102 credit has been approved for $29.8 million for egg sales to Iraq.

Returning to the United States as a major egg supplier will not only reduce shortages, but diversify import sources. Over 85 percent of Iraq's 1983-86 egg imports came from Turkey, where Iraq is in arrears for payments, hampering future negotiations. The shortage of other foods and snacks, as well as increased urbanization, contributed to a booming demand for eggs that is unlikely to subside. *[John B. Parker (202) 786-1680]*

WORLD FOOD OUTPUT ROSE SLIGHTLY

Charles E. Goode
International Economics Division
(202) 786-1625

Abstract: World food output during 1986 increased less than 1 percent from the 1985 record. The slower growth resulted primarily from the 5-percent decline in the United States. Food output increased in Canada, the Middle East, North Africa, Southeast Asia, China, South Asia, Sub-Saharan Africa, and the USSR, and declined in Latin America, East Asia (excluding Japan and China), and most of the developed countries. Over the past decade, food production has barely kept pace with population growth. Per capita food output fell in Sub-Saharan Africa and Latin America in 1986.

Keywords: Food output, output indexes, per capita indexes, population, Africa, Latin America, Asia, Europe, developed, developing, centrally planned, and world.

Factors Affecting Food Output

World food output gained slightly in 1986 because of larger output of wheat, rice, barley, corn, soybeans, and meat. The increase was 1 percent below the 1977-1986 trend of 2 percent. Given world population growth of 1.6 percent in 1986, the slight increase in food output was not enough to prevent global per capita food availabilities from falling almost 2 percent. While much of the drop in output was concentrated in the developed countries (United States, Western Europe, Japan, and Oceania), several countries in the developing regions, primarily in Latin America, suffered major declines.

Food output in the USSR and China was up in 1986 from the previous year, but declined 5 percent in the United States. U.S. crops were reduced by the Southeastern drought, hot humid temperatures, lower yields, and greater participation in acreage reduction programs. Bad weather during the growing season reduced food output in Western Europe almost 2 percent from 1985. France, the region's largest food producer, had a 4-percent decline as a result of smaller wheat, corn, and barley crops.

Most other regions, except Latin America, and East Asia (excluding Japan and China) increased or stabilized food output in

World indices of food production

Country or region	1981	1982	1983	1984	1985	1986 1/	1986/1985	Growth rates 2/ 1950-86	Growth rates 2/ 1977-86
				1976-78 = 100				Percent	
Developed	108	110	103	113	114	112	-1.8	1.8	1.2
United States	113	114	94	110	117	111	-5.1	2.1	.9
Canada	113	119	113	110	120	132	10.0	2.1	2.7
Japan	92	94	94	100	101	100	-1.0	.6	-.2
Rep. S. Africa	121	107	93	101	109	110	.9	3.2	.3
Oceania	105	95	116	113	112	110	-1.8	2.7	1.5
Western Europe	110	113	111	119	116	114	-1.7	1.9	1.5
Developing	112	114	116	121	125	128	2.4	3.0	2.7
Latin America	115	114	116	121	125	128	2.4	3.0	2.7
East Asia 3/	101	103	105	109	111	110	-.9	3.6	1.1
S.E. Asia	125	128	132	139	143	148	3.5	3.6	4.6
South Asia	111	108	122	123	124	127	2.4	2.6	2.9
Middle East	105	114	114	118	123	134	8.9	3.2	3.1
North Africa	104	115	114	117	127	133	4.7	2.3	3.3
Sub-Sahara 4/	111	113	106	110	117	119	1.7	2.1	1.7
Centrally planned	102	109	114	119	117	119	1.7	2.7	2.1
USSR	91	98	102	102	101	102	1.0	2.7	.5
Eastern Europe	102	105	104	112	108	109	.9	2.3	1.1
China	124	136	146	156	157	161	2.5	3.3	5.7
World	107	111	111	117	118	119	.8	2.4	2.0

1/ Preliminary. 2/ Annual compound growth rates computed by least squares method. 3/ Excludes Japan and China. 4/ Excludes Republic of South Africa.

1986. Food output in Sub-Saharan Africa increased only 1.7 percent, compared with 6 percent in 1985. The effects, however, of grasshopper and locust infestations on grain crops in many African countries in 1986 have been minor, but remain a threat to 1987 crops. Ethiopia, still very low in per capita food supplies, produced only 2 percent more food in 1986 than in 1985 but was still 6 percent above 1984's low levels. However, Algeria and Tunisia had lower wheat and barley crops in 1986, reducing North African food output growth to 5 percent. This was, however, below the 9-percent gain in 1985, when Tunisia produced record crops.

