# I. Reform Shocks to the Livestock Sector

*The transition from central planning to a free market brought severe shocks to the livestock sectors of the transition economies. Demand-side shocks included rising consumer prices and falling real income that came with price and trade liberalization. On the supply side, producers faced falling output prices and sharply rising prices for feed and other inputs. Producers also had to adapt to fundamental changes in the markets for land, labor, and capital that came about with the transition.*

A major restructuring and downsizing of production and consumption were accompanied by changes in the volume and patterns of trade. Since reform began, with a few notable exceptions, both livestock inventories and production in Poland, Hungary, Romania, Russia, and Ukraine have dropped by about half (tables I-1 and I-2). Though the countries in question did not have uniform agricultural systems, the main reform-induced shocks to the livestock sector have been similar, affecting both the demand and supply sides of the market.

## Demand-Side Shocks

The main shock on the demand side is the reduction in consumer income and purchasing power brought on by economic reform. First, reform increased both unemployment and underemployment. At the start of 1999, unemployment in all five countries in question was above 10 percent (in 1990, unemployment figures varied between 0.4 percent in Romania and 6.3 percent in Poland). Also, many workers had become substantially underemployed, in that their jobs require them to work only a small fraction of any given week, with a corresponding drop in pay.

Consumer income also dropped because price liberalization, the lead policy of economic reform, caused prices to rise more than wages and salaries, thereby decreasing consumers' real income and lowering their purchasing power. In the pre-reform period, consumption of most foodstuffs, livestock products in particular but many other consumer goods as well, was heavily subsidized, with consumer prices often far below the real cost of production. Price liberalization eliminated most of these consumer subsidies, causing a jump in consumer prices to reflect full production costs. Within 4-5 years after the beginning of economic reform, per capita real income had decreased significantly in all five countries: from 20-25 percent in Poland and Hungary to about 40 percent in Russia.

Demand for meat and other livestock goods is fairly sensitive to changes in income (income elastic), while demand for staple products, such as bread and potatoes, is not. Since 1990, per capita consumption of livestock products has dropped significantly, with the sharpest declines, about 40 percent, in Russia and Ukraine.

Among the meats, consumption of poultry initially fell much less than that of beef and pork, and then leveled off or even increased (in Poland and Hungary). The principal reason is that poultry became cheaper than the other meats. In Poland and Hungary, poultry meat was cheaper than red meat at the beginning of the transition. In Russia, producer and consumer subsidies were higher for beef and pork than for poultry at the beginning of the transition, so that prices for beef and pork rose more after the removal of the subsidies. Poultry prices also remained low as a result of large imports of inexpensive frozen poultry legs. In 1990, the consumer price of a kilogram of poultry in Russia was 40 percent higher than for beef and pork. By 1997, a kilogram of poultry cost consumers 26 percent less than a kilogram of pork, and about the same as a kilogram of beef.

## Supply-Side Shocks: Changing Terms of Trade

The main supply-side shocks have been changes in relatives prices faced by producers—output prices compared with input prices, as well as relative prices between inputs. The two policies most responsible for these relative price changes have been price liberalization and integration into the world economy.

Price liberalization, which was accompanied by policies eliminating or reducing subsidies to producers, worsened producers' terms of trade—that is, the prices producers had to pay for inputs rose by a greater percentage than the prices they received for their output. For example, from 1991 to 1996, farmgate prices for all meats in Russia rose by only about 25 percent as much as prices for mixed feed. The shock of deteriorating terms of trade for livestock producers has been a major reason for the sector's output decline (Macours and Swinnen, 1997, see table I-3).

The second supply-side shock for the livestock sector was the transition economies' integration into the world economy. Although the degree of integration varies by country and by livestock commodity, in general these economies have become sufficiently integrated and free-trading that domestic output must compete with imports, and world prices largely determine domestic prices. For all five countries in question and for most livestock commodities, integration and the growth of trade has resulted in an increase in imports and a decline in exports. The rapid surge of imports suggests that, before trade was opened up, the real costs of production were above world prices.

