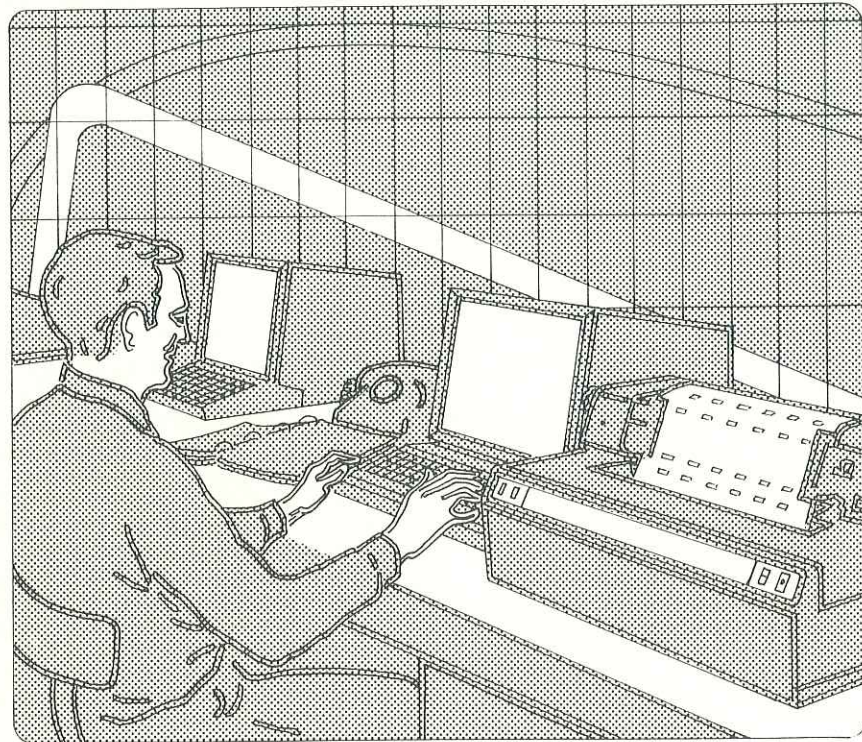


Output To Double In The Next Quarter Century



During the past 25 years world output of poultrymeat and eggs has grown faster than that of most other animal products and there are many reasons to believe that this trend will continue over the next quarter century.

According to statistics of the Food and Agriculture Organization of the United Nations (FAO), during the period 1961-1985, world production of milk and meat from ruminant animals rose by about 2%/year, that of pigmeat and eggs increased by over

3% while poultrymeat output showed an average annual growth rate of nearly 6%.

Poultrymeat and eggs together, currently account for almost one-fifth of world supplies of animal protein available for human consumption. Their combined share is still less than that of either red meat or milk though higher than that of fish. However, most of the increase in per caput supply of animal protein in the 1970's and 1980's has resulted from the expansion of poultrymeat and egg produc-

tion, as can be seen from Table 1.

Current world production of poultrymeat and eggs is mostly provided by chickens though, notably in East Asia, ducks are also important for meat and egg production while in North America and West Europe the share of turkeymeat in total poultrymeat output has increased significantly in the recent past.

As in the case of red meat and milk, production and consumption of poultrymeat and eggs continues to be concentrated in the developed countries. With only about one-fourth of world population, the developed countries (market and centrally-planned economies) at present account for some 70% of world poultrymeat and 65% of world egg production. Yet, while growth has slowed in the developed regions since the 1970's it has accelerated in the developing countries as a group.

The universal increase in the share of poultry products, especially poultrymeat, in total consumption of animal products reflects mainly the decline in the relative price of poultrymeat and eggs as a result of rapid technical progress.

Starting in North America in the late 1940's, poultry production in the developed countries has been increasingly "industrialized".