Developing Countries Advanced

During 1977-86, food output increased 2.7 percent annually in the developing countries, 1.2 in the developed, and 2.1 in the centrally planned countries. Food output in the developing countries responded to good weather and improved farming methods as well as high-yielding grains adopted during the Green Revolution. However, output in some countries declined because of severe droughts, lower yields, farm debt, higher inflation, and civil strife.

Although food production grew 2.6 percent annually in Latin America over the last 10 years, output in 1986 declined 1.6 percent because of the drought in the Pacific Coast region of Central America. Due to larger grain production, Brazil's food output nearly equaled the 1985 record. In Argentina, smaller corn and sorghum crops and a rebound in wheat output held food output near the 1985 low level. Argentina has shifted some grain area to oilseed crops because of a relative price advantage.

Over the past 10 years, food output growth in the developing countries of Southeast Asia was nearly 5 percent, second only to China, and last year's growth rate was the fourth highest in all regions. Increased production of rice, wheat, and livestock products accounted for much of the gain. In South Asia, India and Bangladesh, two of the largest food producers, gained nearly 2 percent each in 1986.

Slower growth in food output in developed countries over the past 10 years was partly due to the accumulation of agricultural surpluses, which in some cases led to restrictions on production. However, while the sharpest 1986 decline was in the United States (5.1 percent), smaller decreases were noted for Australia (2.7 percent) and for Japan (1.0 percent). Canada's larger grain crops increased overall food output for the second consecutive year.

Per Capita Output Plateaued

Although world food output has grown 2.0 percent annually over the last 10 years, population rose 1.7 percent. Consequently, food output per capita grew only 0.3 percent from 1977 to 1986. Per capita food output during 1986 was up over 3 percent from 10 years ago, but was about 2 percent less than 1984's record high. Over the past decade, increased supplies of food and fiber have barely kept pace with the growing population and have reached a plateau. Few developing countries however, are self-sufficient in food and fiber production and are therefore dependent on imports for supplemental supplies.

Africa was among regions experiencing the largest declines in per capita food output since 1977. Although a few countries had slight gains, Africa experienced a 1.1-percent decline in per capita food output in 1986. About 80 percent of the African people are in countries where food output is growing slower than the 2.9-percent increase in population. Despite the recovery from past severe droughts in Sub-Saharan Africa, per capita food output declined about 1.2 percent annually from 1977 to 1986. In some countries, such as Senegal, Zimbabwe, Burkina (FASO), and Kenya, food output per person fell 20, 10, 8, and 8 percent, respectively. However, in larger populated countries, such as Nigeria and Ghana, per capita food output has shown substantial improvement since 1984's low levels.

China, with over 21 percent of the world's population, has made the largest gains in per

World indices of per capita food production

Country or region	1981	1982	1983	1984	1985	1986 1/	1986/1985	Growth rates 2/ 1950-86	Growth rates 2/ 1977-86
				1976-78 = 100			Percent		
Developed	105	106	99	107	108	105	-2.8	0.8	0.5
United States	108	108	89	102	108	102	-5.6	.9	-.1
Canada	108	112	106	102	110	120	9.1	.5	1.7
Japan	89	91	90	95	96	94	-2.1	-.4	-.9
Rep. S. Africa	110	95	80	86	90	88	-2.2	.6	-2.2
Oceania	100	89	108	104	102	99	-2.9	.9	.3
Western Europe	108	111	109	117	113	112	-.9	1.3	1.3
Developing	102	101	101	102	104	103	-1.0	.6	.4
Latin America	105	104	99	103	105	101	-3.8	.8	.2
East Asia 3/	95	95	96	98	98	95	-3.1	1.3	-.4
S.E. Asia	114	114	116	119	120	122	1.7	1.2	2.5
South Asia	101	96	107	105	104	104	0	.4	.7
Middle East	94	99	97	97	99	105	6.1	.5	.4
North Africa	93	99	95	96	101	102	1.0	-.2	.4
Sub-Sahara 4/	100	98	89	90	93	92	-1.1	-.5	-1.2
Centrally planned	98	103	107	110	108	109	.9	1.1	1.2
USSR	88	94	97	96	94	95	1.1	1.5	-.4
Eastern Europe	99	102	100	108	104	104	0	1.5	.7
China	118	127	136	143	143	146	2.1	1.4	4.6
World	100	102	100	104	104	102	1.9	.5	.3

1/ Preliminary. 2/ Annual compound growth rates computed by least squares method. 3/ Excludes Japan and China. 4/ Excludes Republic of South Africa.

capita food output since 1977. Food output per capita increased an average of 4.6 percent annually, with most of the gains coming in the last 8 years. The Government's birth control policy put the brakes on China's runaway population growth by instituting an aggressive one-child-per-family planning program more than a decade ago. According to the Census Bureau's midyear population report, China's annual birth rate declined from 1.4 percent in 1977 to only 0.8 percent in 1986. The declining population growth and the high rate of food output have provided China with a more abundant per capita food supply, and raised the centrally planned group to the top in per capita food gains in 1986.