By the mid-1990s, Poland and Hungary had managed to reverse the flow of imports. During 1992 and 1993, both became large net importers of all meats. However, both are now net exporters of pork, and Hungary is a net exporter of beef and poultry as well. Russia, however, continued to be a major importer of meat, with imports supplying more than half of all domestic consumption of poultry (mainly from the United States) and 20-25 percent of beef and pork (mainly from the EU). These imports dropped substantially after the ruble devaluation of August 1998, but Russia remains a net meat importer.

**Table I-1—Livestock inventories during the transition**

| | 1987-89 average | 1991-93 average | 1994-96 average | 2000 | 1991-93 | 1994-96 average | 2000 average |
|---|---|---|---|---|---|---|---|
| | *1,000 head* | | | | *Percent decline from 1987-89 average* | | |
| **Russia** | | | | | | | |
| Cattle | 59,867 | 54,649 | 43,968 | 27,516 | -9 | -27 | -54 |
| Cows | 21,033 | 20,455 | 18,554 | 12,933 | -3 | -12 | -39 |
| Hogs | 39,733 | 35,073 | 25,349 | 18.270 | -12 | -36 | -54 |
| Sheep, goats | 63,267 | 54,939 | 35,417 | 18,270 | -13 | -44 | -78 |
| Poultry | 638,667 | 626,733 | 492,867 | 356,000 | -2 | -23 | -44 |
| **Ukraine** | | | | | | | |
| Cattle | 26,105 | 23,603 | 19,596 | 10,641 | -10 | -25 | -59 |
| Cows | 8,628 | 8,233 | 7,809 | 5,428 | -5 | -9 | -37 |
| Hogs | 19,641 | 17,814 | 14,129 | 10,042 | -9 | -28 | -49 |
| Sheep, goats | 9,308 | 7,828 | 5,513 | 1,914 | -16 | -41 | -79 |
| Poultry | 251,100 | 234,600 | 168,367 | 125,900 | -7 | -33 | -50 |
| **Hungary** | | | | | | | |
| Cattle | 1,693 | 1,383 | 946 | 857 | -18 | -44 | -49 |
| Cows | 612 | 532 | 429 | 399 | -13 | -30 | -37 |
| Hogs | 8,410 | 6,452 | 4,796 | 5,335 | -23 | -43 | -37 |
| Poultry | 64,666 | 42,871 | 36,106 | 29,385 | -34 | -44 | -55 |
| **Poland** | | | | | | | |
| Cattle | 10,348 | 8,216 | 7,194 | 6,039 | -21 | -30 | -41 |
| Cows | 4,884 | 4,393 | 3,682 | 3,296 | -10 | -25 | -33 |
| Hogs | 19,532 | 20,508 | 18,968 | 18,224 | 5 | -3 | -7 |
| Poultry | 62,841 | 58,477 | 52,896 | 54,250 | -7 | -16 | -14 |
| **Romania** | | | | | | | |
| Cattle | 6,941 | 4,473 | 3,553 | 3,060 | -36 | -49 | -56 |
| Cows | 2,244 | 1,405 | 1,085 | 930 | -37 | -52 | -59 |
| Hogs | 14,762 | 10,936 | 8,316 | 6,650 | -26 | -44 | -55 |
| Poultry | 126,729 | 105,045 | 78,511 | 69,143 | -17 | -38 | -45 |

Sources: USDA; Statistical Yearbooks, U.N. Food and Agriculture Organization.

