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Prospects for Agricultural Trade with the USSR

Economic Research Service
U.S. Department of Agriculture

Prospects for Agricultural Trade with the USSR

Papers from a Seminar on November 30, 1973

FOREWORD

On November 30, 1973, the Economic Research Service (ERS) of the U.S. Department of Agriculture sponsored a seminar of Government and university specialists to discuss the longer term prospects for exports of agricultural commodities to the USSR. This report contains the four papers presented at the seminar. These papers should be of interest to those concerned with the forces likely to have an important impact on future developments in American agriculture and our foreign economic relations, especially trade in agricultural commodities.

The authors of these papers represent a variety of backgrounds and experiences. Gertrude E. Schroeder has a long background in Soviet economic affairs and D. Gale Johnson has a long background in general agricultural economic affairs and Soviet agriculture. Both are employed in universities. The other two authors--one, Robert S. Kovach, with experience in Soviet trade and payments capabilities and the other, David M. Schoonover, with experience in Soviet agriculture (and an employee of ERS in the Soviet Union Program Area)--are employed in the Government.

The papers offer information about Soviet economic performance and trade capabilities, and about the needs of the Soviet food sector. They also contain analyses about future prospects in these areas and the possible implications for Soviet foreign trade in agricultural commodities. The views expressed in the papers are those of the authors and do not necessarily represent the position of the U.S. Department of Agriculture.

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SOVIET ECONOMIC GROWTH AND CONSUMER WELFARE: RETROSPECT AND PROSPECT

By Gertrude E. Schroeder

THE RECORD DURING 1950-70

An assessment of Soviet economic prospects for the rest of this decade had best begin with a review of progress over the past two decades, together with an analysis of the basic causes and the current problems that are likely to shape the performance of the economy in the near term. During 1950-70, Soviet gross national product (GNP) rose rapidly by Western standards, but growth was slower in the 1960's (table 1). Average annual rates of growth in these decades were 6.0 percent and 5.4 percent, respectively. Rates of growth in all of the major goods-producing sectors declined between the two decades, whereas rates of growth in the services sectors increased. Such a pattern is usually to be found in industrializing countries. In most of the goods-producing sectors, rates of growth were substantially lower in the first half of the 1960's than in the last half, but, significantly, growth rates in the long-favored industrial sector declined in both periods.

The postwar decades have witnessed the gradual fruition of a revolutionary change in the Stalinist priorities characteristic of the prewar period, policies that had heavily favored investment and defense and grossly neglected consumption. As a consequence, Soviet consumers in 1950 were little better off than they were in 1928, or even in 1913 (1). 1/ Indeed, the policy of extremely unbalanced growth was continued into the 1950's, when the growth rate of investment averaged 12.6 percent, compared with 6.7 percent for consumption. In contrast, the fall in the growth of total GNP in the 1960's was accompanied by a dramatic reduction in the growth rate for investment to an average of 6.9 percent annually, whereas the growth rate of consumption was maintained at an average of 5.1 percent annually. During the two decades, State-provided communal consumption (health and education) grew much faster than personal consumption (all other goods and services).

The relatively high rates of economic growth during 1950-70 were the result of rapid growth in both labor and capital inputs and a slow increase in productivity (table 2). Total employment increased at an average annual rate of 1.5 percent during 1951-60 and 2.1 percent during 1961-70. The capital stock grew at an average annual rate of nearly 9.5 percent in the former period and 8.0 percent in the latter period. However, factor productivity increased 1.3 percent annually during the 1950's, and the rate fell to 0.9 percent annually during the 1960's. Thus, all of the drop in overall economic growth over the period reflected a worsening of the efficiency with which the Soviet Union was using its labor and capital resources. In particular, these figures mean that the rate of return on new investment was falling sharply: It dropped by more than two-fifths over the two decades.

1/ Underscored numbers in parentheses refer to References on p. 15.

Table 1. Trends in gross national product and selected major components, USSR, 1950-72

Item	Index numbers (1950=100)					
	1950	1955	1960	1965	1970	1972
Total GNP 1/	100.0	132.4	179.4	229.4	303.6	322.9
Consumption 2/	100.0	143.3	191.7	235.3	315.1	339.3
Investment 3/	100.0	178.9	328.1	445.3	640.6	732.8
Industry 4/	100.0	166.1	254.3	355.2	493.0	549.6
Agriculture 5/	100.0	122.8	152.6	175.4	221.0	203.5
Construction 3/	100.0	180.2	339.5	416.3	584.9	674.4
	Average annual rates of growth					
	1951-55	1956-60	1961-65	1966-70	1971-72	
	Percent	Percent	Percent	Percent	Percent	
Total GNP	5.8	6.3	5.0	5.8	3.1	
Consumption	7.5	6.0	4.2	6.0	3.8	
Investment	12.3	12.9	6.3	7.5	7.0	
Industry	10.7	8.9	6.9	6.8	5.6	
Agriculture	4.2	4.4	2.8	4.7	-4.0	
Construction	12.5	13.5	4.2	7.0	7.4	

1/ Derived according to methodology presented by Stanley Cohn in "General Growth Performance of the Soviet Economy," JEC, Economic Performance and the Military Burden in the Soviet Union, 1970, pp. 9-17.

2/ David W. Bronson and Barbara S. Severin, "Soviet Consumer Welfare: the Brezhnev Era," JEC, Soviet Economic Prospects for the Seventies, 1973, pp. 398-402.

3/ Derived according to methodology presented by Scot Butler in "The Soviet Capital Investment Program," Economic Performance and the Military Burden in the Soviet Union, 1970, pp. 50-51. Data are expressed in prices of 1 January 1969. Data for early years expressed in 1955 prices have been converted to 1969 prices using 1969/1955 price ratios. Information to construct price ratios was taken from Nkh. 1969 and Nkh. 1970 which present investment data for selected periods in both 1955 and 1969 prices.

4/ Rush V. Greenslade and Wade E. Robertson, "Industrial Production in the USSR," JEC, Soviet Economic Prospects for the Seventies, p. 280.

5/ Douglas B. Diamond and Constance B. Krueger, "Recent Developments in Output and Productivity in Soviet Agriculture," JEC, Soviet Economic Prospects for the Seventies, p. 336.

Table 2. Indicators of productivity trends in the USSR, 1950-72

Item	Index numbers (1950=100)					
	1950	1955	1960	1965	1970	1972
Total output (GNP)	100.0	132.4	179.4	229.4	303.6	322.9
Total inputs	100.0	125.2	156.9	198.0	242.3	262.6
Labor	100.0	109.6	115.8	130.3	143.0	147.9
Capital	100.0	152.0	247.0	372.7	535.2	621.4
Factor productivity	100.0	105.8	114.3	115.9	125.3	123.0
Labor	100.0	120.8	154.9	176.1	212.3	218.3
Capital	100.0	87.1	72.6	61.6	56.7	52.0
	Average annual rates of growth					
	1951-55	1956-60	1961-65	1966-70	1971-72	
Total output (GNP)	5.8	6.3	5.0	5.8	3.1	
Total inputs	4.6	4.6	4.7	4.1	4.2	
Labor	1.8	1.1	2.4	1.9	1.7	
Capital	8.7	10.3	8.6	7.6	8.0	
Factor Productivity	1.2	1.7	0.3	1.7	-1.1	
Labor	4.0	5.2	2.6	3.9	1.4	
Capital	-2.9	4.0	3.6	-1.8	-4.9	

Sources: Inputs have been combined using a Cobb-Douglas production function, with weights of 0.6 for labor and 0.4 for capital, averaged geometrically. These weights are those suggested by Abram Bergson in "Toward a New Growth Model," Problems of Communism, March-April 1973, p. 2.

Labor: Murray Feshbach and Stephen Rapawy, "Labor Constraints in the Five-year Plan," Joint Economic Committee, Soviet Economic Prospects for the Seventies, Washington, 1973, pp. 520-21.

Capital: Narodnoe Khoziaistvo SSSR v 1970 godu, p. 60. SSSR v tsifrakh v 1972 godu, p. 32. The figure for 1955 was interpolated from data in Stanley H. Cohn, "The Economic Burden of Soviet Defense Outlays," in Joint Economic Committee, Economic Performance and the Military Burden in the Soviet Union, Washington, 1970, p. 188.

GNP: Table 1.

The postwar experience of the USSR contrasts with that of the United States, Japan, and major industrialized countries of Western Europe, where most of the growth in GNP came from higher productivity, rather than from additional labor and capital inputs (2). According to Western calculations, overall productivity of labor and capital in the USSR in the mid-1960's was little more than one-third of that in the United States, less than three-fifths of that in Western Europe, and a little below that of Japan (3). These relative levels of productivity are evidence of a large Soviet technological lag. Moreover, the lag evidently is increasing, since productivity has recently been rising faster in Western industrialized countries than in the Soviet Union.

The fall-off in the growth of productivity was particularly sharp during 1961-65. In the industrial sector the average annual rate of growth dropped from 3.5 percent in 1951-60 to 0.5 percent in 1961-65 (4), and in agriculture the corresponding drop was from 2.3 percent to zero (5). Although these rates recovered significantly in both sectors during 1966-70, the growth rates were still well below those obtained in the 1950's. Productivity growth in the economy as a whole in 1961-65 was a mere 0.3 percent.

The causes underlying the dramatic drop in growth rates of productivity have yet to be fully explored. Relatively less favorable weather, plus the absence of large new programs of the Virgin Lands type, account for at least part of the halving of productivity growth in agriculture in the 1960's as compared with the 1950's. In industry, the drop in productivity growth rates by two-thirds has been explained as the result of a complex of factors: disruptions brought about by a major reduction in the workweek; interruptions in investment programs caused by a sudden, major buildup of advanced weapons systems; administrative turmoil that characterized much of the Khrushchev era; continued excessive growth of investment relative to labor; and increased difficulties in planning and administering a larger and more developed economy. The first three factors apply only to the first half of the decade. The latter half was free from major changes in programs and was characterized by administrative stability. What requires explanation, then, is the failure of productivity growth in industry and agriculture during 1966-70 to regain the levels of the previous decade. One hypothesis is the presence of a generalized condition of diminishing returns to central planning, not only because of the continued excessive growth of capital relative to labor, but because of the greatly accelerated bureaucratization of economic life that has accompanied the so-called economic reforms in the industrial sector. Ironically, the very purpose of these reforms was to increase efficiency.

With respect to consumer programs, the period 1950-70 brought large and highly visible improvements in the material well-being of the Soviet people (table 3). Per capita consumption of food nearly doubled, and the quality of the diet improved markedly (6). For example, per capita consumption of the quality foods--meat, fish, milk, and eggs--doubled, while per capita consumption of the starchy foods--potatoes and grain products--decreased by one-third (7). Per capita consumption of soft goods, such as shoes and clothing, and also the availabilities of communal and personal services of various kinds, almost tripled. Most spectacular of all, however, were the greatly increased per capita stocks of consumer durables. Overall, this category increased 12-fold. With respect to housing, the rate of progress, although slow, was nonetheless steady and also highly visible. In addition to these large gains in consumption of material

Table 3. Trends in per capita consumption and real disposable income, USSR, 1950-72

Item	Index numbers (1950=100)					
	1950	1955	1960	1965	1970	1972
Total consumption	100	131.6	161.1	183.5	233.8	246.9
Food	100	125.6	144.6	160.0	194.6	206.2
Soft goods	100	150.0	194.8	210.3	289.7	312.1
Consumer durables	100	300.0	557.1	828.6	1242.9	1357.1
Personal services	100	125.9	170.4	222.2	287.9	344.4
Health and education	100	142.4	181.8	224.2	287.9	315.2
Real disposable income	100	163.9	219.3	288.6	398.6	440.7
	Average annual rates of growth					
	1951-55	1956-60	1961-65	1966-70	1971-72	
Total consumption	5.6	4.1	2.6	5.0	2.8	
Food	4.7	2.8	2.1	4.0	3.0	
Soft goods	8.4	5.4	1.5	6.6	3.9	
Consumer durables	24.6	13.2	8.3	8.4	4.6	
Personal services	4.7	6.2	5.4	6.6	6.0	
Health and education	7.3	5.0	4.2	5.1	4.7	
Real disposable income	10.4	6.0	5.6	6.6	5.3	

Source: Computed from indexes in: David W. Bronson and Barbara S. Severin, "Soviet Consumer Welfare: the Brezhnev Era," in Joint Economic Committee, Soviet Economic Prospects for the Seventies, Washington, 1973, pp. 393, 398-401. Population data from Ibid., pp. 472-73.

goods and services, the Soviet people's welfare was improved by continued large State expenditures on education and health, by greatly liberalized pensions and other similar benefits, by a reduced workweek, and by the lifting of some of the more onerous restrictions on personal freedom. Real per capita disposable income increased fourfold.

Despite these impressive gains, the level of living of the Soviet people in 1970 was merely one-third of that in the United States, about one-half that in England, France, and West Germany, perhaps a little below that even in Italy and Japan, and well below that in the East European Communist countries of East Germany and Czechoslovakia. Per capita consumption of meat was well below that even in Poland and Hungary. If the far superior quality, variety, and ready availability of goods and services in Western countries could be adequately allowed for in such comparisons, the relative position of the Soviet Union would be shown to be considerably less favorable.