Population growth over the past decade was among the highest in Southeast and South Asia. Food output increased, but not as fast. The Southeast Asian countries have collectively raised their per capita food output 2.5 percent since 1977. With 21 percent of the world's population, South Asia's per capita food output increased at an annual rate of only 0.7 percent since 1977. The South Asian region had a 2.3-percent rise in population in 1986, unchanged from 1985.

Offsetting the increases in the Far East region, per capita food output declined in Japan, primarily from a slowdown in paddy rice production. For South Korea, increased livestock products pushed per capita food output up 2 percent in 1986, compared with a 1.8-percent increase in 1985. In Taiwan, with a per capita income of $3,000, cutbacks in paddy rice production pushed per capita food output down 5 percent in 1986. However, gains in annual livestock production in East Asia have slowed in the 1980's with declining growth in Japan offsetting steady growth in Taiwan and South Korea.

Food Grains, Meat, and Oilseeds Gaining

World food grain output rose 3 percent annually from 1976 to 1985 and in 1986 constituted nearly one-third of total food output. The United States, China, the USSR, and India produced almost one-half of all food grains in 1986. About 80 percent of the food grains produced during 1986 was wheat (29 percent), corn (26 percent), and rice (25 percent). The United States leads in corn production, the USSR in wheat, China and India in paddy rice.

Meat accounted for about one-fourth of average world food output from 1977 to 1986, and production grew 2 percent annually. The developing countries are increasing their output of meat, milk, and eggs at a faster rate than either the centrally planned or developed countries. But with 53 percent of the world's population, the developing countries produce less than one-fifth of all livestock products. A key factor underlying the 10-year-trend gain for meat is that most Asian and Central American countries have developed and expanded their livestock production systems by feeding more coarse grains. The demand for coarse grains has been increasing faster than production and, as a result, some developing countries have shifted from net exporters of coarse grains to net importers.

Oilseed output rose 4.5 percent annually the past 10 years, with most of the rise coming in soybeans. The United States led with an output of 55 million tons in 1986, 7 million more than 10 years ago, followed by a 4.3-million-ton increase in Brazil. China, the third largest producer, had estimated production of 11 million tons in 1986, up 3.6 million for the decade.

Pulses, roots, and tubers continue to provide the basic food supply in many developing countries, but these subsistence crops are showing little or no increase in absolute levels of production. The higher growth of other foods, such as food cereals, livestock products, oilseeds, fresh fruits, vegetables, and even refined sugar, indicates a shift in consumer demand to high-valued food crops in some developing countries.

WORLD FOOD AID NEEDS DECLINING

Ray Nightingale
International Economics Division
(202) 786-1705

Abstract: In the last few years the world has moved away from the specter of famine. The assessed 1986/87 cereal aid needs of 69 countries to maintain current availability (the status quo) is 6.7 million tons: 4 million in Africa, 1.4 million in Asia, 650,000 in the Middle East, and 477,000 in Latin America. Status quo aid needs are down 2.1 million tons from 1985/86 and 5 million tons from 1984/85. Of the 16.4 million tons in nutrition-based aid needs, an estimated 13.5 million can be absorbed by the recipient countries. The FAO expects world cereal aid availability to be 10.8 million tons in 1986/87.

Keywords: Food needs, food availability.

The global food situation has changed dramatically in the last few years. Many countries have moved away from the specter of famine. In virtually all developed countries, agricultural prices have plummeted under the weight of supplies. For the present, relatively few developing countries face large food deficits.

The Economic Research Service (ERS) prepares quarterly reports on the quantities and dollar values of assessed extra-commercial food needs---those exceeding estimated capacity to undertake commercial imports of cereals, pulses, vegetable oils, and dairy products. These assessed aid needs represent national food deficits resulting from agricultural and general economic failure, not food aid that the United States or other donors are necessarily prepared to provide.

Two measures of food aid need are regularly applied to test the adequacy of food supplies. The status quo assessment measures the cereals needed just to maintain recent national per capita availability. The estimated national availability is the average of the 4 most recent years not representing extreme supply situations. The nutrition-based assessment is a measure of the need for cereals to meet minimum per capita nutritional requirements. It is the additional food needed to close the gap between per capita food availability and an internationally accepted minimum national standard. These are reported for 1986/87 and 1987/88 in *World Food Needs and Availabilities, 1986/87*, and supplements.