**Table I-2—Livestock output during the transition**

| | 1987-89 average | 1991-93 average | 1994-96 average | 2000 | 1991-93 average | 1994-96 average | 2000 |
|---|---|---|---|---|---|---|---|
| | *1,000 head* | | | | *Percent change from 1987-89 average* | | |
| **Russia** | | | | | | | |
| Beef | 4,132 | 3,660 | 2,868 | 2,126 | -11 | -31 | -49 |
| Pork | 3,387 | 2,802 | 1,891 | 1,250 | -17 | -44 | -63 |
| Poultry meat | 1,773 | 1,485 | 872 | 705 | -16 | -51 | -60 |
| Milk | 54,385 | 48,549 | 39,079 | 31,855 | -11 | -28 | -41 |
| Eggs | 48,538 | 43,358 | 34,393 | 34,150 | -11 | -29 | -30 |
| **Ukraine** | | | | | | | |
| Beef | 2,004 | 1,638 | 1,220 | 803 | -18 | -39 | -60 |
| Pork | 1,547 | 1,205 | 837 | 675 | -22 | -46 | -56 |
| Poultry meat | 703 | 505 | 239 | 200 | -28 | -66 | -72 |
| Milk | 24,077 | 19,966 | 17,101 | 12,562 | -17 | -29 | -48 |
| Eggs | 17,497 | 13,492 | 9,434 | 8,818 | -23 | -46 | -50 |
| **Hungary** | | | | | | | |
| Beef | 118 | 114 | 68 | 57 | -3 | -42 | -52 |
| Pork | 1,043 | 667 | 461 | 463 | -36 | -56 | -56 |
| Poultry meat | 452 | 316 | 351 | 370 | -30 | -22 | -18 |
| Milk | 2,924 | 2,336 | 1,998 | 2,125 | -20 | -32 | -27 |
| Eggs | 4,514 | 4,315 | 3,542 | 3,236 | -4 | -22 | -28 |
| **Poland** | | | | | | | |
| Beef | 782 | 622 | 400 | 330 | -20 | -49 | -58 |
| Pork | 1,820 | 1,852 | 1,541 | 1,610 | 2 | -15 | -12 |
| Poultry meat | 347 | 319 | 374 | 580 | -8 | 8 | 67 |
| Milk | 15,763 | 13,405 | 11,644 | 12,530 | -15 | -26 | -21 |
| Eggs | 8,129 | 6,083 | 6,400 | 7,600 | -25 | -21 | -7 |
| **Romania** | | | | | | | |
| Beef | 227 | 272 | 163 | 173 | 20 | -28 | -24 |
| Pork | 780 | 505 | 470 | 280 | -35 | -40 | -64 |
| Poultry meat | 387 | 210 | 158 | 63 | -46 | -59 | -84 |
| Milk | 4,242 | 4,441 | 5,529 | 5,535 | 5 | 30 | 30 |
| Eggs | 7,750 | 6,037 | 4,050 | 4,500 | -22 | -48 | -42 |

Sources: USDA and country statistical yearbooks.

**Table I-3—Input and output price changes for the Russian livestock sector**

| | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 |
|---|---|---|---|---|---|---|---|
| | | | | *Percent change* | | | |
| Input prices | | | | | | | |
| All ag. inputs | 93 | 1523 | 969 | 321 | 222 | 64 | 18 |
| Mixed feed | 113 | 1690 | 760 | 271 | 160 | 104 | 7 |
| Output prices | | | | | | | |
| All farm products | 63 | 845 | 712 | 204 | 235 | 44 | 9 |
| Livestock products | 60 | 520 | 940 | 220 | 260 | 34 | 18 |
| All meats[1] | 55 | 460 | 1163 | 186 | 219 | 37 | 24 |
| Cattle | 48 | 380 | 1069 | 164 | 238 | 34 | 21 |
| Hogs | 51 | 624 | 1245 | 201 | 225 | 34 | 28 |
| Poultry | 69 | 718 | 1342 | 210 | 192 | 42 | 26 |
| Milk | 36 | 594 | 756 | 234 | 366 | 24 | 18 |
| Eggs | 16 | 735 | 973 | 316 | 202 | 47 | 9 |

[1]Without subsidies.
Sources: Sel'skoe khoz. Rossii; Tseny v Rossii, 1995; Ministry of Agriculture, Russia; Goskomstat Rossii.