THE EXPERIENCE IN 1971-73

The Soviet economy performed poorly in 1971-72, primarily because of bad weather in agriculture and abnormal difficulties in managing the construction and commissioning of new industrial capacities. The growth of GNP was 4.0 percent in 1971 and 1.6 percent in 1972. Comparable figures are 6.2 and 5.0 for industrial production and 0.1 and -7.8 for agricultural production. Overall, 1971-72 was by far the worst 2-year period in Soviet postwar experience. Industrial productivity growth averaged a mere 0.8 percent, and agricultural productivity actually declined by 3.8 percent (8). Since the growth of labor and capital inputs was maintained approximately at past levels, productivity in the economy as a whole also declined significantly.

A notable feature of Soviet policy during this 2-year time of troubles was the effort made to maintain substantial growth in per capita consumption. Despite the sharp drop in the growth of domestic production of food products and soft goods, per capita consumption of these goods continued to increase at moderate rates. This progress was maintained by drawing down on food stocks, by extraordinarily large imports of grain, and by high levels of imports of manufactured consumer goods. In 1972, about $600 million in grain was imported from the West, and in both 1971 and 1972 imports of manufactured consumer goods amounted to close to $300 million, mainly shoes, clothing, and textile products (9). Probably most urgently wanted by Soviet consumers are more and better housing, more personal automobiles, and more quality foods, especially meat. In 1971-72 the total number of square meters of housing built somewhat exceeded the average for the preceding 5-year period, permitting the continuation of the slow improvement in per capita living space available to the population. The provision of cars for private ownership, however, is the government's "showcase" program for catering to the wants of the people. Sales of cars to the population, which had averaged 60,000 to 70,000 annually during the 1960's, jumped to 123,000 in 1970, to 222,000 in 1971, and to 377,000 in 1972 (10). Even though prices of cars are high, their quality uneven, and service facilities scarce, the demand for cars is very strong. With this program, the Government can simultaneously provide the people with something they want badly, and by setting high prices on the cars, can absorb substantial amounts of excess pur-

chasing power that is now present in the form of savings deposits. With the aid of imports, per capita consumption of meat rose nearly 10 percent during 1971-72.

Nonetheless, despite the efforts to maintain an aura of substantial improvement in consumer welfare, the growth of per capita consumption as a whole averaged only 2.8 percent annually during 1971-72, well below the average rate of 5.0 percent maintained during 1966-70 and also below the 4.0 percent annual growth implied in the ninth 5-year plan. Indeed, the economic difficulties in 1971-72 led the planners to cut back many of the goals originally set for 1973. Notable among these changes were sharp reductions in planned growth of processed food and soft goods, reflecting expected reduced availabilities of agricultural raw materials and failure to complete new plant capacities on schedule. According to Soviet plan fulfillment announcements, the performance of the economy improved considerably during 1973 (11). The reduced plans for total industrial output and for output in the light and food branches were overfulfilled by small margins. However, the plans for commissioning of new industrial capacities, for housing, and for increase in personal services were not met. Growing conditions in agriculture improved greatly in 1973, so that total output of the sector rebounded by a reported 14 percent. Because of agriculture's large weight in total output, GNP also increased sharply in 1973, probably by at least 6 percent. Per capita consumption probably also increased at a somewhat higher rate than in 1971-72, and improvement should continue in 1974, when larger supplies of agricultural raw materials will be reflected in increased output of processed foods and soft goods.

LEGACIES OF PAST SUCCESSES AND PAST NEGLECTS

At present, the Soviet Union faces two problems of huge dimensions. Both the problems and their potential solutions are closely interconnected. The first problem concerns the need for substantial improvements in productivity, in order to stimulate economic growth and reduce the USSR's large and growing technological lag behind the West. The second problem entails the necessity for finding means to satisfy the wants of an increasingly affluent and sophisticated population. The signs of serious malaise on both the productivity front and in the consumer sector are clear and unmistakable. Progress toward solving the latter problem is critical to providing the incentives that will stimulate both workers and managers to exert themselves and to work productively and creatively. The potential solutions to both problems present the Soviet leadership with perhaps its most painful set of choices since the advent of central planning. Modernizing the economy across the board entails severe competition for the allocation of scarce investment funds and foreign exchange. Generating increased efficiency and satisfying fussy consumers require changes in the institutional arrangements for managing the economy. But both the necessary major reallocation of investment priorities and appropriate institutional changes pose threats to existing bureaucratic elites and to the existing balance of political power.

As a result of long-continued, lopsided investment priorities, the semi-developed Soviet economy is now probably the most severely unbalanced of any moderately industrialized country in the world. Despite significant progress since 1950, the decades of relative neglect of consumer goods industries,

housing, and retail trade and service facilities means that the consumer sector is woefully backward as compared with Western countries, or even with most East European Communist countries. By all accounts, the average level of technology in Soviet light and food industries lags several decades behind the West. The approximately 7.8 square meters of housing space per capita now available to the Soviet people makes them the most poorly housed of any major country in Europe and poorly housed also by comparison with the Government's minimum standard for health and decency. By the Soviet Union's own admission, retail trade and service facilities are not only grossly inadequate to the demand for them, but in terms of quantities per capita are available in far fewer numbers than in both Western and Eastern Europe (12). Huge allocations of investment resources would be required to make significant progress toward reducing this large lag in any reasonably short period. Imports of modern plant and equipment from the West help to reduce the backwardness of consumer industries, but these imports compete for hard currency and credits with the traditionally high priority branches, such as heavy machinery, fuels and chemicals.

With respect to agriculture, the neglect of the Stalin years has now been superseded by policies that have made agriculture a larger claimant on total investment in each of the post-1950 5-year plans, and the ninth 5-year plan schedules a continuation of this trend. Agriculture now absorbs close to one-fifth of total annual investment. Despite the huge aggregate investment over the years, Soviet technology (measured by fertilizer applied to crops and truck and tractor inventories) is still less than half the U.S. level (13). Although enormous investments would also be required to close this gap, an even more important consideration is the need to find ways to improve the suitability and quality of the investment mix in agriculture and the efficiency with which such resources are used.

The problem of raising productivity in the economy as a whole is not merely one of altering the mix of investment toward high-technology sectors, where new investment might be expected to bring relatively quick returns. Rather, what is urgently needed is removal of the obstacles to innovation at the level of the individual enterprise--particularly in industry, in agriculture, and at construction sites (14). These long-standing obstacles are well-known and are due largely to the fact that all economic units are evaluated and their personnel rewarded on the basis of fulfilling plans for output, measured both in physical units and in rubles. Since innovation interrupts production routines and threatens plan fulfillment, managers avoid innovations, "the way the Devil shies away from incense," to quote Party Secretary Brezhnev (15). As the Soviet press testifies continually, none of the tinkerings with incentives arrangements that have been made in the past two decades has altered this basic attitude. Managers' strong preference for the status quo is reinforced by the fact that their material and equipment inputs are planned in physical units and are rationed to them by a cumbersome bureaucracy, which functions poorly. The planners' perennial efforts to "force" efficiency gains by administrative manipulation of input norms produces a chronic state of tautness in the economy.

A large accumulation of waste of resources in the economy is also brought about, because the interconnections between producers, the suppliers of their raw materials and machinery, the shippers of their products, and their customers are seldom direct; instead, bureaucratic agencies of one kind or another are intermediaries in the entire chain from the producer of inputs to the final

consumer. Moreover, the pricing, incentive, and risk-bearing arrangements are such that the ostensibly "economic" connections (contracts) between and among the various units in this chain are in reality "administrative" connections and are not effective. It is of little concern to the producer of fertilizer, for example, whether the bag of fertilizer he ships arrives at a collective farm in good condition and on time. If the quality is not up to specifications, the farm will very likely take it anyway, because it has no alternative supplier. If the railway damages the bag or unloads the fertilizer at a station where there is no protection from the weather, neither the producer nor the farm has much recourse, for there are no alternative shippers. If the producer of the fertilizer gets ammonia that is not of the quality ordered, he will probably have to make do with it anyway, because he, too, has no alternative supplier, and he must fulfill his plan somehow. The existing system of contract law, the fines and penalties, the so-called "direct ties," and the administrative channels for complaint and redress have not produced the mutuality of economic interests that could reduce this cumulative waste. In a word, the system is one where there are often failures all along the line, and everybody can blame somebody else. Nobody (or everybody) is "really" at fault (16).

Besides reflecting past investment neglect, the current malaise in the consumer sector stems also from the consequences of past successes in providing large quantitative gains in per capita consumption. The progress over the past two decades has given the Soviet population a level of living that is now well above the subsistence level. The people have plenty to eat, even though half their daily calories are still obtained from starchy foods, such as bread and potatoes, and meat remains in short supply. Clothing, shoes, and textile products are plentiful, although quality is poor by Western standards. Substantial proportions of all families own the basic consumer durables--sewing machines, washing machines, television sets, and refrigerators--however obsolete the models may be in comparison with those in the U.S. and Western Europe. As a consequence of this relative "affluence," consumers have become particular about what they will buy. They now demand quality, durability, variety, and style in clothing and shoes. When these attributes are not present, consumers simply refuse to buy the products that are made available. Large inventories of unwanted goods piled up in the early 1960's and are doing so again in the early 1970's (17). In contrast, soft goods imported from the West are eagerly snapped up, almost irrespective of price. People are also now becoming particular about quality and modernity in durable goods, so that inventories of obsolete and inferior models of some kinds of these goods are accumulating.

Moreover, as incomes continue to rise, people have more money to spend on personal services and on the numerous kinds of everyday household items of the "odds and ends" sort, ranging from meat grinders to ball point pens. The Soviet press refers to such items as "a thousand trifles." The availability of personal services, such as laundries, repair services, barber services and the like, is still minuscule; in 1972 their total amounted to a mere 20 rubles per person per year (18). Products of the "odds and ends" variety are produced by some 10,000 plants in almost all industrial ministries, usually as sidelines (19). As a result of this stepchild status, quality and variety are poor, and shortages of one or another item are pervasive.

With the growing affluence and sophistication of the Soviet populace, the consumer sector has become increasingly difficult to plan and administer.

Despite the tinkering of recent years, the production-distribution system is still geared to turning out ever larger quantities of a limited number of standard products. It is badly suited to generating quality, variety, product improvement, and novelty. It is also poorly adapted for producing a variety of personal services and literally tens of thousands of "trifles" in small batches in the right quantities, and for distributing them where and when they are wanted (20). Finally, the system lacks the organization, incentives, and flexibility to forecast the changing demands of a fickle populace with accuracy and speed and to adjust production expeditiously to shifts in demands. The many bureaucracies that are now involved in the management of consumer demand render the system cumbersome and unresponsive. The result is chronic visible waste, flourishing black or "gray" markets, ubiquitous queues, and disgruntled consumers, whose principal recourse seems to be to complain endlessly in the press. Another response has been to salt away money in savings bank deposits, whose total has risen 5.6 times since 1960. The average size of deposit now amounts to nearly 5 months' wages for the average wage and salary worker. The average deposit is larger in rural areas than in cities, even though incomes are lower, thus testifying to the greater unavailabilities of desired goods and services in rural areas. Finally, the seemingly intractable problems of alcholism, high rates of labor turnover, and lack of "labor discipline" may well reflect the general frustration of the working populace over the fact that money earnings cannot be readily exchanged for desired goods and services.

LEADERSHIP RESPONSES

The Brezhnev-Kosygin leadership has responded to the twin problems of boosting productivity and improving incentives for worker-consumers in three main directions. The first approach has been a large expansion of imports from the developed West. To upgrade industrial technology, imports of machinery and equipment nearly tripled, rising from $510 million in 1965 to $1.4 billion in 1972 (21). To placate consumers, imports of manufactured consumer goods increased nearly fivefold--from $63 million in 1965 to $284 million in 1972.

A second line of attack was the introduction of a sweeping set of changes in administrative and incentive arrangements throughout the economy. Hailed as the "third great economic reform in Soviet history," these changes have involved (1) the restoration of the ministerial system of economic administration and the addition of several new bureaucracies; (2) reforms and increases in industrial wholesale prices and agricultural procurement prices; (3) changes in the success indicators for enterprises from emphasis on fulfilling plans for gross value of output to meeting targets for sales, profitability, labor productivity, upgrading product quality, and producing consumer goods; (4) statutory provision of greater freedom of decisionmaking for enterprises in the areas of labor and investment; (5) extension of direct contracting arrangements between producers and their suppliers and customers. In general, the aim of the reforms was to raise efficiency and generate a faster rate of technological progress by the greater use of "economic levers"--prices, a charge for capital, newly authorized enterprise incentive funds, more bank credits, and modified success indicators. As originally envisioned by the spokesman for the reforms, these levers were to be accompanied by greatly reduced use of "administrative methods." Increased efficiency was to be brought about through the spontaneous responses of enterprises to these new levers.

In fact, after 8 years of implementation of this so-called "reform" (mainly in industry and transportation), matters have turned out quite differently from the hopes and expectations of the reformers. The restructuring of the economic bureaucracy was effected with despatch. In the writer's opinion, this major change is the only one that has really mattered; it ended a period of bureaucratic chaos resulting from Khrushchev's frequent reorganizations of the administrative apparatus and from his "campaign" approach to the solution of economic problems. The task of carrying out the many other provisions of the reform was given to the rejuvenated bureaucracy. In the process, the "economic levers" have been effectively converted into administrative levers by incorporating all of them into the traditional routines of the planning process (23). In fact, the government is now planning and administering the economy in a degree of detail and complexity never before attempted. The task has been facilitated by more and better computers and by an expanding bureaucracy, whose size has increased by more than one-third since 1965. In agriculture, too, prices have been increased several times, the incentive system for collective farmers has been radically changed, and the reform has been extended to a substantial percentage of State farms, about half of the total by 1972 (23).