Cereal Needs Recede in 1986/87

Status quo cereal shortfalls for 1986/87 in 69 developing countries are estimated at 6.7 million tons. In Sub-Saharan Africa, status quo cereal aid needs are placed at 1.5 million tons. The largest shortfalls continue to be in Southern Africa at 510,000 tons, and in East Africa, where Ethiopia requires 356,000 of the 583,000-ton total. Needs in West Africa are estimated at 278,000 tons. Status quo needs in Asia are 1.4 million tons for 1986/87. South Asia dominates with Bangladesh having needs of 478,000 tons and Nepal 214,000. Latin American status quo requirements are assessed at 477,000 tons.

The 69 countries are estimated to be short 16.4 million tons of cereals to meet minimum nutritional standards in 1986/87. Nutritional aid needs are greatest in South Asia at 7.2 million tons and East Africa at 4 million tons. Maximum absorbable import capacities of 3.4 and 2.7 million tons, respectively, are estimated as the constraint on nutrition-based cereal imports imposed by limited storage facilities and internal transportation systems in these regions.

When requirements for maintaining cereal stock levels are added to needs for consumption, status quo aid needs total 7.9

Cereal needs for consumption, stocks adjustments, and maximum absorbable needs

Region	Consumption 1984/85 1/	Consumption 1985/86	Consumption 1986/87	Change 84/85-85/86	Change 85/86-86/87	Consumption & stocks 1986/87	Maximum absorbable 1986/87
			Thousand metric tons				
Status quo							
Africa	7779	5549	4150	-2230	-1399	5137	
North	2998	2511	2623	-487	112	3382	
Sub-Sahara	4781	3038	1527	-1743	-1511	1755	
Central	269	233	156	-36	-77	167	
East	1642	1650	583	8	-1067	722	
West	1560	377	278	-1183	-99	356	
South	1310	778	510	-532	-268	510	
Middle East	237	773	650	536	-123	738	
Asia	2310	1952	1416	-358	-536	1438	
South	748	1752	1284	1004	-468	1306	
Southeast	1562	200	132	-1362	-68	132	
Latin America	1419	537	477	-882	-60	605	
Caribbean	271	337	89	66	-248	142	
Central America	362	200	379	-162	179	444	
South America	786	0	9	-786	9	19	
Total	11745	8811	6693	-2934	-2118	7918	
Nutrition-based							
Africa	11407	7993	7465	-2414	-528	7972	8304
North	0	0	0	0	0	0	3382
Sub-Sahara	10407	7993	7465	-2414	-528	7972	4922
Central	1135	283	312	-852	29	324	324
East	3893	4757	3992	864	-765	4258	2657
West	3209	1210	1417	-1999	207	1501	804
South	2170	1743	1744	-427	1	1889	1137
Middle East	261	645	473	384	-172	562	562
Asia	12937	10748	7564	-2189	-3184	7680	3692
South	10377	9910	7247	-467	-2663	7363	3375
Southeast	2560	838	317	-1722	-521	317	317
Latin America	2162	868	946	-1294	78	1079	963
Caribbean	485	382	167	-103	-215	196	184
Central America	449	330	564	-119	234	640	622
South America	1228	156	215	-1072	59	243	157
Total	25767	20254	16448	-5513	-3806	17293	13521

1/ The larger 1984/85 needs generally stem from lower cereal production and poorer financial status. For some countries the 1984/85 analysis included debt payments that were higher than current estimates of rescheduled payments. Also, a change in the post 1984/85 estimation of base period consumption increased Sub-Saharan while reducing Asian estimates.

million and nutrition-based needs total 17.3 million tons. North Africa has the greatest status quo stock needs.

Regional Needs Change Since 1984/85

While world food deficits have declined, there continue to be year-by-year differences in the experience of particular regions. And these changes are dissimilar for status quo and nutrition-based needs.

The assessed status quo cereal aid needs for 1986/87 are 2.1 million below estimated needs for 1985/86, and 5 million below 1984/85. The largest decreases are in East Africa, South Asia, and the Caribbean. In 1985/86, decreases were greatest in West and Southern Africa, Southeast Asia, and South America. Needs increased in 1985/86 in the Middle East with a further deterioration of the situation in Lebanon. Needs increased in Central America, another locus of civil conflict, in 1985/86 and continued to rise in 1986/87. After a sharp rise in 1985/86, cereal needs declined again in South Asia, as cereal production improved in Pakistan.

The assessed global nutrition-based cereal aid needs for 1986/87 are 3.8 million tons below those needs for 1985/86, and 9.3 million below 1984/85. The largest decreases in

1986/87 are in East Africa and South and Southeast Asia. Cereal needs increased in West Africa and Central America. In 1985/86, decreases were greatest in West Africa, Southeast Asia, and South America. Increases were registered in East Africa and the Middle East.