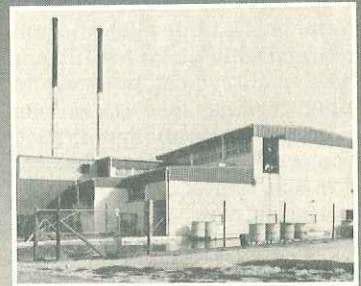
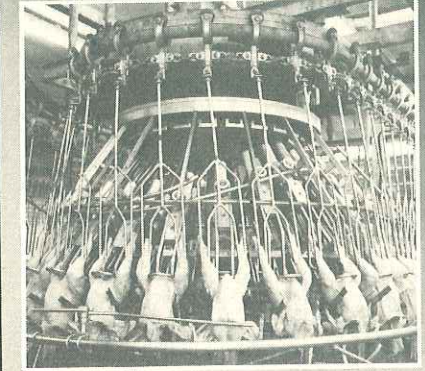
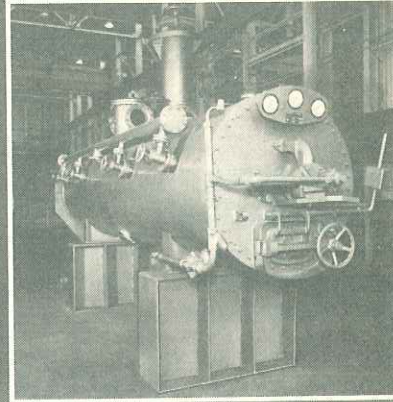
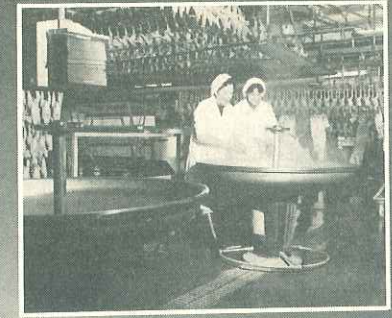
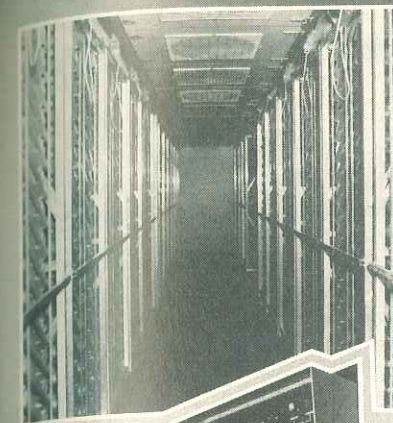
Labour productivity and feed conversion efficiency have improved and marketing costs decreased.

At the same time, prices of concentrate feeds, the principal input, have fallen in real terms. Hence, poultrymeat, initially one of the most expensive types of meat, has become the cheapest meat in countries with more advanced livestock industries, as illustrated by the accompanying chart.

More recently, similar developments have occurred in many developing countries. In particular in the oil exporting countries of Asia, North and West Africa and Latin America demand for and production of poultry products rose rapidly between the mid-1970's and the early 1980's, when rising petroleum prices improved incomes. With demand in these areas temporarily outstripping production, a number of other developing countries, notably Brazil, expanded their poultry industries to meet part of the deficit in the

TABLE 1:
PER CAPUT SUPPLIES OF TOTAL AND ANIMAL PROTEIN
(IN GRAMS PER DAY)

	WORLD		DEVELOPING COUNTRIES		DEVELOPED COUNTRIES	
	Average 1971-75	Average 1981-85	Average 1971-75	Average 1981-85	Average 1971-75	Average 1981-85
Total protein	64.9	68.1	52.5	57.9	96.0	97.7
Total animal protein	21.9	22.7	9.7	11.4	52.7	55.3
Total Meat	10.1	11.0	4.3	5.4	24.6	27.2
of which: Poultry	1.6	2.3	0.5	0.9	4.5	6.4
Milk	6.7	6.8	2.7	3.3	16.9	17.2
Fish	3.5	3.1	2.1	1.9	6.9	6.5
Eggs	1.6	1.8	0.6	0.8	4.1	4.4