## Intensifying Factors: A Look at Capital, Land, and Labor

Underdeveloped or nonexistent capital, land, and labor markets continue to exacerbate the reform-induced shocks experienced in the livestock sector. Capital markets were so removed from the needs and functioning of a socialist centrally planned economy that the move to a market-driven economy has required that the very concept of capital markets be developed from scratch. These markets remain nearly nonexistent. Land and labor, two key inputs, have very low relative prices, especially compared with material inputs and capital. Whereas these low prices themselves do not constitute harmful shocks to the livestock sector, they do reflect the dramatic rise in the relative prices of material inputs and capital, and, in many cases, the low quality of much of the agricultural land and labor inherited from the pre-reform period.

**Capital Markets.** The notion of capital markets, in which commercial entities function as financial intermediaries between savers and investors, had no place in the functioning of a Socialist centrally planned economy. In fact, a defining feature of socialism is that capital is not a morally legitimate commercial input deserving of a return, since only labor—either current labor or past labor embodied in physical inputs—can add value to output. This is one of the reasons why capital markets, especially in more isolated and less reform-influenced rural areas, have been so underdeveloped.

In the pre-reform period, state-owned production enterprises (not only in agriculture but economy-wide) received most of their inputs, including capital investment, directly from state allocations. Even today, in many regions, rural capital markets either do not exist, or the amount of funds available for lending is so small that the cost of borrowed capital is very high. The relentless downsizing of agriculture, and of the livestock sector in particular, aggravates the problem, as it advertises agriculture as an unpromising sector to lend to. Hence, reform has resulted in a drastic decline of capital investment in agriculture.

**Land.** In the view of pre-reform central planners, land, like capital, did not contribute to the value of output. It therefore was not priced and was not included in the cost-based valuation of output. To the extent that economic reform in the transition economies has created markets and prices for land, land is relatively inexpensive, a result that makes sense from the point of view of relative factor endowments. During the Socialist period, planners felt that land should be used in production to the maximum. Agriculture was therefore pushed onto marginal land, some of which would probably not be farmed in a profit-driven market system. The generally low current price of land in transition economies also reflects, to some degree, the low quality of much of the land.

The land reform process in transition economies has also resulted in land and plot holders' being given either land or the right to continue working on currently held land (see Box I-1). Even during the Socialist period, households in Poland owned and worked their land. In Hungary and Romania, the land restitution process provided virtually free land to millions of households. In Russia and Ukraine, households on the former state and collective farms continue to independently farm small subsidiary plots. In all of these countries, farming households pay no taxes on the land they work.

Although land is inexpensive, acquiring additional land is extremely difficult. Underdeveloped or nonexistent land markets in most countries make the commercial acquisition of land almost impossible. The result is that large numbers of animals are kept on very small plots of land. Only cattle are directly affected by the small size of land holding, since they need land for grazing. But the small size of plots has had a strong impact on the way feed crops are grown, so pigs and poultry have also been affected, although indirectly. Well-functioning land markets are therefore another institutional market requirement for the development of a prosperous livestock industry in the transition countries, and this issue will be taken up in more detail in later chapters.

**Labor.** In terms of labor, during the Socialist period, sufficient mobility existed among industrial and urban workers such that Western specialists on these economies believed that fairly well-functioning markets existed for such labor, generating prices for labor that reflected the value workers added to production (see Bergson, 1961, and CIA, 1962). However, in Russia, Ukraine, and Romania, markets did not exist for agricultural labor, and state planners did not move labor among farms. Private farmers did not exist, and workers on state and collective farms were in essence deprived of the right to leave their farms. In Poland and Hungary, there was some movement of labor out of agriculture before 1989, but options for agricultural workers were severely limited. The most serious obstacles were housing shortages in urban areas and requirements for official permits to transfer to the larger cities.