Nutrition-based aid needs are affected by changes in population, production, and the factors governing commercial import capacity. Status quo needs are moved by these factors and also by the per capita levels of food availability in recent years. Countries that have achieved high levels of consumption through commercial food imports, such as Lebanon, or through food assistance, such as Egypt, have large status quo food needs, but little or no nutrition-based needs. Status quo needs are reduced as countries move out of shortage periods, while nutrition-based needs in these countries may continue to grow. Donor countries with limited food aid budgets might focus on hunger by assisting countries with nutrition-based needs.

The continued decline in status quo food aid needs as the food situation improves or stabilizes in Africa means emergency or disaster assistance is less likely to be needed. International assistance might be used to address local production problems, financial difficulties which reduce commercial import capacity, and constraints on household food purchasing capacity. Even in countries without assessed nutritional needs on an aggregate national level, many people need help to achieve food consumption adequate for health and the energy to be productive. The large variance in family incomes in the poorer countries leaves many households with inadequate means to purchase food while more fortunate segments of the population are abundantly fed.

The implications of food aid needs assessments are quite specific to individual countries because of the variety of factors entering into the assessment. Deficits in food availability may be addressed through food assistance, or through financial and trade adjustments.

Food needs and availabilities reports provide information to facilitate the interpretation of assessments and discussions of current changes in food needs of individual countries. The information includes an analysis of the per capita status quo and nutrition-based needs which provides a measure of the relative severity of food needs across countries. Per capita calculations are adjusted to compensate for the different proportions of the diet made up by the staples analyzed in the food needs assessments. Differences among per capita measures reflect differences in the severity of food problems among countries and the manner in which the problems have been addressed. The following country examples also reflect disparity between the status quo and nutrition-based results inherent in the different methods of assessment.

Currently, Cape Verde in West Africa, Haiti, and Lebanon rank high in both status quo and nutrition-based per capita food aid needs. Generally, this means that food availability has in the recent past been sustained near the level needed to achieve minimum recommended diets, either by commercial imports that are no longer affordable, or by food aid. Cape Verde, Chad, and Haiti have long been recipients of food aid. Lebanon increasingly lacks commercial import capacity.

Burundi and Somalia in East Africa, Mali in West Africa, and Comoros off Southern Africa have per capita nutrition-based aid needs much higher than status quo needs. This wide margin indicates a serious gap between recent food intake levels and the supplies needed to meet recommended caloric levels. This gap has not been filled in the recent past by commercial imports, or by food aid.

Egypt, Nicaragua, and Tunisia have per capita status quo aid needs much higher than nutrition-based needs. In these countries, domestic production, commercial imports, or food aid donations have pushed per capita intake levels close to or above the nutritional minimum. Food assistance to these countries using the status quo estimates would support consumption above minimum levels.

Food Aid Availabilities and Outlook

The Food and Agriculture Organization (FAO) expects world cereal aid donations in the July 1986-June 1987 trade year to be about 10.8 million tons. This is a very slight decline from 1985/86, but is more than 10

percent below peak levels achieved in response to the African famine. The United States, the European Community (EC), Canada, and Australia are principal donors.

At the end of September 1986, pledges to the UN/FAO World Food Program for the 1987–88 biennium were almost $625 million against a target of $1.4 billion. Pledges to the 1985–86 biennium were about $1.1 billion against a $1.35–billion target.

As of October 1986, cereal contributions of about 540,000 tons to the 1986 International Emergency Food Reserve (IEFR) again surpassed the 500,000–ton target. The principal donor was the United States (270,000 tons), followed distantly by Australia (50,000), the EC (40,000), and Sweden (40,000). The IEFR, administered by the World Food Program, was established in 1975 by the United Nations to ensure resources to help meet food emergencies. In 1984 and 1985, about 120,000 and 190,000 tons of cereals, respectively, were channeled specifically for the African famine. Significant amounts of commodities are also channeled for Afghan refugees.

Assessments of total status quo and nutrition–based aid needs for 1987/88 are 5.8 and 13.7 million tons, down from 1986/87 by 900,000 and 2.7 million tons. The United States has proposed a fiscal 1988 budget in which the volume of Public Law (P.L.) 480 food aid would decline about 5 percent to 7.8 million tons. The actual P.L. 480 budget will depend on Congressional action.

THE GREEN REVOLUTION LAGS RISING WHEAT CONSUMPTION IN THE DEVELOPING WORLD

Gary Vocke
International Economics Division
(202) 786–1705

Abstract: Wheat imports by developing countries have doubled since the early 1960's even though wheat output in the developing world rose more than 150 percent. Most countries of the developing world have become more dependent on wheat imports to meet rising demands. The Green Revolution has allowed some wheat importing countries to achieve self–sufficiency.