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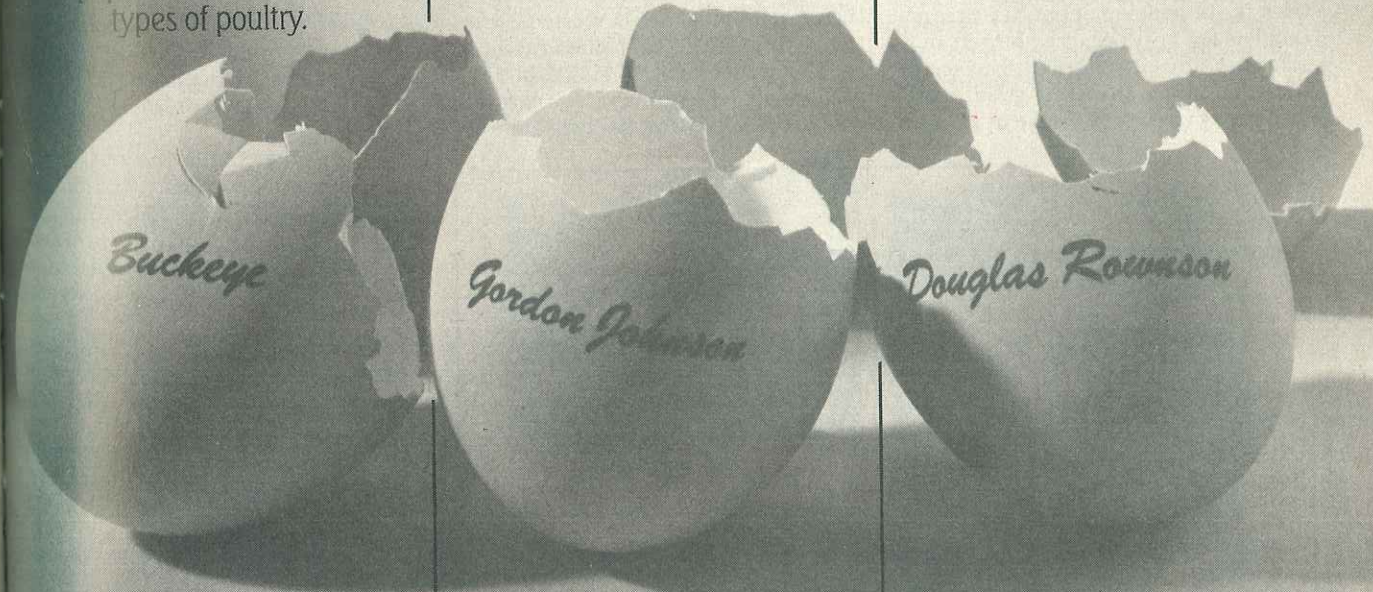
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oil countries.

Towards the mid-1980's, economic recession, accentuated by falling oil prices, curbed the expansion of poultry production in large parts of Latin America and Africa, but output continued to increase fast in Asia, notably China and India.

In peri-urban areas, where poultry farming has so far been concentrated in most developing countries, technical and economic performance is now close to the levels in developed countries. In Brazil which, next to China, is the largest poultrymeat producer in developing regions, feed conversion ratio in commercial broiler production has decreased from 3 in the 1960's to about 2 in the 1980's.

In the case of eggs, Morocco's commercial producers, which over the past two decades have increased their output from one million to over 200 million eggs, currently record an average annual yield of 200 eggs/hen, compared with some 60 in the subsistence sector. Cuba's state farms, which account for the bulk of poultrymeat and egg production in that country, raised the average annual yield per hen from less than 200 eggs in the 1960's to 249 by 1985, while feed consumption per egg fell from 200 g to 153 g.

In general in the developing countries the expansion of poultry production has not only occurred largely outside the traditional agricultural sector but the move towards great self-sufficiency in poultry products has also

tended to increase their dependence on imported technology, feeds and other production requisites. However, an acute shortage of capital, widespread unemployment and under-nutrition and rapid urbanization on the one hand and a growing number of small farmers and landless labourers on the other may be causing a change of policies in the long-run, with more emphasis being placed on rural development and self-reliance.

Over the next decades demand for the production of poultrymeat and eggs should continue to grow substantially reflecting expected increases in both world population and average incomes. On present trends, global output of poultrymeat and eggs could more than double during the next quarter century. However, this article will limit itself to an assessment of possible developments during the next 15 to 20 years, an exercise which is hazardous enough in view of the rate of change which we are facing and which, according to the latest report (entitled 'Our Common Future') of the World Commission on Environment and Development, "is outstripping the ability of scientific disciplines and our current capabilities to assess and advise."

In the coming 15 to 20 years the developed countries, notwithstanding their declining share in world population, will probably continue to account for the larger part of global poultry production, though average growth rates are likely to be considerably

higher in the developing regions.