However, none of the numerous administrative changes or the revisions in incentives has altered any of the fundamental characteristics of the system. As before, prices are centrally fixed, incentives are geared to meeting plan targets, excessively taut planning prevails, producers' goods are physically rationed and centrally distributed, and direct contracts are administratively arranged. The urgently desired, large improvements in productivity, quality of products, rate of introduction of new technology, and attention to customer wants have not materialized, although productivity in 1966-72 improved appreciably over the record of 1961-65. That period was unusually depressed, due both to poor weather in agriculture and to the disorder created by some of Khrushchev's policies and by his counterproductive methods of management.

In response to the stubborn persistence of perennial problems, the leadership has resorted to a third approach--the use of "campaigns," socialist competitions and emulations, "volunteer" Saturday work, stress on moral incentives, shock work, pledges, and Party pressure--in an allout effort to force more output and greater efficiency in the use of resources throughout the economy. Such approaches have not been notably successful in the past, and they would seem especially unsuitable for the intricate tasks of generating technological progress and catering to consumers' wants.

Along with these general approaches, the Soviet leadership in the past several years has seemed particularly concerned about the persistence of chronic problems in the consumer sector. The worker riots in Poland in December 1970 may have been a sensitizing factor. Mounting evidence of consumer discontent over poor quality and sporadic shortages of numerous desired goods and services has led the regime to launch a massive attack on the malaise by means of administrative fiat and resort to "campaigns." During 1970-73 the Party and Government issued six major decrees specifically directed toward remedying one or another chronic problem (24). The most important of these decrees dealt with the persistence of unpredictable shortages of numerous so-called "trifles." Issued in October 1971, this decree launched a major "campaign" to increase the production of such goods in plants in heavy machinery and defense industries.

Although this move has been backed up with strong Party pressure and has generated some successes in the form of increased output of one product or another, the campaign has also produced much confusion. Nobody seems to know how much of what "trifle" is wanted where, so plants, under pressure to do something, make whatever item they can produce most easily. Several plants in the same city may begin making the same thing, thus creating a glut on the local market. Meanwhile, press complaints about surpluses and shortages and poor quality of goods and services continued at about the same level of intensity in 1973 as in the past (25).

PROSPECTS FOR THE 1970's

The Soviet Union is now in the middle of the ninth 5-year plan (1971-75), and the planners are drafting the tenth 5-year plan and a 15-year plan covering 1975-90. The ninth 5-year plan scheduled average annual rates of growth over 1970 levels of about 6.0 percent in GNP, 8.0 percent in industry, and 3.5 percent in agriculture. Investment was to increase at 7.3 percent annually, and per capita consumption was to rise by about 4.0 percent annually. These targets are ambitious. In both the industrial and agricultural sectors, their fulfillment would require increases in productivity that far exceed the rates of growth obtained during 1966-70 and even the much higher rates achieved during the 1950's. With such unrealistically high productivity requirements and the underfulfillment of plan goals already experienced during 1971-73, the growth targets for the major economic aggregates in 1975 probably cannot be met.

Rather than to focus on specific plans and the likelihood of their fulfillment, it seems more useful to consider the prospects for the economy's performance over the decade of the 1970's as a whole, in the light of probable availabilities of labor and capital and an analysis of the factors that will affect the efficiency with which these resources are used. According to estimates of the U.S. Bureau of the Census, average annual employment in the Soviet economy rose fairly steadily at about 1.8 percent per year during 1950-70 (26). This relatively rapid rate of growth reflects both an increase in the population of working age (16 years of age and over) and an increase in labor force participation rates, especially for women. The overall rate, about 72 percent, is probably the highest in the world and can hardly be raised further without substantial cutbacks in educational programs. On the basis of demographic trends and the assumption of no significant change in participation rates, the Bureau estimates that employment growth will slow to an average rate of 1.5 percent annually during the 1970's. This anticipation of a slowdown accords with the analyses of Soviet economists, who have for several years expressed grave concern about the expected tautness of the labor supply over the next decade and beyond.

According to Soviet official statistics, the total stock of fixed capital grew at the extraordinarily high average rate of almost 9.5 percent annually during the 1950's (27). Average annual growth slowed to 8.6 percent in 1961-65 and to 7.6 percent during 1966-70. Growth was about 8.0 percent in 1971-72. These rates of increase in the capital stock exceeded the growth of GNP by sizable margins throughout the period. To maintain these high rates, the Soviet Union has had to devote a continuously rising share of its annual total output to investment. Thus, total investment as a share of GNP accounted for nearly

one-third of GNP in 1973. Total investment increased 12.6 percent annually during the 1950's and 6.9 percent during the 1960's. Although an average annual rate of 7.0 percent was registered during 1971-72, Soviet revised plans for 1973 called for a growth of only 3.5 percent. As already noted, an average annual rate of 7.3 percent is provided in the plan for 1971-75.

Given past trends, coupled with the fact that investment plans have not been fulfilled in recent years and the regime's present concern about the need to improve consumer welfare, it seems reasonable to suppose that investment growth will average no more than 7 percent annually during the 1970's. If the Soviets continue their recent policy of fairly rapid annual rate of retirement of obsolescent fixed assets, this rate of investment would result in an annual growth of the capital stock of perhaps about 7 percent, a rate consistent with trends in total capital stock during 1950-72. Growth of the capital stock at a rate substantially higher than this would not only be at variance with the trends of the past 22 years, but it would also entail a significant reduction in the share of resources that could be made available for consumption (28).

With employment growing at about 1.5 percent annually and the capital stock at about 7 percent annually, total inputs of labor and capital could increase about 3.7 percent annually (29). This growth would be substantially below the 4.5 percent average annual increase obtained over the past two decades. Thus, if economic growth is to be maintained even at the reduced average rates of the 1960's, the productivity of labor and capital will have to increase sharply. This stark fact underlies the urgent concern of the Brezhnev-Kosygin leadership to raise efficiency especially in industry and agriculture and also their eagerness to obtain modern technology from the West. As noted earlier, their many-sided assault on the efficiency problem has had little success thus far.

We now turn to an examination of some of the possible sources for increased productivity. During the next decade, the Soviet Union should continue to benefit from two factors that have boosted productivity in the past--an improved ratio of males to females in the labor force and rising educational attainment of the population. However, both of these sources will contribute less to economic growth through improved quality of the labor force than in the past. The ratio of males to females in the population aged 16 years and over increased by 7.1 percent during the 1950's, by 5.8 percent during the 1960's, and is projected to rise by 5.6 percent during the 1970's (30). In 1950, the average educational attainment of the population aged 16 and over was a mere 5.0 years; the level increased to 5.9 in 1960 and 7.3 by 1970, and it is projected to rise to 8.1 by 1980 (31). The total percentage increases in attainment for the three decades are 18.0, 23.7, and 11.0, respectively.

Productivity gains also will continue to come from shifts of the labor force out of agriculture and into other sectors of the economy, where output per worker is much higher. In this area, too, the gains that can be achieved in the 1970's are unlikely to match those in the past two decades. Unless some radical breakthrough in agricultural productivity can be made, the rate of decline of agricultural employment seems unlikely to be much greater than that achieved in the preceding two decades--about 7 percent per decade. Soviet rates of outmigration from agriculture have been slow by comparison with Western countries; nearly one-third of the labor force was still tied up in agriculture in 1970. Furthermore, a larger share of the labor that is transferred out of

farming in the 1970's is likely to go into the service sectors, rather than into industry and construction, where output per worker is much higher.

Potentially, productivity could be boosted considerably by a substantial upgrading of the average level of technology used throughout the economy, but principally in industry and agriculture, which together account for nearly three-fifths of GNP. The rate at which the badly needed modernization can occur, however, will be adversely affected by the probable continued slowing of the rate of investment. Moreover, the reduced availability of investment funds is likely to sharpen the competition for their allocation. Large potential gains could be made through imports of modern plants and equipment from the United States, Western Europe, and Japan. Indeed, imports of machinery and equipment from these countries have totaled more than $6 billion since 1965 and orders for an additional $2 billion were placed in 1972 (32). From all indications, the USSR hopes to continue these large imports of high-technology products with the use of long-term credits. This process would seem to have near-term limits, however, governed by the growing size of the USSR's hard currency debt, the annual size of debt service, and the difficulties that the USSR has long had in finding exportable goods that Western countries will buy.

Imports of machinery and equipment from the West in themselves undoubtedly are important to the growth of efficiency, since they raise the average level of industrial technology in a physical sense. At least as important, however, is the speed with which these new plants and machines are put into operation and the effectiveness with which they are used. The imported, high-level technology will be operated in the Soviet institutional environment. At present, this means that the effectiveness of the new technology will be influenced to an important extent by the modus operandi of the Soviet system of economic administration. Payoffs will come later rather than sooner, and the actual returns will be well below potentials.

As the record of the past two decades indicates, socialist central planning and administration of the economy by Government bureaus has proved to be unsuited to dealing with problems of generating rapid technical change and satisfying the wants of an increasingly sophisticated populace. The economic reforms of 1965 were aimed at modifying institutional arrangements so as to handle these critical tasks better. Not only have these "reforms" left all essentials of the old system intact, but they have added greatly to the complexity of incentives and to the bureaucratization of economic life.

As a spur to efficiency, the leadership is now pushing the merging of industrial enterprises into large associations (33). Even granting that these new amalgamations will be generally established, against the present resistance of both enterprises and ministries, the potential payoff does not seem great. After all, the associations will operate in the same economic and institutional environment as did their constituent enterprises. There are no indications at present of any major changes in this milieu. Indeed, recent pronouncements continue to stress the importance of central planning, taut plans, and the need for greater controls and discipline. Soviet leaders now seem to be convinced that improved central planning and administration can be achieved through ever-greater use of computers. Given the present state of the art in the Soviet Union, one may be justifiably skeptical about the possibilities of any

significant breakthroughs in overall economic efficiency from the use of computers to maintain the bureau-administered economy.

In short, major institutional changes do not seem in the offing in the near term. Even if some radical new approach should be adopted, such as a large expansion of the permissible scope of private activity or the introduction of genuine markets in some sectors of the economy, the potential payoffs in greater efficiency and consumer satisfaction could hardly come quickly. With regard to the consumer welfare-worker incentive problem, the leadership seems to believe that its present policies of providing slow but steady improvement across the board, coupled with such a spectacular program as "cars for the people," will avoid serious trouble on the home front.

This abbreviated survey of the potential sources for productivity growth in the 1970's, together with the poor average performance during 1971-73, suggest that the Soviets can hardly maintain even the average rate of growth of GNP achieved during the 1960's (5.4 percent). If productivity rises by no more than 1.0 percent annually, and the labor force and the capital stock together rise by no more than the rate of 4.0 percent annually that seems a likely upper limit barring major changes in policy, GNP could increase about 5 percent annually. These are optimistic projections, and the annual growth of GNP could well be less, perhaps as low as 4 percent.

While these projections would represent a continued trend toward lower rates of economic growth, average rates of 4 to 5 percent annually are substantial, nevertheless. Rates of this size will not allow the Soviets to win any "growth races" soon or to narrow the technology gap with the West, but they will permit a continued slow but steady rise in the level of living in the USSR, even though it will remain drab by Western standards. They will also, of course, permit the continuance and expansion of expensive military programs. In words often used by Lenin, "in the final analysis," these two considerations may well carry the most weight with a leadership determined to retain political power and stability in a comparatively closed society where authoritarian controls are traditional and well established.

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USSR HARD CURRENCY BALANCE OF PAYMENTS

By Robert S. Kovach

BACKGROUND

All the developed Western countries except Finland trade with the USSR in convertible currency, so this discussion equates Soviet hard currency trade with Soviet-Western trade. Soviet two-way trade now exceeds $35 billion. The developed West accounts for about one-fifth of the total. The USSR has expanded its imports from the West but has been unable to generate a corresponding expansion of its exports to the area. As a result, the USSR has consistently run a deficit. 1/

The Soviet trade balance in hard currency has been in deficit for more than a decade, averaging about $250 million annually during 1960-71 (table 1). Until the mid-1960's, these deficits were financed primarily by gold sales. By the end of 1965, Soviet gold reserves were down to about 1,000 tons.

After 1965, Western government-guaranteed medium- and long-term credits applied to Soviet purchases of capital goods replaced gold as the chief element in financing Soviet deficits. In 1966-71, Soviet gold sales were virtually nil and reserves grew to an estimated 1,900 tons by the end of 1971, but Soviet medium- and long-term debt to the West (on government-guaranteed credits) apparently grew to more than $2 billion (table 2). In 1971 debt service (principal and interest) took about 17 percent of Soviet hard currency exports.

CURRENT DEVELOPMENTS

Two developments have dramatically changed the dimensions of the Soviet hard currency problem since 1971. A mediocre harvest in 1971 followed by a poor harvest in 1972 forced the USSR to purchase large quantities of grain and other agricultural products to sustain Brezhnev's program for upgrading the Soviet diet. At the same time, a disappointing performance in the economy convinced the leadership that substantially greater Western help would be needed to upgrade the level of Soviet technology.

In 1972 the trade deficit rose abruptly to a record $1.4 billion. Exports grew from $2,650 to $2,815 million. They would have declined if the U.S. dollar had not been devalued. Imports rose an unprecedented $1.2 billion--from $2,955 million to $4,171 million. 2/ Large imports of grain--about $750 million worth--and other agricultural products accounted for much of the deficit, but imports

1/ Deficit refers to the merchandise trade deficit. Several elements of the current account cannot be estimated. Those that can, such as tourism and interest on loans, indicate that the merchandise trade balance does not differ substantially from the balance on current account.

2/ In the absence of the devaluation, imports would have grown about $900 million--also an unprecedented increase.