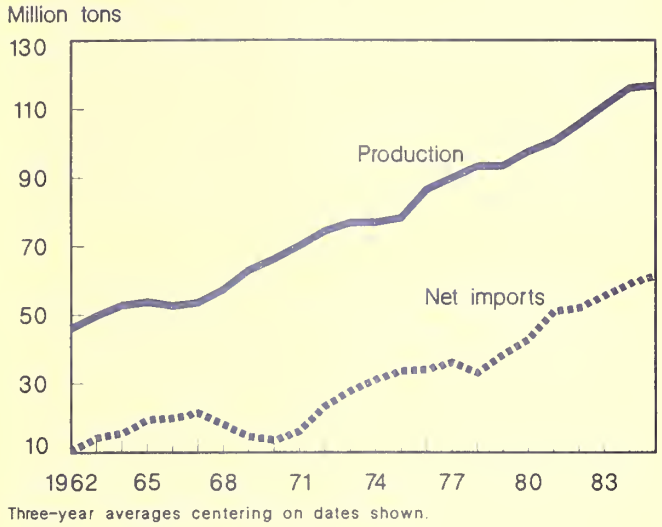
Keywords: Green Revolution, wheat, developing countries, agricultural policy, high–yielding varieties.

Wheat consumption is increasing throughout the developing world with rising incomes and urbanization. Per capita consumption of wheat is growing faster than per capita production, reflecting an increasing dependency on rising wheat imports. The Green Revolution, however, has increased wheat output greatly in the traditional, spring–wheat growing countries, reducing and in some cases eliminating imports. Because wheat is not well suited for tropical climates, the Green Revolution has not significantly increased wheat output in these areas. Demand for wheat products, however, continues to increase in the tropics. To a large extent, the rising demand in the tropics has been met with imports. This is why wheat imports by the developing countries have grown 100 percent since the early 1960's even though wheat output in the developing world rose more than 150 percent.

Wheat Consumption Increases in LDC's

Rising incomes and increasing urbanization explain much of the increasing

LDC Wheat Production and Net Imports Rise



per capita wheat consumption in developing countries (LDC's) (4). 1/ Consumption is usually higher in urban areas than in rural areas so the migration to the cities is increasing the demand for wheat. Wheat consumption in developing countries also tends to rise with incomes, usually at a faster rate than for other staples. The direct association between increasing wheat consumption and rising incomes also reflects considerable substitution of wheat for other starchy staples. Furthermore, as economic development and urbanization proceed, sales of wheat flour decline and sales of processed products, such as bread, increase. Among the lower-income, wheat-consuming countries, over 90 percent of the milled wheat is bought as flour for home baking and cooking (5). As per capita income increases, wheat products baked outside the home replace flour as urban people are more willing to pay extra for foods requiring little preparation. Rapidly increasing wheat consumption has led to greatly increased wheat imports in developing countries where wheat is not a suitable crop.

Where rising demand for wheat has exceeded domestic output, many countries have turned to imports. Imports for urban consumers help overcome domestic problems such as bottlenecks in domestic transportation, limited rural storage, year-to-year fluctuations in supplies, and problems of quality control, especially with other grains such as sorghum. In Sub-Saharan Africa, for example, population in the major capitals is growing at an average annual rate of 9 percent (5). If these cities were to depend on domestic supplies, internal transportation and storage capacity would have to double every 8 years simply to maintain per capita consumption. Thus, many developing countries find it easier to import wheat than to supply their cities with food from rural areas. Consequently, Sub-Saharan Africa has one of the highest growth rates of imported wheat consumption.

Food aid, usually wheat, has helped increase consumer preferences for wheat products. In addition, food products from imported wheat are often less expensive than products from other grains because of government policies.

A few countries have met their rising demand for wheat with dramatic increases in domestic output, the Green Revolution for wheat. In other countries, particularly the tropics where little wheat is grown, increased consumption has been supplied by ever larger imports.

Wheat Green Revolution Starts In Mexico

The Green Revolution for wheat refers to the dramatic gains in crop productivity that came from replacing traditional wheat varieties with semi-dwarf varieties, increasing the use of inputs, and improving management. The research that created semi-dwarf varieties began as a cooperative venture between Mexico and the Rockefeller Foundation at what is now called CIMMYT (International Maize and Wheat Improvement Center). Researchers developed short-stemmed, high-yielding wheat varieties in the 1950's by crossing rust-resistant Mexican varieties with American semi-dwarf varieties (developed in the 1940's at Washington State University using varieties from Japan). By the 1960's, the Mexican and American varieties had been successfully crossed and the seed distributed to farmers, greatly increasing Mexican wheat yields through the 1970's.