In the developed countries average annual population growth rate is expected to be about 0.6% during the remainder of the century, with their total population rising to 1300 million by 2000. Although average incomes are likely to show a further increase, demand for animal products as a whole seems to be close to saturation point, particularly in West Europe, North America and Oceania.

In fact, nutritionists have begun expressing concern about over-consumption of certain animal products, especially those with a high fat content. There has also been some dissatisfaction among consumers with the quality of certain animal products produced under very intensive management. Moreover, changes in marketing and food consumption habits, such as the trend towards more processing and greater convenience as well as an increase in the proportion of meals taken away from home would appear to facilitate higher use of substitutes based on vegetable proteins. Finally, pulses may stage some comeback in view of their reputation as a valuable source of protein and fibre.

Though a major shift towards vegetarianism in high-income countries is unlikely, the number of people reducing or abandoning the consumption of certain animal foods, particularly meat, because of health, ethical and other non-economic reasons may continue to rise.

On the other hand, there is a widening difference between actual intake and statistically recorded apparent consumption, as wastage and losses (including feed use) at the processing, catering and household levels are increasing. Hence, with little change in physical intake, apparent per caput consumption of animal products may still rise somewhat in Oceania, North America and West Europe.

Prospects of demand for individual animal products differ considerably. They appear to be relatively bright for some low-fat milk products, fish, game and poultrymeat, but less favourable for red meat and eggs. Per caput demand for eggs will probably stagnate or decrease in high-income countries, not only in view of their fat and cholesterol content but also because in the rich societies, consumers generally consider eggs as a relatively uninteresting food.

In contrast, the popularity of poultrymeat has been rising. In particular in North America, meat demand has in recent years shifted from beef to poultry. This reflects not only the

TABLE 2:
CONSUMPTION OF MAIN TYPES OF MEAT AND EGGS

	TOTAL CONSUMPTION			PER CAPUT CONSUMPTION		
	1961-65 average	1971-75 average	1981-85 average	1961-65 average	1971-75 average	1981-85 average
	Million tons			,kg		
Total meat ^{1/}						
World	76.1	107.7	141.6	23.7	27.5	30.3
Developing countries	20.5	30.7	50.4	9.3	10.9	14.5
Developed countries	55.6	77.0	91.2	55.4	69.6	76.4
Bovine meat						
World	30.2	40.3	45.9	9.4	10.3	9.8
Developing countries	8.2	10.2	13.6	3.7	3.6	3.9
Developed countries	22.0	30.1	32.3	21.9	27.2	27.1
Pig meat						
World	27.4	40.4	55.0	8.5	10.3	11.7
Developing countries	6.2	11.5	20.4	2.8	4.1	5.8
Developed countries	21.2	28.9	34.6	21.1	26.1	29.0
Poultrymeat						
World	9.5	17.0	29.1	3.0	4.3	6.2
Developing countries	2.2	4.3	9.7	1.0	1.5	2.8
Developed countries	7.3	12.7	19.4	7.3	11.5	16.2
Eggs						
World	15.7	21.7	29.2	4.9	5.5	6.2
Developing countries	3.8	6.0	10.8	1.7	2.1	3.1
Developed countries	11.9	15.7	18.4	11.9	14.3	15.4

^{1/} Includes sheep, goat and other meats.



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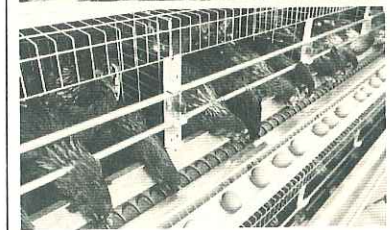
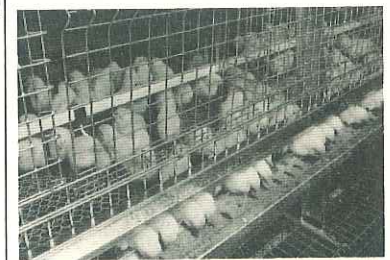
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low relative price of chicken and turkeymeat but also health considerations of consumers and, last but not least, strong marketing efforts by the poultry industry. As shown in Table 3, in terms of retail weight, poultrymeat will be the principal type of meat consumed in the USA during the second half of the 1980's.