Table 1. USSR hard currency trade deficit and gold sales, 1960-72

Year	Hard currency			Gold sales 1/	
	Exports	Imports	Balance 2/	Value	Quantity
	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Tons
1960	739	1,018	-279	200	180
1961	866	1,059	-193	300	270
1962	912	1,179	-267	215	195
1963	969	1,279	-310	550	500
1964	1,011	1,544	-533	450	410
1965	1,331	1,546	-215	550	500
1966	1,479	1,746	-267	3/	3/
1967	1,688	1,604	+84	15	14
1968	1,896	2,004	-108	12	11
1969	2,109	2,422	-313	3/	3/
1970	2,182	2,699	-517	3/	3/
1971	2,646	2,955	-309	3/	3/
1972	2,815	4,171	-1,357	250-300	150

1/ Calculated at the official rate of $35 an ounce for sales in 1960-68 and estimated free market prices subsequently. Dollar values of gold sales are taken from Bank for International Settlements sources.
2/ Based on official Soviet data.
3/ Negligible.

of machinery and equipment and steel pipe also rose. Exports of oil--the USSR's main hard currency earner--declined slightly, 3/ while some other traditional exports such as grain, sugar, coal, ferrous metals, and ores declined or did not increase.

The USSR's hard currency deficit apparently was even greater in 1973, largely because much of the grain purchased in 1972 was delivered in 1973. The USSR probably imported at least $1.5 billion in agricultural products (chiefly

3/ Oil exports might have declined even more were it not for Soviet imports of oil from the Middle East.

Table 2. Estimated Soviet drawings and scheduled repayments on Western government-guaranteed medium-term and long-term credits, 1966-72 1/

Year	Estimated drawings	Scheduled repayments	Interest	Net credits	Outstanding debt at end of year
	Million dollars				
1966	275	150	20	105	505
1967	305	152	29	124	658
1968	510	217	38	255	951
1969	630	265	57	309	1,316
1970	700	300	79	321	1,717
1971	700	360	103	237	2,057
1972 2/	1,030	438	124	468	2,649

1/ Derived from a variety of sources, both Soviet and Western. Average terms on credits are 6 percent interest and 8 years.

2/ Includes drawings on 3-year Commodity Credit Corporation credits.

grain, but also soybeans, sugar, and butter) and about $1.5 billion in machinery and equipment. Hard currency imports may have totaled $5 billion. The expected increase in exports in 1973 was small and the hard currency deficit may have reached $2 billion. More than half of the deficit was with the United States, which delivered $1 billion in grain and $200 million in machinery and equipment to the USSR.

FINANCING THE DEFICIT

To cover the 1972 deficit the USSR relied chiefly on credit. Government-backed net medium- and long-term credits amounted to about $500 million, mainly to pay for imports of machinery, equipment, and pipe. About $100 million of Commodity Credit Corporation (CCC) 3-year credits were drawn to finance grain purchases from the United States. As a result of its extensive borrowing in 1972, total outstanding debt on government-backed credits climbed to about $2.6 billion. Finally, the USSR tapped the Eurocurrency market for several hundred million dollars in both medium- and short-term credits to finance imports of machinery and grain. To cover that part of the deficit not financed by credits or drawdowns in hard currency holdings, the USSR sold gold in substantial quantities for the first time since 1965. Sales of about 150 tons earned the USSR $250-$300 million. Gold reserves stayed at roughly 1,900 tons because sales were roughly equal to net output.

In 1973 the USSR took advantage of high gold prices (and generally avoided high interest rates in the Eurocurrency market) in financing its hard currency deficit. According to press reports, the USSR sold about 200 tons in the first half of the year. At then current prices this probably earned the Soviets about $600 million. Higher prices--in the neighborhood of $120 per ounce--in the summer of 1973 may have brought additional Soviet gold into the market. If the USSR sold another 100 tons during that period, that would have meant an additional $400 million or so. Gold prices have been closer to $100 an ounce since that time.

In any event, gold sales apparently have given the USSR a substantial boost this year. If the USSR sold $1 billion in gold in 1973 to help cover a $2 billion deficit, credits would have had to cover the remaining $1 billion. Government-backed Western credits (net of repayments and including $400 million in CCC credits for grain) provided another $700 million. As a last resort the USSR would have had to pay the high interest rates for nonguaranteed loans to finance the deficit not covered by gold sales and government-guaranteed credits. Thus, the burden of the USSR's recent currency deficits was lightened considerably by easy access to Western credits and by the windfall arising from the sharp increase in the price of gold. In addition, dollar devaluations permitted the substantial Soviet borrowing on the Eurodollar market in 1972 to be repaid by cheaper dollars. And if it's true that the USSR has been getting hard currency for arms shipments to Middle Eastern countries, the Soviets have had a very good year in financial terms.

LONG-TERM PAYMENTS PROBLEMS

In view of the record harvest in 1973, Soviet outlays for agricultural products and the hard currency trade deficit will be substantially smaller in 1974. Expenditures for Western grain are expected to be about $500 million unless another poor harvest sends Soviet grain buyers out for more grain. The payments problems will not disappear, however, because medium- and long-term debt continues to grow. The growing Soviet appetite for Western equipment and technology should keep imports at a high level. Imports of machinery and equipment, which rose sharply in 1972 and 1973, will continue to increase because of the growing volume of new contracts concluded in the past 2 years. An even larger share of these imports is currently being financed by credit than was the case in earlier years.

Service payments on the growing Soviet debt to the West have been increasing rapidly. In 1967 debt service took about 11 percent of Soviet exports to hard currency countries, in 1972 about 20 percent, and in 1973 more than 25 percent. 4/ In 1974 the debt service ratio may be even higher. The growth of Soviet exports to hard currency countries during the balance of the decade may be no more than about 7 percent annually. 5/ Exports will continue to be made up largely of the traditional fuels, raw materials, and semimanufactures--oil, gas, timber,

4/ In 1973 Soviet hard currency exports are estimated at roughly $3.1 billion.
5/ Assuming a 100 percent increase in the price of oil and increased prices on other raw material exports. This may prove to be too small. Recent price quotations suggest much higher prices in 1974 and 1975.

ores, metals. Because of increasing internal demand and limitations on supply, oil exports--the USSR's chief foreign exchange earner--will increase only moderately, largely because of higher prices rather than of greater volume. Despite Brezhnev's expressed hope that the USSR will export more processed and manufactured goods, notable successes in this area are not expected during the 1970's. If exports do not grow substantially faster, the USSR may decide to reduce its borrowing in the West to hold the ratio of debt service to exports within what it considers to be reasonable bounds. Since repayments on past credits will continue to rise for some time, there would then be a shift from a net inflow to a net outflow of funds on capital account.

Because Western machinery and equipment has such a high priority, the USSR probably will try to prevent a credit squeeze from interfering with imports. The USSR has the option of selling about 200 tons of gold annually during the 1970's without reducing gold reserves. Sales of this magnitude would help cover expected deficits during the period. The USSR could sell even more gold and accept some reduction in its reserves. Nevertheless, the USSR may have to curtail the growth of imports if gold sales prove to be insufficient to bridge the gap between exports and imports. Earnings from invisibles--mainly from tourism and transportation--will probably increasingly offset outlays, but these will make a minor contribution to hard currency revenues. The USSR probably hopes that by the beginning of the 1980's exports will be helped by the large-scale fuel and raw material projects now being discussed with Western firms.

SELF-LIQUIDATING CREDITS

In the past the USSR has used Western machinery mainly to upgrade production for domestic use. Now the USSR is trying to use some of the Western equipment and technology for export expansion. Specifically, it has endeavored to repay credits with the products of the installation built with the credits and has sought contracts for exports of these products in excess of repayments. The credits involved in these projects thus will be self-liquidating and will result in net hard currency earnings for the USSR. Work is under way on about a half dozen such projects--with the Japanese (timber projects and port development) and several West European countries (gas for pipe). The USSR will have drawn roughly $1 billion in such credits by the end of this year and repaid about $300 million. Of the estimated debt outstanding on government-backed credits of $3.5 billion by the end of 1973, some $800 million will be of the self-liquidating type. By the time these credits are amortized in 1984, the projects involved will have earned the USSR roughly $700 million over and above repayments.

Projects recently approved include an $8 billion agreement with a U.S. firm which calls for the long-term barter of Soviet ammonia, urea, and potash for U.S. superphosphoric acid and $400 million of U.S. chemical plant, equipment, and associated technology. U.S. equipment probably will be exported on long-term credit. According to another Soviet contract, an Italian firm, Montedison, will export several hundred million dollars' worth of chemical equipment on credit in return for ammonia and other chemicals. A $100 million petrochemical plant and a pulp plant will be delivered on credit by French companies to be repaid in products of the plant.

U.S. firms are discussing several additional ventures with the Soviets. Three U.S. companies have signed a letter of intent to assist in building a natural gas pipeline and liquefaction plant in western Siberia. A petroleum company and a natural gas company have signed a preliminary agreement for a similar project in eastern Siberia which apparently will also involve substantial Japanese participation. U.S. and Japanese firms are also considering the exploration of Sakhalin Island for off-shore oil and natural gas deposits.

Negotiations between the USSR and Japan over the construction of a trans-Siberian oil pipeline originating at the Tyumen oil fields are continuing. Other Western ventures under discussion between the USSR and non-U.S. firms include the construction of an iron-ore reduction complex requiring up to $650 million in West German plant and equipment and the development of Siberian coal deposits with upwards of $600 million in Japanese assistance. The Soviets have also discussed the development of Udokan copper deposits with France and Japan, and talks with Sweden have been initiated concerning future Swedish imports of Soviet natural gas. Soviet exports resulting from these cooperative ventures would be substantial in the 1980's.

OUTLOOK FOR U.S.-SOVIET TRADE

The United States had the largest increase in trade with the USSR in 1972 among Western countries, more than tripling its trade turnover and becoming the fifth largest Soviet hard currency trading partner. The U.S. trade surplus with the USSR--$466 million--was equal to one-third of the Soviet hard currency deficit. The United States in 1973 might be the largest Soviet trading partner in the West, with agricultural deliveries valued at about $1 billion and machinery and equipment at $200 million. The surplus will be about $1 billion because imports will probably be no greater than $200 million.

The U.S.-Soviet detente has opened up a large new area of credits for the USSR, and the USSR has made extensive use of them in the first year of large-scale trading with the United States. With $500 million in CCC grain credits, Export-Import Bank participation in machinery credits--principally for contracts for the Kama truck plant--and private, nonguaranteed bank credits, the USSR has received a substantial volume of U.S. credits.

With detente the United States will continue to have a major share of Soviet hard currency trade and financing in the future. Soviet orders for plants and equipment from the West continue to increase, and the United States is receiving a large proportion of them. The large-scale proposals for exploiting fuel and raw material deposits that are being discussed with U.S. firms would, if adopted, give the United States a surplus in its trade with the USSR for most of the 1970's. Finally, the requirements of the Brezhnev program may force the Soviets to buy grain consistently over the next several years, and the United States should receive a large share of these orders.

THE SOVIET FEED-LIVESTOCK ECONOMY: PRELIMINARY FINDINGS ON PERFORMANCE AND TRADE IMPLICATIONS

By David M. Schoonover

The Soviet Union is likely to require continued imports of grains and oilseeds during the next decade if it is to sustain a livestock program reasonably consistent with consumer demands. However, if it adopts a policy of feed self-sufficiency, increased feed production during the next decade could permit moderate increases in per capita consumption of livestock products. Projected feed imports are likely to be realized, therefore, only if central planners attempt to attain reasonable satisfaction of apparent consumer demands for livestock products. Such an attempt apparently is now supported by policy-makers.

Rapid increases in Soviet grain production are to be expected in the 1970's as the USSR undertakes a massive program of grain fertilization. Soviet grain production may well be around 240 to 250 million tons by 1980 and 270 to 280 million tons by 1985--given the usual assumption of normal weather in those years. Nevertheless, a sizable gap between Soviet feed energy requirements and availabilities from domestic production is likely to occur during the next decade. Recent trends in yields, together with possibilities for area expansion, suggest that growth in forage production probably will constitute the principal brake on acceleration of overall feed energy growth.

Soviet rations have been chronically deficient in digestible protein. Possibilities for increased production of oilmeal from expanded oilseed output appear quite modest in relation to the protein deficit. Other high-protein sources now account for a very small share of protein in feeds. Therefore, a substantial share of Soviet feed imports probably will consist of oilseeds or oilseed meals.

Projected feed requirements are based on an increase in per capita meat demand to 63 kilograms in 1980 compared with consumption of 44 kilograms in 1970. If attained, this would be more than twice the amount of increase, in absolute terms, that occurred during the previous decade. Per capita milk and egg consumption also are expected to advance more during the 1970's than during the 1960's. Income elasticities of demand for beef, poultry, butter, and eggs apparently are quite high in the USSR, although not out of line with those in other countries at roughly similar levels of development.

The above remarks refer generally to the next decade, and the underlying assumption is that normal weather will prevail. One of the most certain features of Soviet agriculture, however, is that weather is uncertain. High levels of production of grain and other feeds in 1973 have temporarily eased the strain on feed resources. The USSR may add about 25 million tons of grains to stocks, if current trade estimates are approximately correct. If another record year in 1974 follows the 222.5 million ton grain crop in 1973, a sufficient grain reserve could be accumulated to enable the Soviet leadership to

discount the need for feed grain imports. Without the pressing need to import feed energy, the USSR still could import oilseeds or oilmeals to improve the protein balance. If a relatively poor grain crop of less than 190 million tons is harvested in 1974, grain stocks probably would be drawn down sharply unless imports were made. Two poor crops in succession could so severely affect feed resources that a cutback of the entire livestock program would be necessary. For the near future, Soviet policymakers and the Soviet consumer appear to be largely vulnerable to the whims of nature.