The semi-dwarf varieties proved well adapted to the wheat-growing regions of many

1/ Numbers in parentheses refer to sources listed at the end of the article.

developing countries. India and Pakistan began importing seed for commercial planting from Mexico in 1965; Turkey, in 1967. When grown using recommended practices, including irrigation and fertilization, the semi-dwarf varieties increased yields two and three times those of native varieties. The rapid expansion of the area planted to semi-dwarf varieties during the 1960's started the Green Revolution and has steadily increased production in the wheat-producing countries of the developing world.

The semi-dwarf varieties used more fertilizer, water, and pesticides to substitute for land expansion as the primary basis for increased output. Before the Green Revolution, production increases were due more to expanded areas than to higher yields. By the end of the 1960's, yields were improving rapidly and were making the larger contribution. By the 1980's, most of the increase in output was due to yield increases (12).

The major wheat-growing areas of the developing world have nearly completed the switch to semi-dwarf varieties (6). Mexico, India, Pakistan, Turkey, and Argentina now have 84 percent of the total area planted to semi-dwarf varieties in the non-Communist, developing world (7). The spread of these varieties was typically associated with important policy changes. Farm prices were raised, fertilizer manufacture and distribution stepped up, and seed production improved. Other important changes occurred too. For example, in India the profitability of the high yielding semi-dwarf varieties financed wells to shift lands from rain-fed crops, such as coarse grains, oilseeds, and pulses, into irrigated wheat production. As increasing production eliminated the need for imports,

Estimated area planted to HYV wheat, 1982/83

Country	HYV area	HYV share of	
		Country's wheat area	LDC HYV area
	Mil. ha	Percent	
India	18.1	79	43
Argentina	6.5	92	16
Pakistan	6.4	88	15
Turkey	3.3	36	8
Mexico	.8	80	2
Total	35.1	74	84

Source: (7).

some countries, such as Mexico in the late 1960's, sometimes reduced their incentives to wheat farmers to avoid subsidized surpluses, which would have to be exported in competition with the traditional wheat exporters (12). Except for Argentina, these major wheat-producing developing countries generally are concerned with national self-sufficiency and thus are not expected to become significant exporters (12).

The key elements of the Green Revolutions in Mexico, India, and Pakistan were semi-dwarf varieties, irrigation, and increased fertilizer use. Mexico briefly became a net exporter during the 1960's, but began importing again on a large scale after 1970 because consumption was increasing faster than production. Today, Mexico is self-sufficient in food wheat and imports only feed quality wheat. Increased wheat output in India and Pakistan allowed imports to trend downward in sharp contrast with the general trend for developing countries. These two countries, which were once the major importers in the developing world, now fluctuate around self-sufficiency.

Turkey's Green Revolution in wheat was initially limited to the irrigated, spring wheat regions on the coast because the Mexican semi-dwarf varieties were spring wheats. The Green Revolution was later extended to the dryland, winter wheat regions with the development of improved management practices and suitable varieties from Russia and the United States. The increased output allowed Turkey to become a wheat exporter for several years. Recently, however, production slowed and the country is fluctuating between self-sufficiency and being a net importer.

Argentina's wheat yields did not rise as rapidly as elsewhere because the government's industrial development strategy kept wheat prices low and fertilizer prices high, thus discouraging fertilizer use. Argentina nevertheless increased wheat yields and output by adopting semi-dwarf varieties and improved tillage practices.

Wheat Production Constrained In Tropics

Wheat production on a large scale in tropical countries is presently limited by the

adverse effects of high temperatures and sometimes unfavorable rainfall and soils. Tropics here are defined as the area between 23 degrees N and 23 degrees S latitude and include Sub-Saharan Africa, Southeast Asia, Central America and the Caribbean (less Mexico), Brazil, and the Andean area. This group of countries has a population of about 1 billion, roughly equally divided among Africa, Asia, and Latin America (2).

Below 1,000 meters elevation in the tropics, very little commercial wheat production occurs, except in the Sudan. (Most of Brazil's wheat is now grown south of 23 degrees S latitude, but future expansion will likely be only in the more tropical zones (2).) The tropics range from humid climates, where wheat can sometimes be grown in the cooler dry season, to the arid regions in Sub-Saharan Africa. Despite the difficulties of growing wheat in these environments, many countries have research and development projects for wheat because of their rapidly growing total wheat consumption--4.2 percent annually in tropical Africa and Asia and 1.6 in tropical Latin America since the early 1960's. These countries import about one-third of all wheat imported by developing countries. Imports provide more than 80 percent of their wheat consumption (2).