Although agricultural labor markets did not exist during the socialist period, farmworkers did receive money wages. The price of farm labor as reflected by these wages shows that the labor was fairly inexpensive. Wages for agricultural workers were below those of industrial workers (though the gap narrowed a bit in the 1970s and 1980s). Another indicator is that the share of agricultural workers in the total labor force in these countries was greater than the sector's share in GDP. One reason for the low price or value of labor is its low quality. State and collective farms provided all the social-welfare needs of their workers, and the labor force was tilted toward both the unskilled and elderly. Some of the farmworkers counted in official state statistics on the agricultural labor force should probably not have been included, since they contributed little to production.

Low wages in the cities for low skilled labor, shortages, and state control of housing provide disincentives to move. Proximity to the land and food supplies is an incentive to stay. Consequently, there is a large rural labor force that is under-employed.

The relatively low cost of agricultural labor has been carried over into the reform period. Given the reform-induced growth of urban unemployment, many workers value the greater relative security of life and work on the farm. Although agriculture can play a strong role in the

### Box I-1—Land Reform in the Transition Economies

In all five countries under consideration, the transition has meant the widespread redistribution of land and a redefinition of property rights. The process had proceeded at a different pace in the different countries, and each has chosen a different way to distribute land. Many of the countries opted for restitution of land to former owners or their heirs based on historic boundaries. Laws in Russia and Ukraine called for the distribution of land among collective workers and pensioners in more or less equal shares. Restitution was not an alternative in the Newly Independent States, since the farmers never owned land. The table below summarizes land reform undertaken since transition began in the study countries.

In Romania and Hungary, private landownership was legalized shortly after the demise of Communism. In 1991, Romania passed a land reform law restoring land to the pre-Communist owners. However, even now, many new owners lack permanent title, and land sales remained severely restricted until 1998. In Hungary, land was restored to former owners by means of a voucher system. Land sales there are legal and there is an active land rental market. Land may not be owned by foreigners or corporations, but only by individuals. In Poland, collectivization was never as complete as in other countries. Many small farms remained in private hands.

In Russia and Ukraine, while about 60 percent of the land is officially in private hands, the percentage actually farmed by households is much smaller than in the other three countries (see table). Most of the land that is individually farmed in Russia and Ukraine is in household or garden plots. Remaining private land is usually leased back to the newly privatized cooperative or collective farm.

While all five countries have seen the emergence of a small number of large private farms, it remains true that most private farms tend to be small and are often little more than household plots. The number of people on the land far exceeds the numbers in Western countries. For example, the Polish government estimates that employment on private farms is about 36 workers per hectare, and in parts of Poland this number rises to more than 100 persons per hectare. In contrast, the EU average is about 5.6 persons per hectare. In 1997, the Romanian government estimated the average sized private farm was about 3 hectares, and furthermore estimated that 7 to 10 hectares was needed to be competitive.

**Land Privatization in the CEEC and the NIS**

| Country | Restitution of historic boundaries | Private ownership | Use rights transferable | Percentage of land cultivated by private households in 1996 |
|---|---|---|---|---|
| Poland | No, land already in private hands before 1990. | Yes | Yes | 82 |
| Hungary | No, vouchers | | | 54 |
| Romania | Yes | Yes | Yes | 67 |
| Russia | No | Yes* | Yes* | 11 |
| Ukraine | No | Yes* | Yes* | 17 |

* Legally, land is privately owned and transferable in Russia and Ukraine, but in actual practice most individuals find it difficult to exercise these rights.
Source: OECD, 1999

social safety net, the continued large relative size of the agricultural labor force in these countries and low wages for farmworkers keeps farm incomes low. Farm incomes will grow only if labor productivity increases, which requires two developments. One is effective reform within agriculture that motivates the changes necessary to raise productivity: these changes are not technological only, but extend to the entire system of production (management, organization, and worker incentives). The other is economy-wide reform that increases real wages and employment opportunities outside of agriculture, so that surplus labor created by productivity growth within agriculture can find sufficiently attractive employment opportunities elsewhere to leave the farm.