Poultrymeat has also increased its share in total meat consumption in Canada and even in Australia, traditionally a beef and sheepmeat consuming country. The Australian Bureau of Agricultural Economics expects per caput consumption of poultrymeat in that country to rise by another 15% to 26.5 kg in the early 1990's.

In West Europe, the world's largest meat producing and consuming region, the shift towards poultrymeat has so far been less evident, though it could gain momentum in the future; as in North America, the popularity of turkeymeat is growing among West European consumers.

The scope for increases in consumption of animal products appears to be somewhat greater in East Europe, the USSR and Japan. Within the animal products sector of these countries, the share of poultrymeat is expected to rise significantly, reflecting both changes in consumption habits and a further decline in the relative price of this meat. Consumption of eggs could also increase somewhat in several centrally-planned developed countries but it may at best stagnate in Japan whose per caput consumption, at over 18 kg, is one of the highest in the world. Latest official forecasts by the Japanese Ministry of Agriculture indicate a slight increase in egg output in line with population growth whereas poultrymeat production is expected to rise significantly in response to increasing demand from processors and health conscious consumers.

However, most of the expected

growth in production and consumption of poultry products will occur in the developing regions where current consumption levels are low and income elasticities of demand are high. According to projections by the United Nations, between 1985 and 2000 the population of developing countries will rise by 1.9% annually to 4800 million, thus reaching nearly four-fifths of the world total. Population growth will be accompanied by a significant increase in per caput incomes in the developing countries as a whole, if projections by international institutions, such as the World Bank and International Monetary Fund, materialize.

Continued urbanization and the associated change in the diet will add to the effects of population and income growth in developing countries. Hence, average consumption levels should improve for all major animal products in the developing regions, with those for poultry products rising particularly fast. Poultry products will probably benefit by a further decrease in their relative prices as technical progress spreads.

In addition, unlike bovine and pigmeat, the consumption of which is precluded by religious creeds in large parts of Asia and Africa, poultrymeat is popular virtually throughout the developing regions.

Even so, average consumption of both poultrymeat and eggs will remain well below that in the developed countries. Moreover, differences among countries and, within countries, among consumer groups are expected to continue to be substantial, largely reflecting differences in purchasing power.

Generally, consumption levels will be higher in urban than in rural areas. National averages are likely to be relatively high in the Near East, followed by North Africa, Latin America and East Asia, but they will probably remain low in most parts of Africa

south of the Sahara and South Asia.

In absolute numbers, growth in poultrymeat and egg consumption and production is likely to be particularly impressive in the world's two largest nations, China and India. India's broiler industry expects an expansion of its broiler output from 75 million chickens in 1985 to 400 million by the end of the century, though average per caput availability of poultrymeat in this country would still be hardly more than 0.5 kg. China may establish itself as the world's leading meat producer, but apart from pork, levels of per caput consumption of animal products will remain comparatively low.

In most developing countries, expected levels of future demand, although substantially higher than at present, will be well below what people would probably want to consume if they had more money to spend. However, even to meet likely effective demand production of poultrymeat and eggs in the developing countries as a whole will have to be at least doubled by the beginning of the next century. This assumes that production will take place mainly in the same areas as consumption.

In fact, international trade in poultry products, which became relatively important in the late 1970's and early 1980's when demand temporarily outstripped production in the petroleum exporting countries, has already decreased more recently, and will probably shrink further.

Past experience indicates that, with the exception of some densely populated areas, such as Singapore or Hong Kong, where shortage of land and pollution problems have limited the scope for livestock production, countries prefer building up their own poultry industries, covering any deficit through imports of feeds rather than poultrymeat or eggs. This approach reflects not only the desire to generate employment and to add to overall development but also freight and price differentials. Long distance transport of poultrymeat or eggs is generally more expensive than that of the quantity of feed required to produce these foods. Moreover, consumers are prepared to pay higher prices for local fresh produce than for imported poultrymeat which is mostly frozen.