Rice Paddies Can Be Used for Wheat

Millions of hectares of rice paddy land in Asia lie idle during the cooler dry season. Wheat research for this idle land focuses on breeding suitable varieties, developing multiple cropping patterns, and exploring soil management practices, including the effects on wheat of the hardpans that result from puddling the soil for rice (3, 9). Bangladesh is an example where wheat production is being successfully introduced. Wheat area rose from an average 60,000 hectares in 1961-65 to 575,800 in 1981-85.

Hot, Arid Climates Require Irrigation

Sudan and Nigeria are examples where wheat production is being developed to reduce imports, even though high temperatures hold down yields (1, 11). Wheat production in these countries is being developed on large-scale public irrigation projects requiring large capital investments. Because of the low yields, even under irrigation, production costs are generally too high for wheat to be economical, especially with the current low international prices for wheat.

Acid Soils Limit Yields

Some tropical regions have acid soils. Acid soils reduce the availability of phosphorus and contain free aluminum, which inhibits root growth (8, 10). Brazil is an example where research is underway to develop wheat varieties and cropping practices suitable for acid soils. However, there has been little progress in developing varieties for commercial production (4). Brazil has 50 million hectares of acid soils of which 12 million might be suitable for wheat. Similar soils are found in Africa (Zaire, Zimbabwe, Kenya, Tanzania, Zambia, and Mozambique) and in Southeast Asia (Burma, Thailand, Malaysia, and Indonesia).

Summary

Rising yields now make a larger contribution to increased wheat output than expanding area in the major wheat growing regions of the developing world. Wheat yields can continue to increase as management practices improve and higher yielding varieties are developed. Thus, in those countries where wheat is a suitable crop, it appears that production can grow at least as rapidly as demand. Except for Argentina, however, the major wheat-growing countries of the developing world do not appear likely to become steady, growing wheat exporters. Exportable surpluses in these countries will occur from time to time depending upon the weather.

Expanding wheat production significantly in the tropics requires heat-tolerant varieties. Until these are developed, it is unlikely that yields will be high enough to profitably produce wheat on a large scale. It is cheaper to rely on imported wheat. Thus, countries in the tropics are likely to be growing markets as long as their incomes rise and urbanization continues.

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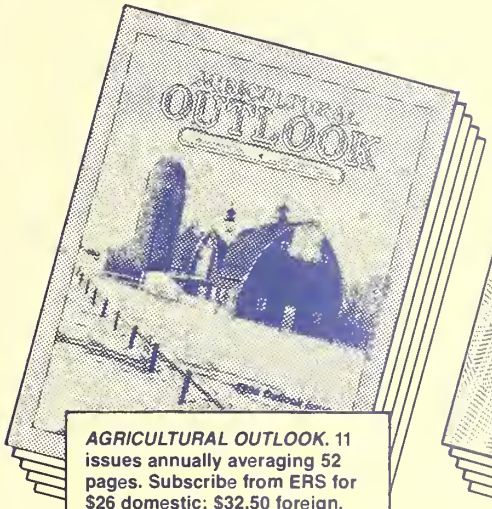

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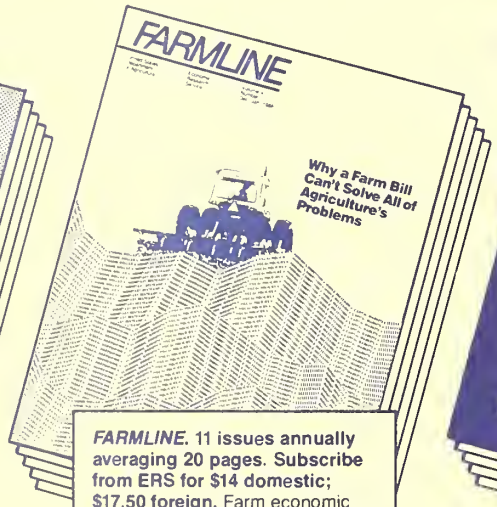

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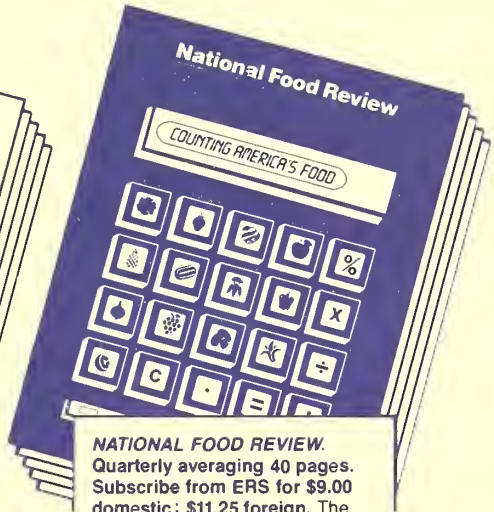

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