These conclusions and projections about feeds, livestock, and consumption in the USSR are the preliminary results of a detailed research project of ERS on the Soviet feed-livestock economy. In this paper I will attempt to present a brief description of the research undertaken, the findings in the principal areas of the research, and a few words of caution about the wide range of uncertainty in projections based on work of this nature. I will maintain, however, that the general conclusions reached are valid, although any precise production, consumption, or trade number projected would fail most statistical tests of significance.

Any attempt to project USSR feed trade would seem to require extreme foolhardiness. The USSR has published relatively little historical information on feed supply and utilization, livestock product demand, and foreign trade criteria. Projection of the future is a hazardous undertaking, even when the past is well documented. Analysis of past relationships in the Soviet feed-livestock economy, however, even based on fragmentary data, enables one to draw general conclusions about livestock and feed developments.

Although at the expense of great oversimplification, it is possible to delineate three principal areas of uncertainty in the analysis and projection of relationships in the Soviet feed-livestock economy. The first area is the determination and projection of planners' and consumers' demand functions for livestock product consumption. The second area comprises the production function relationships between feed inputs and livestock product output. The third area is the analysis of resource and technological developments affecting past and future feed supplies. For this study, USSR foreign trade in livestock products (except wool) has been assumed to be relatively insignificant. This assumption enables a better focus on the feed trade implications of livestock product demand, but should be analyzed in future research.

DEMAND ANALYSIS AND PROJECTIONS

The basic premise of the demand projections is that Soviet central planners will attempt to supply livestock product output in quantities adequate to meet demonstrated demand. Demonstrated demand refers to income elasticities calculated from regression of per capita consumption of individual commodities on per capita disposable personal money incomes in the USSR.

It can be argued that demonstrated demand greatly understates true consumer demand in the USSR. The USSR traditionally has been an economy of queues and shortages. Repressed inflation in the economy is probably demonstrated by the rapid rise in consumer savings since the mid-1960's, as well as by observed

shortages of commodities. For most livestock products, however, even calculated demonstrated demand elasticities are relatively high by the standards of the developed world. The USSR income elasticities of demand utilized in these projections for several livestock products are compared in table 1 with elasticities in the United States and six countries in Southern, Eastern, and Western Europe. International comparisons of per capita national income are nebulous, but the USSR is generally believed to be roughly on the same level as Italy in Western Europe and between Czechoslovakia and Hungary in Eastern Europe. The elasticities are taken from the FAO agricultural projection study published in 1971 (10). 1/

Table 1--Income elasticities of demand for major livestock products in the USSR and selected countries, 1965 1/

Country	Total meat	Beef	Pork	Poultry meat	Eggs	Butter
USSR 2/	3/.69	.83	3/.40	.89	.66	.59
Italy	.71	.80	.50	.80	.50	.40
Spain	.67	.80	.60	1.00	.60	.50
Czechoslovakia	.47	.50	.40	.80	.40	.20
Hungary	.65	.70	.60	.70	.50	1.00
West Germany	.43	.50	.40	.60	.30	.20
France	.41	.40	.40	.50	.20	.20
United States	.24	.50	-.20	.30	-.10	-.50

1/ Except for the USSR projections, elasticities are from FAO (10).

2/ The FAO study used roughly similar elasticities in the USSR projections on pork, eggs, and butter. The lower elasticities used on other commodities were: total meat, .50; beef, .60; and poultry, .70.

3/ Demand elasticities calculated in the regression analysis were: total meat, .53; and pork, .30.

A double-logarithmic regression model of per capita consumption on incomes during 1955-71 was used in the analysis and projection of consumption of beef, mutton, poultry meat, and butter. The estimated regression line was shifted downward beginning in 1962 by use of a dummy variable to reflect retail price changes in that year. Retail prices in State stores have been held constant since 1962. A similar model for 1962-71 (without the price dummy) was used for eggs. Consumption of other dairy products was related to income by a semi-logarithmic model. Although similar models were constructed for pork consumption, a higher elasticity was arbitrarily selected in view of elasticities in most other European countries. In general, the selected elasticities are high,

1/ Underscored numbers in parentheses refer to References on p. 41.

but not out of line with elasticities in other countries at similar levels of development.

Per capita consumption was extrapolated to 1980 and 1985 on the basis of an assumed rate of growth of per capita disposable money incomes. The double logarithmic model, in general, is more suitable for relatively short-term projections, so the 1980 values probably can be considered a reasonably good indication of expected consumer demand (in the demonstrated sense), but the 1985 values are no more than a measure of possible consumption assuming a continuation of trends. A leveling off of consumption growth between 1980 and 1985 may be a more realistic assumption.

In contrast to relatively high assumed demand elasticities, the selected income growth rate used in the projections may be conservative. A constant 5 percent annual rate of growth in per capita incomes from 1970 through 1985 was employed. This rate roughly corresponds to growth in 1971 and 1972, but historical rates have been higher--averaging 6.4 percent during the 1960's. Some resumption of higher growth rates may occur in the 1970's. The series derived by Bronson and Severin was used for historical income data (5). Population projections, assuming constant fertility at the current level, were taken from Leedy in the same compendium (13).

Specific projections of per capita livestock product consumption in 1975, 1980, and 1985 are compared in table 2 with actual 1970 consumption, Soviet plans for 1975, and Soviet long-range consumption norms. Note that 1975 projections in this study approximate the 1975 plan levels. The rather optimistic 1985 projections on total meat and milk approach the long-range norms and projected beef consumption greatly exceeds the norm. Other information on planned beef expansion, however, suggests that planned levels of beef consumption will reach the so-called norm in the near future. Perhaps a revised norm can be expected shortly.

How do these projected levels of consumption compare with consumption in other countries? Compared with the United States, even projected 1985 levels of Soviet per capita consumption fall far short of recent U.S. consumption, although Soviet milk consumption, because of the high proportion of butter, already exceeds U.S. consumption. Compared with more advanced European countries, projected 1985 consumption of meat and eggs in the USSR is approximately on the same level as 1970 consumption in West Germany and Czechoslovakia. Milk and butter consumption levels are roughly comparable to those of Czechoslovakia, but Soviet butter consumption is not projected to reach recent West German levels until the 1980's. On the other hand, Soviet consumption of meat and eggs in 1970 placed only modestly behind Italy and butter and total milk consumption was far greater.

Before leaving this rather detailed discussion of the demand analysis, it is worthwhile to return to the original premise: Soviet central planners will attempt to supply livestock product output in quantities adequate to meet demonstrated demand. Certainly, if this goal is unattainable because of limitations in domestic or foreign exchange resources or because it is usurped by higher priorities, the Soviet consumer will have little market power to influence results. Central planners can restrain demand expansion through several alternative courses of action:

Table 2--USSR: Per capita consumption of livestock products in 1970, projections for 1975-85, plans for 1975, and norms

Year	Meat				Milk 2/		Eggs
	Total 1/	Beef	Pork 1/	Poultry	Total 2/	Butter	
	Kilograms						Number
Actual, 1970	44	21.2	13.3	4.4	307	5.0	159
Projections:							
1975	53	27.2	15.6	5.3	345	5.6	186
1980	63	33.4	18.1	6.6	389	6.5	218
1985	75	40.9	20.9	8.1	431	7.4	257
Plans, 1975 3/	4/54	NA	NA	NA	340	NA	192
Norms, long-term 5/	4/77	31.1	NA	NA	434	NA	6/292

NA = not available.
1/ Excluding pork fat. 2/ Whole milk equivalent. 3/ Five-year plan (3).
4/ Official data adjusted by estimated 5 kilograms to exclude pork fat.
5/ Annual human consumption norms developed by the Institute of Nutrition, USSR Academy of Medical Sciences (8). 6/ (2).

1. Permit growing shortages and queuing or rationing;
2. Decelerate increases in disposable incomes through wage or tax policies;
3. Increase supplies of other consumer goods more rapidly;
4. Raise retail prices on livestock products.

An increase in retail prices could provide welcome relief to the Soviet budget makers, since livestock product consumption now is heavily subsidized to keep retail prices below production and marketing costs. The total subsidy level, as far back as 1969, was planned at 6.5 billion rubles, including 5.3 billion rubles on meat (9)--almost 5 percent of the State budget. Producer prices were further increased in 1970, although retail prices were held constant. Despite the probable popularity in the budget office of a retail price increase, Soviet policymakers appear reluctant to needlessly antagonize the populace. This concern was probably strengthened by the disturbances in Poland over a similar issue during the winter of 1970/71. Neither shortages nor restrictive income policies seem likely to be popular, however, so the only viable alternative for restraining livestock product consumption appears to be expanded production of other consumer goods. This program is underway, but, in many areas, is slow and requires substantial resources also, so little relief is in prospect to check strong livestock product demand during the next several years.

LIVESTOCK PRODUCTION AND FEED REQUIREMENTS

Probably the most difficult and least satisfactory part of any feed-livestock economy study is the treatment of changes (or lack of changes) over time in the physical production function relationships between feeds and livestock product output. Feed balances in most countries are inadequate to accurately measure the changes over time in input-output ratios for specific feeds and livestock products. Another problem is determining the degree of substitutability among feeds, such as roughages and concentrates, and finding a common denominator for feeds with different proportions of energy values and digestible protein. In the Soviet case, there are no published data giving the distribution of feeds among types of livestock. Data sources on feeds utilized by all classes of livestock give only totals on concentrates plus a few broad categories of roughages, a pasture estimate, and a total on all feed units. These data are for calendar years, rather than crop consumption years.

Data on individual feeds utilized by crop consumption years were estimated by constructing commodity supply-utilization balances and comparing results with the few published calendar year data on feeds and feed units fed. Although this seems elementary, there is no published official or other Soviet grain balance series giving even the broad categories of utilization. Non-Soviet estimates of the USSR grain balances frequently have dealt with a few isolated years, and have not provided a time series of balances. Where comparisons are possible, these estimates appear to differ sharply.

The balances of total grain and wheat utilization developed in this study are shown in tables 3 and 4. Stock changes shown in the balances are residuals subject to cumulative estimating errors. The quantities of grain fed by consumption (or marketing) years can be adjusted to a calendar year basis by a process of partial lagging. They are then consistent with data in the official Soviet series on concentrates fed less quantities of other concentrates derived in similar balances. Although energy substitution values of feeds were compared by converting all feeds into Soviet oat-equivalent feed units using Soviet feed unit norms (12), the calculated concentrate feed unit series generally appeared to exceed apparent Soviet calculations of concentrate feed units roughly by 10 percent. The grain and other concentrate series were adjusted by an arbitrary 10 percent reduction in aggregate concentrate feed unit and digestible protein values.

Data on roughage availabilities and utilization by consumption years probably are even less reliable than data on concentrates. Production series have not been published, at least since the 1950's, on silages except for corn (even the corn silage series includes green chop), feed melons, sugarbeet pulp, and other processing byproducts. The Soviets publish data on total quantities of silage and hay fed and in 1971 made available to a U.S. Feed-Livestock Delegation data on several other feeds, such as potatoes, feed roots and melons, green chop, and skim milk (7). Consumption year series were derived by applying the long-term relationship between production and feed use to the available production series. Such a methodology is admittedly crude. Calculated feed units from succulent-type roughages were consistently lower than apparent Soviet calculations and were arbitrarily adjusted upward by 25 percent in an attempt to maintain an appropriate relationship between concentrates and roughages in the feed balances.

Table 3.--USSR: Grain balance 1/, 1955/56-1973/74

Year	Supply				Distribution						Stock change
	Total	Production	Imports	Exports	Total	Dockage and waste 2/	Seed	Manufacture	Food	Feed	
	Million metric tons										
1955/56	101.8	103.7	1.7	3.6	102.4	10.4	19.1	2.7	44.6	25.6	-0.6
1956/57	120.5	125.0	0.9	5.3	109.6	12.5	18.5	3.2	43.8	31.7	10.9
1957/58	98.0	102.6	1.5	6.1	108.8	10.3	18.3	3.0	43.4	33.9	-10.8
1958/59	128.8	134.7	1.7	7.6	116.9	13.5	17.6	3.1	43.3	39.5	11.9
1959/60	113.9	119.5	1.0	6.6	115.6	12.0	18.4	2.7	43.0	39.5	-1.7
1960/61	119.3	125.5	0.8	6.9	119.4	12.6	19.9	2.7	42.4	41.7	-0.1
1961/62	123.5	130.8	0.8	8.1	126.4	13.1	21.4	2.6	44.0	45.4	-2.9
1962/63	132.7	140.2	0.6	8.0	130.1	14.0	23.0	2.2	48.2	42.7	2.6
1963/64	113.4	107.5	10.4	4.6	115.0	10.8	23.3	2.3	45.5	33.0	-1.6
1964/65	150.6	152.1	2.6	4.0	128.9	15.2	22.2	2.5	44.6	44.5	21.7
1965/66	125.1	121.1	9.0	5.1	138.6	12.1	23.8	2.5	44.3	55.8	-13.5
1966/67	169.9	171.2	3.9	5.1	147.1	17.1	23.6	2.6	44.1	59.7	22.8
1967/68	143.9	147.9	2.3	6.2	149.2	14.8	23.6	2.7	44.0	64.2	-5.3
1968/69	163.9	169.5	1.2	6.9	160.7	17.0	24.6	2.7	44.5	72.1	3.2
1969/70	157.2	162.4	1.8	7.0	170.6	16.2	23.2	2.8	44.9	83.4	-13.4
1970/71	179.6	186.8	1.3	8.4	183.3	18.7	24.8	2.8	45.3	91.7	-3.7
1971/72 3/	182.6	181.2	8.2	6.8	(188.0)	18.1	26.4	(2.9)	(45.6)	(95.0)	(-5.6)
1972/73 3/	(187.1)	168.2	(21.5)	(2.6)	(188.2)	16.8	(26.4)	(2.8)	(45.2)	(97.0)	(-1.1)
1973/74 3/	(227.6)	222.5	(10.7)	(5.6)	(201.7)	22.2	(26.5)	(3.0)	(45.0)	(105.0)	(25.9)

1/ Including pulses and rice.
2/ 10 percent of production.
3/ Preliminary estimates in parentheses.