An expansion of poultrymeat and egg production to meet expected increases in demand in developing countries would require additional feed supplies of approximately 100 million tons of grain equivalent per year by the beginning of the next century. At first sight this appears to be relatively

TABLE 3:
PER CAPUT CONSUMPTION OF MEAT IN THE UNITED STATES
(KG, RETAIL WEIGHT)

	BEEF AND VEAL	PORK	POULTRY	TOTAL ^{1/}
1960	31.5	27.4	15.4	76.3
1970	39.2	28.1	22.0	90.6
1975	41.0	23.0	22.0	87.2
1980	35.4	31.0	27.5	94.5
1985	36.7	28.2	31.8	97.3
1986	35.4	26.6	33.3	97.5
1982 ^{2/}	33.5	27.1	35.7	98.0
1990 ^{2/}	33.5	26.5	37.0	98.5

^{1/} Including other meats. ^{2/} Forecast.

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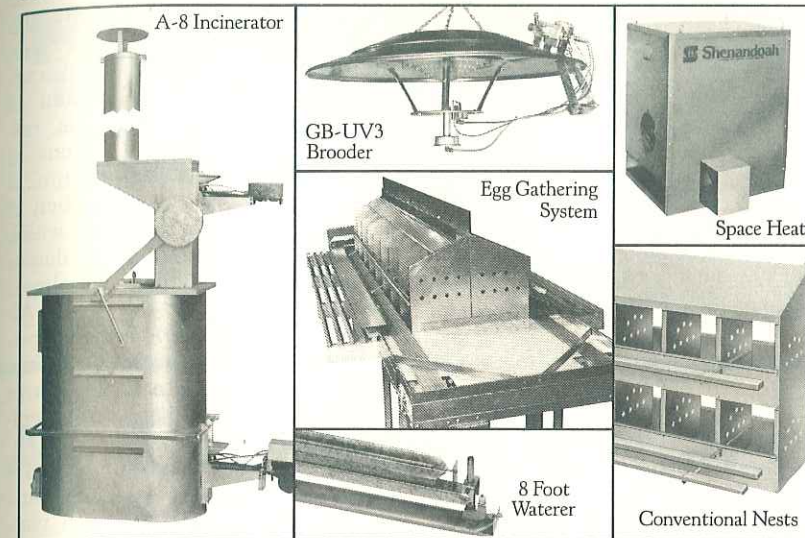
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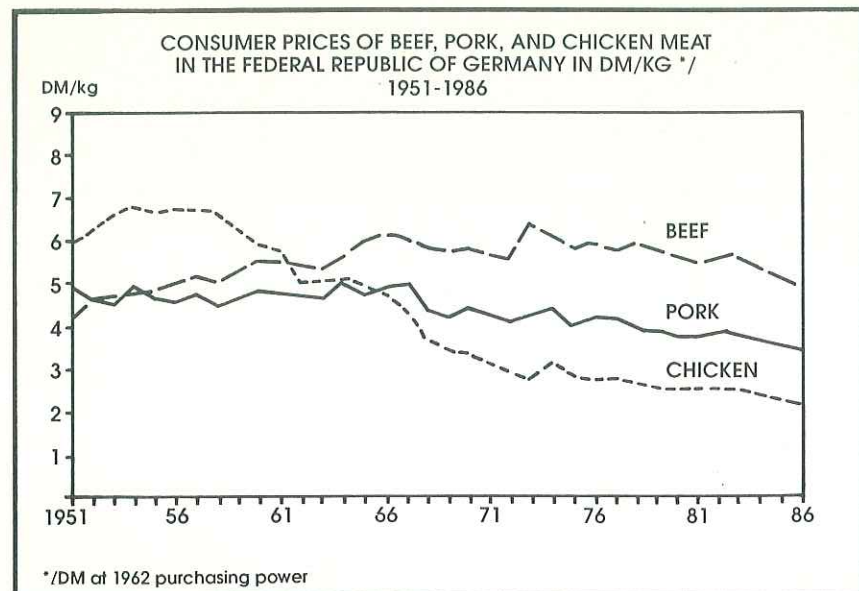
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Output To Double In The Next Quarter Century



small in the context of an amply supplied international grains market, with total world feed use of coarse grains and other cereals currently amounting to some 600 million tons. Moreover, world output of coarse grains and other concentrate feed can be expected to continue to grow, and there is also scope for substantial improvement in feed conversion efficiency in many developing countries.