Table 4.--USSR: Wheat balance, 1955/56-1973/74

Year	Supply				Distribution						Stock change
	Total	Production	Imports 1/	Exports 1/	Total	Dockage and waste 2/	Seed	Manufacture	Food	Feed	
	Million metric tons										
1955/56	45.8	47.3	0.4	1.9	48.8	4.7	10.7	1.4	31.7	0.4	-3.0
1956/57	64.6	67.4	0.2	3.1	54.6	6.7	10.8	1.7	31.2	4.1	10.0
1957/58	54.3	58.1	0.4	4.2	63.7	5.8	10.5	1.6	30.9	15.0	-9.4
1958/59	70.8	76.6	0.4	6.1	59.7	7.7	9.9	1.6	30.9	9.7	11.1
1959/60	63.6	69.1	0.1	5.6	65.2	6.9	10.4	1.2	30.7	16.0	-1.6
1960/61	59.9	64.3	0.6	5.0	59.3	6.4	10.8	1.2	30.3	10.6	0.6
1961/62	61.7	66.5	0.2	5.0	64.6	6.6	11.6	1.0	31.6	13.8	-2.9
1962/63	65.6	70.8	0.2	5.5	63.5	7.1	12.5	0.8	34.9	8.1	2.1
1963/64	56.9	49.7	9.7	2.5	55.6	5.0	12.6	0.8	32.7	4.6	1.3
1964/65	74.7	74.4	2.2	2.0	63.0	7.4	12.5	0.8	33.2	9.0	11.7
1965/66	65.9	59.7	8.5	2.4	74.5	6.0	13.7	0.8	33.1	20.9	-8.6
1966/67	99.4	100.5	3.1	4.2	76.0	10.0	13.5	0.8	33.0	18.6	23.4
1967/68	73.8	77.4	1.5	5.1	78.8	7.7	13.5	0.8	33.2	23.6	-5.0
1968/69	88.3	93.4	0.2	5.3	75.9	9.3	14.4	0.8	33.4	27.8	2.4
1969/70	75.2	79.9	1.1	5.8	87.6	8.0	13.2	0.8	34.2	31.4	-12.4
1970/71	93.0	99.7	0.5	7.2	97.0	10.0	13.8	0.8	35.0	37.4	-4.0
1971/72 3/	96.4	98.8	3.4	5.8	(101.2)	9.9	13.9	(0.8)	(35.3)	(41.3)	(-4.8)
1972/73 3/	(98.5)	85.8	(15.2)	(2.5)	(99.5)	8.6	(13.5)	(0.8)	(35.1)	(41.5)	(-1.0)
1973/74 3/	(109.7)	109.7	(5.0)	(5.0)	(92.5)	(11.0)	(13.8)	(0.8)	(35.0)	(31.9)	(17.2)

1/ FAS estimates.
2/ 10 percent of production.
3/ Preliminary estimates in parentheses.

The aggregated total and concentrate feed units were distributed among livestock on the basis of the few available aggregate statistics on feeding rates. Total feed units per unit of milk output, unit of beef and pork liveweight gain, and standard animal unit on collective and State farms have been published for 1962-70 (18). Recent aggregate data on total and concentrate feed use per unit of output of milk, beef, pork, poultry meat, and eggs on collective and State farms were reported by a member of the Soviet agricultural academy (6). Other sources give feeding norms and feeding rates of selected groupings of farms.

Total feed- and concentrate-consuming livestock production units similar to those in use in U.S. feed balance statistics (1) were constructed by weighting major categories of livestock product output and horse inventories by feeding rates for 1970 or other recent years. Aggregate total feed supplies were divided by aggregate livestock production units to determine patterns or trends in aggregate feeding rates. The results are shown in table 5. These calculations indicate that there has been very little change over time in aggregate feed consumption per total feed-consuming livestock production unit, but there has been a marked increase since the mid-1960's in concentrate use per concentrate-consuming livestock production unit.

The adopted methodology for deriving historical input-output coefficients in livestock production has the convenience of enabling aggregation of feeds in terms of energy and determination of changes over time in aggregate feeding rates. It suffers from an obvious weakness, however, by implicitly assuming that the relationship of feeding rates among different categories of livestock remains fixed over time. It seems likely that, in relation to the concentrate-milk input-output coefficient, coefficients on beef may increase over time as feeding in lots gains favor, but coefficients on pork and poultry may decrease as feeding technology and animal performance improves. The problem is not too serious for short-term historical analysis or projections. In longer range analysis, one can only hope that the offsetting impacts of these errors will be approximately equal. If historical data were available it would be desirable to develop a table of input-output coefficients by individual years and to project them separately, but in the absence of such data, further refinement may not be possible.

The calculated feeding rates in 1970/71 in terms of oat-equivalent feed units 2/ are shown in table 6. For perspective, the grain rates have been converted to barley-equivalents and compared in table 7 with rates calculated by the Organization for Economic Cooperation and Development (OECD) on feed grain use in selected countries in 1962 (16). The Soviet feeding coefficients generally appear reasonable in these comparisons, although the pork coefficient may be slightly higher than would be anticipated. The high requirement in pork production is probably associated with the long fattening cycle. A Soviet academician has noted that 12 to 13 months are required to produce an 85 to 90-kilogram meat-type hog, although with suitable breeds, feeding, and management, the cycle should be no more than 6.5 to 7 months (6). Similarly, he has stated

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2/ Oat-equivalent feed units may be converted to barley-equivalents by multiplying by 0.83 and to corn-equivalents by multiplying by 0.75.

Table 5.--USSR: Feed units per livestock production unit, 1955/56-1972/73

Year	Total feed			Concentrates		
	Feed units 1/	Livestock production units 2/	Feed per livestock unit	Feed units 1/	Livestock production units 2/	Feed per livestock unit
	Million tons	Millions	Quintals	Million tons	Millions	Quintals
1955/56.....	169.2	85.2	19.9	34.4	64.7	5.3
1956/57.....	189.2	93.2	20.3	40.5	72.9	5.6
1957/58.....	202.5	98.4	20.6	41.9	74.2	5.6
1958/59.....	238.5	107.4	22.2	48.8	80.7	6.0
1959/60.....	239.6	105.9	22.6	47.7	78.2	6.1
1960/61.....	265.3	105.2	25.2	50.7	80.7	6.3
1961/62.....	251.6	110.2	22.8	56.4	84.5	6.7
1962/63.....	246.2	112.7	21.8	54.5	86.1	6.3
1963/64.....	220.6	103.2	21.4	43.0	72.1	6.0
1964/65.....	274.4	117.5	23.4	56.6	87.0	6.5
1965/66.....	270.2	125.4	21.5	68.1	93.1	7.3
1966/67.....	295.2	134.2	22.0	72.5	97.0	7.5
1967/68.....	300.3	138.4	21.7	77.5	96.8	8.0
1968/69.....	308.4	137.6	22.4	86.2	97.5	8.8
1969/70.....	322.0	141.2	22.8	98.8	103.0	9.6
1970/71 3/....	(337.4)	146.9	(23.0)	(108.0)	111.5	(9.7)
1971/72 3/....	(328.8)	149.5	(22.0)	(112.3)	114.0	(9.9)
1972/73 3/....	(329.5)	(151.8)	(21.7)	(115.0)	(114.0)	(10.1)

1/ Consumption year data.
2/ Data for second of calendar years.
3/ Preliminary estimates in parentheses.

Table 6--USSR: Feed use in oat-equivalent feed units per kilogram of livestock production, 1970/71

Livestock product	Total	Concentrates	
		Total	Grain
	Kilograms		
Beef and veal	16.81	2.95	2.54
Pork (excluding fat)	13.71	11.59	9.97
Poultry meat	6.10	5.59	4.81
Milk	1.24	0.29	.25
Eggs 1/	3.98	3.63	3.12

1/ Per 10 eggs.

Table 7--Feed use of grain per kilogram of livestock production in the USSR, 1970, and selected other countries, 1962 1/

Country	Beef and veal	Pork 2/	Poultry meat	Milk	Eggs
	Kilograms				
USSR 3/	2.1	8.3	4.0	0.21	4.7
United States	3.0	8.3	4.4	0.30	3.9
West Germany	0.9	2.7	4.5	0.05	3.8
Italy	1.6	7.3	4.2	0.10	5.7

1/ Except for the USSR, data are from OECD (16), in terms of actual grain.
2/ OECD data are assumed to exclude pork fat.
3/ Grains in 1970/71 converted to barley-equivalent feed units.

that a 282-kilogram beef animal requires 24 months, but the desired performance is 380 to 420 kilograms in 16 to 18 months. Leading Soviet farms are now reporting considerably better performance, but the cited rates apparently still represent the typical performance on collective and State farms.

Feed energy requirements were projected to 1980 and 1985 by multiplying projected rates of feed consumption per livestock production unit times projected livestock production. On the assumption of no significant net trade in major livestock products (except wool), projected livestock production was directly related to the demand projections--generally making allowance for a small percentage of waste. The livestock product output projections for 1975 and 1980 are compared in table 8 with 1970 results and 1975 plans. Comparing the 1975 projections with plans, the principal difference is the lower output of pork in the projections. Pork output could exceed 1975 projections if hog numbers quickly recover from the 1972/73 setbacks due to 1972 crop failures. Likewise, although projected egg output is close to plan, both measures may understate actual results, which in the past couple of years have been outrunning plans and previous demand increases. In contrast, a demand-based projection of beef output seems to outrun actual plans.

Table 8--USSR: Production of major livestock products in 1970, plans for 1975, and projections for 1975 and 1980

Product	1970	Plans, 1975 1/	Projections	
			1975	1980
	Million metric tons			
Beef and veal	5.4	6.8	7.2	9.2
Pork (including fat)	4.5	6.1	5.5	6.7
Poultry meat	1.1	1.4	1.4	1.8
Mutton and goat meat	1.0	1.3	1.1	1.1
Other meat	0.3	0.4	0.2	0.2
Total meat	12.3	16.0	15.3	19.1
Milk	83.0	100.0	98.0	114.4
Wool	0.42	0.50	0.46	0.50
	Billions			
Eggs	40.7	52.0	51.1	63.2

1/ Plans are from (3), except for the plans on meat by types, which are from (19).

In view of the negligible calculated change in total feed per livestock production unit over the past 15 to 20 years, total feed per livestock unit in the projections was assumed to be constant at the 1960-71 average level. The 1955-71 uptrend in concentrate feed units per concentrate-consuming livestock unit was extrapolated to 1980 and 1985. As a consequence, in the projected

feed requirements the share of concentrates in total feed increases from 32 percent in 1970/71 to 39 percent in 1980/81 and 44 percent in 1985/86.

The digestible protein content of Soviet rations was also calculated by applying norm values of protein to the units of feed. According to these calculations, the ratio of digestible protein per oat-equivalent feed unit has improved only slightly during the past 15 to 20 years. It averaged only 97 grams in 1970/71. Based on a set of Soviet norms of digestible protein per feed unit consumed by different categories of livestock, the required ratio in 1970/71 was 107 grams. 3/ These calculations are crude, but were generally confirmed by a Soviet agricultural specialist, who stated that the average protein content was 94 grams in 1969 and the overall average norm is 104 grams (11). The calculated absolute protein deficit in 1970/71 was 3.5 million tons--roughly equivalent to the digestible protein content of 12 million tons of soybeans.

FEED PRODUCTION ANALYSIS AND PROJECTIONS

Without belaboring the discussion of feed commodity projections on a case-by-case basis, it is correct to conclude that projections were largely derived from linear extrapolations of national area and yield data.

The overall pattern of land use--total agricultural land, permanent pastures and meadows, cultivated land, and the distribution in fallow, grains, forages, and other crops--was extrapolated initially. A relatively short base period, 1966 to 1971 or 1972, was utilized because the major structural changes of previous years--such as the New Lands Program 4/ in the 1950's--caused wild gyrations in the extrapolations depending on the beginning period selected. The more recent period is believed generally to reflect more normal patterns that will continue to prevail in the next several years. Even this judgment had to be modified, however, by the sharp increase in grain area and the cutback in forages and fallow in 1973. The 1973 changes are generally believed to be shifts in the trend lines, rather than data to be incorporated in the trend lines. Consequently, the grain area trend (which has been a downtrend) was shifted upward by 8 million hectares and extrapolated from this revised position. Forage and fallow areas were adjusted accordingly, although the largest increment was eventually removed from forage rather than fallow.

Regression of grain yields on fertilizer use was attempted as an alternative to linear extrapolations. Except for isolated observations, however, the only fertilizer data are for usage on all crops. Consequently, although the statistical significance of the relationship between fertilizer and yields generally was found to be moderately good--the regression relationship for all major grains was significant at the 5 percent level--it was not noticeably

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3/ The percentage norms of digestible protein per oat-equivalent feed unit for major categories of production are: beef, 10.3; milk, 10.8; hogs, 11.0; poultry meat, 14.1; and eggs, 14.0 (8).

4/ The New Lands Program involved the seeding of about 40 million hectares of long-fallow or virgin lands in Kazakhstan and Siberia.

better than the relationship between yields and time. In every case, however, grain yield projections based on the fertilizer regression analysis were considerably higher than the linear extrapolations. Two time periods--1955-71 and 1960-71--were considered in the grain yield regressions. Extrapolation of the more recent, but shorter, historical series, which was used in the feed projections, generally resulted in higher yields. The results of the fertilizer analysis suggest that the extrapolation with the steeper uptrend is more realistic.

The alternative yield projections based on the fertilizer regression analysis assumed attainment by 1980 of the lower point of the planned range of 130 to 135 million tons (standard gross weight) of agricultural fertilizer use (17). This target compares with use of 46 million tons in 1970 and a planned 75 million tons in 1975. The largest increment of the fertilizer increase during the current 5-year plan, 1971-75, is slated for grain. Plans call for use of 32 million tons of fertilizer on grains in 1975, compared with 15 million tons in 1970 (15). Even if targets are not fully attained, a major jump in fertilizer use is expected and a further massive dosage should occur by 1980.

Other inputs also will play a role in improving grain yields, but their combined inpact probably will be less than the push from fertilizer. Liming of lands and drainage in the North European part of the country appears already to be positively influencing average yields in that area. The ambitious irrigation programs for the dry-land areas, however, are extremely long term, and probably will make only minor contributions during the next decade.

Shifts from lower to higher yielding grains are also expected to play an important role in raising grain production. The overall calculated grain yield projected to 1980 is 15 percent above a simple linear extrapolation of overall grain yields. The principal change expected is a shift from spring wheat to barley, but winter wheat probably will gain and winter rye decline. The direction of these changes has already been signaled by Soviet agricultural specialists (14). Price realignments on wheat and feed grains have been recommended to encourage these shifts (4).

Projected balances of Soviet domestic supplies of grain and wheat are compared in table 9 with the 1970 situation. All supply increases owing to imports would be added to feed use in the balances. Despite sharp cutbacks in spring wheat area, the balances indicate continuing substantial availabilities of wheat for feed use.

Soviet output of oilmeal from domestic production of oilseeds seems unlikely to increase faster than the long-term trend. In recent years, until 1973, production made little growth. Most gains since the mid-1960's have been in cottonseed. Sunflowerseed and linseed output have declined and soybeans have made little progress. In the projections, Soviet supplies of oilmeal from domestic sources were extrapolated on the basis of the 1955-71 trend, from about 4.0 million tons in 1970/71 to 4.9 million tons in 1980/81. Production of fishmeal, synthetic feed yeasts, and other high-protein concentrates has made steady progress, but these products still account for a very small share of the feed unit and digestible protein balances.

Table 9.--USSR: Grain and wheat balances, 1970/71, and projections for 1975/76, 1980/81, and 1985/86 1/

Year	Supply				Distribution						Stock Change
	Total	Production	Imports	Exports	Total	Dockage and waste	Seed	Manufacture	Food	Feed	
	Million metric tons										
Grain											
1970/71	179.6	186.8	1.3	8.4	183.3	18.7	24.8	2.8	45.3	91.7	-3.7
1975/76	209.6	214.6	--	5.0	209.6	21.5	25.9	2.8	45.0	114.4	--
1980/81	238.9	243.9	--	5.0	238.9	24.4	24.9	3.0	45.4	141.2	--
1985/86	267.9	272.9	--	5.0	267.9	27.3	24.0	3.1	45.3	168.2	--
Wheat											
1970/71	93.0	99.7	0.5	7.2	97.0	10.0	13.8	0.8	35.0	37.4	-4.0
1975/76	98.2	103.2	--	5.0	98.2	10.3	13.3	0.8	35.0	38.8	--
1980/81	105.9	110.9	--	5.0	105.9	11.1	12.2	0.8	35.4	46.4	--
1985/86	112.4	117.4	--	5.0	112.4	11.7	11.2	0.8	35.3	53.4	--

1/ Assuming zero imports.

The area and yields of hay, silages, and other forage crops generally were extrapolated from the 1955-71 trends. Despite a downward shift in the area trend as a result of 1973 structural changes, the long-term trend is upward. Substantial expansion, particularly of perennial grasses and clovers, is projected from the mid-1970's. Although yield uptrends are evident, little acceleration is apparent. The projections diverge greatly from Soviet plans on feed availabilities from roughages. The 1975 plan calls for an increase over 1970 of more than 100 million tons in feed units from roughages (3); the projections show only a 9-million-ton increase.

The divergence between Soviet plans on roughage production and the apparently more realistic projections is one of the central issues in future Soviet livestock production possibilities and trade requirements. Although the projected feed balances show a declining share of roughages in overall feed use, projected domestic availabilities would result in an even sharper decline and an absolute drop in feed energy available per livestock production unit. It seems likely that the USSR planners will of necessity turn increased attention in the next few years to improvement of forage areas, but accelerated yield growth is not yet evident.

THE FEED GAP

Any exercise that separately projects feed requirements and supplies is likely to result in a projected deficit or surplus. This exercise is no exception. To the extent that assumptions of linearity have been made in the projection methodology, the gap is likely to expand with the time horizon. This also is evident in these projections, as shown in table 10. The initial deficit, at least for concentrates, is relatively small, but the deficit increases substantially by 1980 and 1985.

Table 10--USSR: Balance of feed requirements and domestic supplies in oat-equivalent feed units, 1970/71 and projections for 1975/76, 1980/81, and 1985/86

Year	Total feed			Concentrates		
	Requirements	Domestic supplies	Balance	Requirements	Domestic supplies 1/	Balance
	Million metric tons					
1970/71	--	2/337	--	--	2/108	--
1975/76	399	374	-25	136	135	-1
1980/81	476	423	-53	187	165	-22
1985/86	575	473	-102	253	196	-57

1/ Assumes exports of 5 million tons of wheat.
2/ Assumes small quantities of imports.

A growing deficit can be expected to evoke a response. One response is to import feeds. Other responses are to increase supplies or reduce requirements. These other responses become more likely as the gap widens.

In my judgment, the initial response of Soviet policymakers to the feed deficit will be feed imports. This conclusion can be no more than a judgment, since the projections merely indicate the existence of a potential problem, not the solution of the problem. The quantities of imports will depend, of course, not only on the feed deficit, but also on foreign exchange and gold reserves, credit availabilities, foreign supplies and prices, specific trade relations, and overall foreign policies.

Beyond certain limits, which really cannot be identified because of the nature of the influencing variables, additional imports become untenable, and domestic policies must be altered to correct the imbalance. One of the first corrections, on the supply side, will probably be policies to sharply improve forage crop production in the USSR. Fundamental improvement of hay meadows and pastures, perhaps with a large share of fertilizer increases allocated to this work, is a likely course of action. Development of improved facilities for storage and use of silage is another good possibility.

Measures on the supply side probably will not be adequate to reduce the feed gap to bearable limits. Requirements, undoubtedly, will be lower than those projected. The most drastic method of reducing requirements is simply a cutback in livestock production plans and a reduction in consumption through price increases or shortages. Obviously, this is not a very popular policy course, and it can be expected that other means of reducing requirements will be attempted.

One of the soundest means of reducing requirements is to improve efficiency in production, through a better allocation of resources or through a technologically induced shift of the production function. The USSR in recent years has been actively improving its livestock breeding herd both through purchases of foreign breeding stock and through domestic breeding work. The mixed feed industry has been expanding rapidly. Plans call for establishment of a large network of large-scale modern livestock enterprises, including feedlots and vertically integrated poultry operations. These measures will only gradually improve the national average level of livestock efficiency, but they are underway.

The chronic underuse of protein in feeds is another potential course for improved efficiency in livestock production. As noted previously, the calculated deficit in 1970/71 was equal to the digestible protein in about 12 million tons of soybeans. The projected protein deficit by 1980 in domestically produced feeds is slightly larger. Although possibilities for major expansion of currently produced oilseeds appear limited, Soviet scientists are at work on a number of alternative sources of plant, animal, and synthetic origin. Still, barring a technological breakthrough, they are unlikely to close the protein gap during the next decade.

Improved protein ratios in feeds probably could greatly reduce the overall feed energy requirement. Some Soviet agriculturalists claim that output of livestock products could be increased by one-third without increasing energy intake if adequate protein were available (7). Although it is not possible to adequately evaluate this claim, the basic argument appears sound. Recognition of the importance of protein is not yet evident in Soviet foreign trade plans. It seems likely, however, that imports of oilseeds and oilmeals eventually will assume increased importance in Soviet feed trade.

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SOVIET AGRICULTURE AND WORLD TRADE IN FARM PRODUCTS 1/

By D. Gale Johnson

Over the past decade substantial concern has been expressed about the role of the Soviet Union in international trade in farm products. The nature of the concern has varied over time, however. At first the concern was that the Soviet Union would put significant downward pressure on world markets for certain farm products, especially wheat, barley, and oilseeds. It was believed that Soviet exports of such products might become large enough to adversely affect the export prospects of low-cost producers in North America and Australia. More recently the concern has been that the very large Soviet economy has been able to disrupt world markets for grains, not by large sales but by enormous purchases that were successfully camouflaged until the arrangements were nearly completed.

At this time it seems particularly appropriate to speculate about the role the Soviet Union will have in world trade in grains and feedstuffs. I want to emphasize that much of what follows is speculation since there is so much that we do not know about the decisionmaking process in the Soviet Union. We know little about stocks or reserves; we know hardly more about shifts in priorities that can have an enormous influence on international trade. And when we try to understand the implications of the decisionmaking process for international trade, we are confronted with many difficulties because trade--either exports or imports--represents a residual. Fairly small percentage changes in either consumption or production can lead to large relative changes in the net balance of trade. And since the aggregate quantity of world trade in grains has been about two-thirds of Soviet production of grain in recent years, year-to-year fluctuations in Soviet grain production are large relative to world grain exports in an average year.

It is finally becoming more widely recognized that the enormous grain imports by the Soviet Union in 1972/73 were due at least as much to a change in priorities--a change in objectives that affected decisions--as to a poor grain crop. Those of us who devote some attention to Soviet affairs perhaps were not quite as astute as we should have been in recognizing the shift in priorities. After all, or so Khrushchev claimed in his denunciation of Stalin, a poor grain crop in 1947 was followed by continued exports, and a famine occurred in some parts of the Soviet Union. In 1963 a poor grain crop resulted in significant grain imports to prevent human distress, though only half of the total decline in adjusted grain production was met by imports. Virtually everyone was

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1/ This paper is a revision and extension of testimony given before the Joint Economic Committee, Congress of the United States, July 18, 1973.

surprised when the response to the poor grain crop in 1972 was grain imports greater than the shortfall in production from 1971--a near bumper crop--to 1972. 2/ Neither the percentage nor the absolute reduction in grain production in 1972 compared with 1971 were as great as the reductions in 1963 compared with 1962, yet net grain imports were 2.5 times as great in 1972/73 as in 1963/64. 3/

In my presentation before the 1972 Agricultural Outlook Conference I attempted to rationalize or explain the substantial import commitments for feed grains entered into by the Soviet Union for 1971/72 following the good 1971 grain crop. At that time I apparently perceived rather dimly that there had been a shift in priorities. I commented that one of the reasons for the feed grain imports in 1971/72 of about 5 million tons was that the growth in demand for meat was "outstripping the amount that can be produced from domestic feed supplies. If ... (this) explanation is the most nearly correct, it implies that substantial feed grain imports may occur over the next several years. If recent grain crops have been record and near record, as claimed, it is highly probable that feed grain imports two or three times the amount purchased this year will be required in one or two years out of the next five to prevent the liquidation of livestock herds, especially hogs, such as followed the poor crops of 1963 and 1964." 4/ As my record at prognostications goes, that one turned out rather well. Yet, I can make no great claim of prescience since I was as surprised as anyone else that 1972/73 commitments to purchase were nearly 30 million tons rather than perhaps 15 million tons.

In this paper I shall comment on two aspects of Soviet trade in grain and feedstuffs. The first will be on the expected import volume over the next 4 or 5 years. The second will be a consideration of some of the problems that exist for the organization of world trade in grains and feedstuffs if the Soviet Union is either a continuous or a sporadic importer. Before turning to these two points I shall comment very briefly on the recent performance and prospects for Soviet agriculture.

SOVIET AGRICULTURE: PERFORMANCE AND PROSPECTS

It is appropriate to note the numerous weaknesses of Soviet agriculture: Costs of production are high; output is subject to major swings resulting from climatic variations; a very large fraction of the labor force is still required for agriculture and nonfarm production is adversely affected each year by the

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2/ In 1963/64 net Soviet grain imports were about 7 million tons; in 1972/73 net Soviet grain imports were about 17 million tons, though if all of the commitments could have been delivered the net imports might have been as high as 22 million tons.

3/ Official USSR grain production estimates (bunker weight) were as follows: (millions of metric tons): 1962, 128; 1963, 108; 1971, 181; and 1972, 168. The reduction in grain production from 1962 to 1963 was 16 percent; from 1971 to 1972, 9 percent.