However, the expected increase in feed requirements of the poultry industries in the developing regions has to be seen against their present total feed use of some 120 million tons of cereals of which a sizeable portion is imported. Finally, besides growing demand for grains in human consumption, continued expansion of the pork and dairy sectors also calls for more grains and other concentrate feeds. Hence, in a considerable number of developing countries, growth in poultrymeat and egg production will probably continue

to be hampered by shortage of local grains and protein feeds or by a shortage of foreign exchange to import such feeds.

The search for, or better utilization of, other locally available feeds and the establishment of alternative rations, which need not be less nutritious than conventional rations based on grains and oilcakes or fishmeal, might provide an alleviation in some countries. Such efforts are not limited to better use of crop residues or by-products of food industries. For example, cassava which in many tropical countries grows more easily than grains, could also become a more important feed in developing countries both for poultry and other livestock.

Regarding other livestock, the Philippines, the Dominican Republic, Cuba and other sugar exporters that face problems in an oversupplied international market are beginning to produce sugar cane for direct feeding

to livestock so as to replace at least part of their concentrate feed imports. In the Republic of Korea, one of the biggest coarse grain importers among the developing countries, the government is promoting the cultivation of forage on rice fields during the winter so as to reduce the dependence of cattle farmers on imported concentrate feeds. A number of countries have also organized large-scale collection of kitchen waste from households, restaurants and catering institutions. In Cuba, for instance, collection of kitchen waste for the production of "pienso liquido" ("liquid feed"), which is heat-treated, mixed with molasses and used for pig feeding, has almost trebled over the past ten years. Although some alternative feeds are primarily used in cattle and pig farming, they enable countries to reserve scarce imported concentrate feeds for the poultry industry.

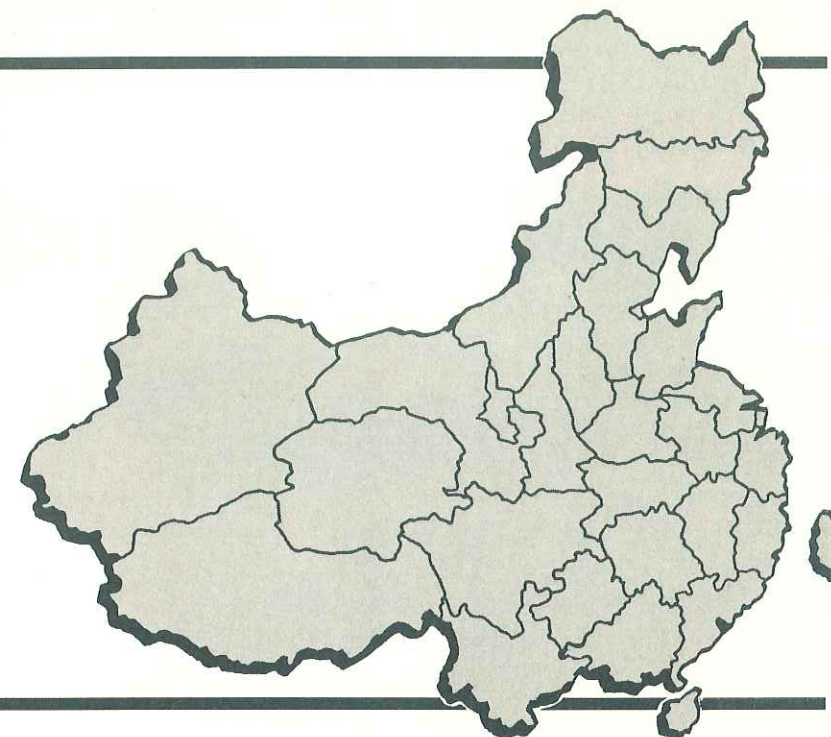
A possible re-orientation of approaches to poultry development and livestock development in general, placing greater emphasis on rural development and self-reliance, could eventually reduce the dependence not only on imported concentrate feeds but also on other production and processing requisites which have so far been imported mostly from developed countries. For instance, the increase in exports by developed countries of day-old chicks, which partly compensated for the decrease in their sales of poultrymeat and eggs to the developing countries since the early 1980's, has been reversed most recently. Following a sharp rise in the late 1970's and the early 1980's, sales by EEC countries, by far the largest suppliers, fell from 137 million chicks in 1983 to less than 100 million in 1986. —W. Krostitz, *Meat and Dairy Specialist, Commodities and Trade Division of FAO, Rome, Italy.*

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