4/ D. Gale Johnson, "Comparative Advantage and U.S. Exports and Imports of Farm Products," 50th National Agricultural Conference, February 23, 1972, p. 7.

necessity to ship millions of workers from the cities to the farms; and the share of agricultural investment to total investment is very high and is planned to increase to 27.5 percent of the total by 1975. In the United States, investment in agriculture accounted for approximately 5 percent of total private nonresidential investment in 1972. The average annual level of investment in agriculture during 1971-75 in the Soviet Union is planned to be $34 billion; this annual rate is almost four times the 1972 investment in U.S. agriculture of $8.7 billion. Yet, as estimated by Whitehouse and Havelka, net farm output in the United States was approximately a fifth larger than in the Soviet Union in 1966-71. 5/

In spite of these weaknesses the rate of increase for agricultural output compares very favorably with that achieved in other industrial countries. Diamond and Krueger estimated that farm output increased by 3.8 percent annually between 1951 and 1971. 6/ Even if we discount the favorable climatic conditions of 1971, we find an annual output growth rate of about 3.5 percent. Over roughly the same period, farm output increased by about 2.7 percent annually in the European Economic Community and 2 percent annually in the United States. Livestock output in the Soviet Union increased 4.5 percent annually over the same two decades. Thus while there are important weaknesses in Soviet agriculture, the positive aspects should not be ignored.

Yet there can be no doubt that agriculture is a major problem area for the Soviet economy. It is a high cost agriculture; it is an unstable agriculture. The instability could be managed by a rational policy of holding stocks, but apparently the pressure each year to reach or exceed plan objectives for output of livestock products results in continuous failure to plan adequately for the instability that exists. Given other similar decisions that are made, such as minimizing the area of summer or clean fallow which adds to instability of output and perhaps reduces longrun output, it may well be some time before this serious defect in economic organization will be repaired. The failure to invest in adequate drying facilities and suitable storage bins and elevators to protect bumper crops or crops adversely affected by high moisture content is a further indication of the failure of plan and investment decisions to cope with the instability of agriculture.

GRAIN AND FEED IMPORTS

It is my expectation that the Soviet Union will fairly soon return to its former position of being a small net exporter of wheat. Given the claimed record grain crop of 215 million tons (bunker weight) for 1973, the planned imports of 6 million tons of wheat for 1973/74 may be largely precautionary--to increase stocks at this time rather than depend on the availability of wheat to import later if needed. Given the composition of Soviet grain output, it seems

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5/ Soviet Economic Prospects for the Seventies, A Compendium of Papers submitted to the Joint Economic Committee, Congress of the United States, 93d Congress, 1st Session, Joint Economic Committee Print, June 27, 1973, p. 345.

6/ Soviet Economic Prospects for the Seventies, p. 317.

reasonable to expect that in most years the supply of wheat should be more than adequate to meet direct food needs, industrial uses, and seed.

However, there are grounds for believing that the Soviet Union will be a significant net importer of feed grains and oilmeals for a number of years. I shall try to indicate why I believe this to be probable.

In 1970 the grain crop was the highest on record; in 1971 the second largest crop was harvested. Yet in 1971/72 the USSR had net imports of approximately 4 million tons of feed grains. In these circumstances the importation of 4 million tons of feed grains takes on substantial significance. If it is true that in both 1970 and 1971 several million tons of wheat were used for livestock feed, the feed grain imports in 1971/72 take on added significance. In 2 years of record grain crops, current grain and feed output was too small to provide the feed for the desired livestock output.

Was there a shortfall in livestock production in 1970 and 1971 and was an effort being made to overcome it? In terms of the eighth and ninth 5-year plans, 1966-70 and 1971-75, the answer is, "no". In 1970, the last year of the eighth plan, meat, milk, and egg output exceeded the target for that year, and 1971 output of meat and eggs appeared to be equal to or perhaps slightly greater than the goal for the first year of the ninth plan. Milk output may have lagged in 1971, but here the major shortcoming was in the marketing system and not in production.

But it is fairly clear that the two recent plans have underestimated the growth in demand for livestock products, especially meat. The official prices of meat and milk in the State stores have not been increased since 1962. Thus prices have not acted to equate supply and demand in the State store system. The imbalance in the growth of demand and supply became evident as early as 1969 in the collective farm markets. Prices in these markets rose relative to State store prices in 1969 after several years of stability. The price ratios increased further for most livestock products in 1970 and appeared to stabilize in 1971; these ratios have undoubtedly increased in the past year.

The ninth plan assumes an increase in per capita meat consumption of approximately 21 percent. The planned growth in per capita income was 35 percent. By implication, the plan assumed that, for each 10 percent increase in income, meat consumption would increase by 6 percent. The income elasticity of 0.6 is almost certainly too low. A number of estimates of income elasticity of demand have been made by Soviet economists. Only one of the estimates that I have seen indicates an elasticity of less than 0.7 and others range up to 2.0. From what we know about meat consumption relationships in other countries, it is not unreasonable to assume that the income elasticity for meat is unity--a 10 percent increase in per capita income would result in a 10 percent increase in meat consumption, if the meat were available.

If the income elasticity for meat is unity, this means that per capita demand would increase by 35 percent by the end of the current plan. Even if the planned level of meat production were met, the supply increase would be much smaller than the demand increase. The discrepancy is so large that the alternatives facing the planners were all quite unpalatable. Meat prices could be increased--and substantially--but this was apparently ruled out, perhaps in part

because of the Polish riots. The excess demand could have been accepted, with ever-growing queues at the State stores and rising prices in the collective farm markets. The third alternative, and the one chosen, was to make a major effort to increase supply. While there were some meat imports, the major alternative chosen was to import feed grains in late 1971.

As of late 1971 it appeared that, if meat supply were to keep pace with the demand, perhaps 10 to 15 million tons of feed grains would need to be imported annually for the rest of the plan period if climatic conditions were normal or average.

The poor crop in 1972 obviously complicated life for Soviet planners. Even with the large grain imports, including about 5 million tons of feed grains, and some soybean imports, meat output in 1973 was planned at a level below that of 1972. Thus instead of keeping pace with the growth in demand, supply fell even further behind in 1973. If the 1973 grain crop had been at the planned level, substantial grain imports would have been required to move up to the 1974 planned level of meat production. If an effort were to be made to reduce the discrepancy between demand and supply at the official prices, feed grain imports of as much as 20 million tons would have been required in 1973/74. This is not a projection; it is an indication of the magnitude of the problem faced by Soviet officials.

Why does the Soviet Union find itself in the situation that with normal weather it is unable to provide the feed to meet its livestock goals? It is not that the goals, if put in terms of per capita consumption, are unreasonably high. The Soviet Union has nearly the lowest per capita level of meat consumption in Eastern Europe--and this would continue to be true in 1975 if its ninth plan goals are met. Its milk production per capita is low by comparison with Western Europe, but is at approximately the same level as the rest of Eastern Europe. A large fraction of its milk output is fed to livestock, however.

The most probable reasons for the shortfall in feed supplies are poor quality of most feeds, especially with respect to protein content; high feed-livestock conversion ratios, and inability to obtain reasonable yield levels for many feed crops. The high feed-livestock conversion ratios are in part due to the poor quality of feed, but also reflect management practices plus the failure of the industrial sector to provide farms with antibiotics, mineral supplements, and vitamins. The low level of protein production could be offset by imports of soybeans and similar products. If this route were taken, feed grain imports could be reduced by 2 to 3 tons for each ton of high-protein feed imported.

Inadequate performance of the livestock sector cannot now be blamed on low livestock prices. Livestock prices are high in comparison with those of all other countries. Even if one discounts the official exchange rate of the ruble by a major fraction, livestock prices are substantially higher than in Western Europe. The high livestock prices reflect both rather high consumer prices and the enormous subsidies paid for meat and milk to make up the difference between farm prices and the prices that can be realized by the processing sector. Such subsidies may now amount to as much as 13 to 15 billion rubles annually.

If the Soviet Union fails to improve the quality of its feed supply, to increase significantly its feed output, and to improve feeding efficiency, it will be forced to decide between two quite unsatisfactory choices: Large imports of feed, or a much slower growth of meat supply than of meat demand. If it accepts the latter, it must then decide between raising consumer prices or accepting a growing level of unsatisfied demand at existing prices.

I have spoken of grain and feed imports by the USSR in terms of possible courses of events over the next 3 or 4 years. There are so many uncertainties in the situation that it is impossible to look further ahead. There are many opportunities for increasing livestock output through more effective use of internal resources. While past experience indicates that progress in taking advantage of these opportunities has been slow, it should not be assumed that circumstances will not change. It may be that the enormous budget burden of meat and milk subsidies plus the added difficulties of large foreign exchange requirements may induce changes in organization and structure that were unimaginable in the past. I have no idea what the changes might be, but I do not believe that we can entirely rule out fairly dramatic changes. The costs of continuing to accept an increasingly untenable situation may eventually overcome ideology, even very strongly held ideology.

The large-scale imports of grains in 1972/73 were successful in preventing a significant slaughter of the livestock breeding herd such as occurred after the poor crops in the 1960's. As noted earlier, this difference in response to similar circumstances represented a significant change in priorities. Food imports were made not simply to maintain the supply of bread but to provide feed to save livestock and thus prevent the long, difficult, and expensive process of rebuilding the livestock herd.

SELLING GRAIN TO THE SOVIET UNION

The administrative structure responsible for grain imports into the Soviet Union fits the economist's definition of a monopsony buyer. A monopsony buyer has the power to influence the price that it pays for a product. When monopsony power is buttressed by secrecy, the potential price influence is enhanced. This is not the place to delve into the role of the wheat export subsidies in the large U.S. sales to the Soviet Union in the summer of 1972. It may be noted, however, that the enormously successful grain purchase operation, as viewed by the interests of the Soviet Union, rested primarily upon two considerations, namely that the Soviet Union was represented by only one buyer--an exceedingly competent buyer--and it was able to keep from all grain sellers the true extent of its need or the level of its probable purchases.

There is probably nothing that can be done to prevent the Soviet Union from having a single purchasing agency. Some might argue that the alternative would be for the United States to be represented by a single selling agency, but there are a variety of reasons to oppose this approach. While there is no conclusive evidence that having a single selling agency would be inadequate to solve the problem, it may be noted that countries so represented were no more effective in dealing with the Soviet buyer in 1972 than were the U.S. exporting firms.

What can be done is to work out some rules of the game that would maximize information about objective circumstances related to agricultural production in the Soviet Union and, to the extent possible, increase significantly the knowledge of intentions with respect to international trade in farm products. The agreement on cooperation in the field of agriculture entered into between the United States and the Soviet Union last June represents an important first step. I refer particularly to the agreement to exchange information, including forward estimates or forecasts, of production, consumption, demand, and trade of the major agricultural commodities. The agreement did not cover the exchange of information on stocks or reserves of farm products. While such information would be highly useful, it is perhaps understandable that it is not likely to be forthcoming in the near future.

The actual or potential erratic fluctuations in year-to-year Soviet grain trade does represent an important difficulty for the other nations that engage in substantial international trade in agricultural commodities, either as exporters or importers. The impact of the large Soviet grain imports in 1972/73 on prices over the past year almost certainly exaggerates the negative implications. Not all of the presumed undesirable impact on prices that followed the enormous Soviet grain imports of 1972/73 should be blamed on the Soviet Union. If the major exporters had not been so anxious to export enormous quantities, the Soviet Union could not have pulled off such a major coup and obtained commitments for such an unprecedented amount of grain at such low prices.

If the Soviet Union is to be a major importer of grains for a number of years, it is likely that it would be in the interests of both the Soviet Union and the major grain exporters to agree not only to share information to the fullest extent possible, but perhaps to work out arrangements that would assure the Soviet Union that it could meet its import needs at reasonable prices but within a framework that would minimize the possibility of major surprises. One highly improbable possibility would be for the Soviet Union, after it has had access to full information on supplies available in the major exporting nations, to announce that it wished to receive bids for the delivery of specified amounts of grain and feedstuffs, retaining the right to vary the amount actually purchased within a specified range. There is enough competition among the potential exporters to avoid any price exploitation of the Soviet Union, but this procedure would eliminate any advantage that the Soviet Union has as a monopsonist.

A more probable procedure might be for the Soviet Union to provide a forward estimate of its anticipated imports of the major grains, including any quantities that may have already been contracted for. This would only be an estimate, not a commitment, and might be adjusted as further information on crop output becomes available during the year. It appears that it would be in the interest of the Soviet Union to make these estimates as accurate as possible since I suspect a Soviet credibility gap now exists in the international grain markets. A seller that the Soviet officials now approach must surely be on guard, perhaps unnecessarily so, that he is involving himself in the same game played in 1972/73. It is interesting that during 1973/74 Soviet officials have gone to some pains to inform officials of the U.S. Department of Agriculture that they had no intentions of increasing their import commitments in excess of a certain level and indicated when that level of commitments had been reached.

To some considerable extent, the possibility of working out arrangements that will permit the international grain and feedstuffs markets to accommodate the Soviet Union as a major importer depends upon the behavior of the major exporters. If the exporters once again enter into a race to dispose of their stocks as rapidly as possible, we can be assured that if the opportunity presents itself the Soviet Union will take advantage of the situation. And there is no reason why it should not do so.

CONCLUSION

It is a reasonable expectation, in my opinion, that the Soviet Union will be a net importer of feed grains and other feedstuffs for the next several years. The level of imports will fluctuate with crop output, but in most years imports will be required if the expansion of livestock output will keep up with the growth of demand. How long the Soviet Union is likely to need feed imports is highly uncertain. There are substantial potentials for improving the output of feed and the effectiveness of transforming feed into livestock output. I doubt if anyone knows, including Soviet officials and planners, whether and when some of these potentials might be realized.

Significant problems emerge when a monopsony buyer enters a market. It appears to be in the interests of both the Soviet Union and the major exporters to minimize some of the problems that arose in 1972/73 and might arise again in the future.