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Support to Romania Agricultural Sector Grant Program

Final Project Report

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by

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Abbreviations and Acronyms

ASA	American Soybean Association
CIGA	Commodity Import Grant Agreement
CL	Coopers and Lybrand (Auditors)
EU	European Union
EC-PHARE	European Community (Poland, Hungary, Albania, Romania, Estonia)
GDP	gross domestic product
GOR	Government of Romania
g	gram
IFDC	International Fertilizer Development Center
judet	district (41 districts in Romania)
kg	kilogram (1,000 grams or approximately 2.2 pounds)
km ²	square kilometer
lei	Romanian monetary unit
MAA	Ministry of Agriculture and Food
MOF	Ministry of Finance
MAPPM	Ministry of Water, Forestry, and Environmental Protection
mm	millimeter
mt	metric ton (1,000 kilograms or approximately 2,200 pounds)
Nutricomb	State animal feed manufacturer
OSU	Ohio State University
Romcereal	Romanian state cereal authority
ROMCONTROL	Romanian port authority
U.S.	United States of America
USAID	United States Agency for International Development

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About 25 Romanian IFDC staff members who served the project as monitors, data analysts, secretaries, drivers, interpreters, specialists, and guards, worked with a strong commitment to benefit the country and contributed daily to the successful implementation of the program.

**Chronology of Significant Events During the
Commodity Import and Technical Assistance Programs**

August-December	1992	Assessment of project logistics and initial mission completed with USAID funding.
January	1993	IFDC resident consultant begins field work.
April	1993	Technical assistance grant agreement signed retroactive to February 1, 1993
May	1993	Publicity campaign begins for the first series of auctions using radio, television, newspapers, and posters.
May	1993	9 pre-auction seminars completed.
June	1993	First shipment of 10,220 mt (net) swine feed supplement arrives in Constanta, Romania, from the United States.
June	1993	10,220 mt of swine feed supplement sold to private farmers through 8 auctions.
July	1993	Publicity campaign for the second series of auctions begins.
July	1993	Monitoring of the performance of the feed supplement begins.
July	1993	An assessment of animal waste management and environmental issues in swine and poultry production begins.
August-September	1993	4 pre-auction seminars for the second shipment of swine and poultry supplement completed.
September	1993	Monitoring data show excellent performance of the swine feed supplement with decreased mortality, decreased weaning period, increased lactation, improved weight gain, and decreased time to market.
September-October	1993	4 auctions completed selling 6,470 mt of swine and poultry feed supplement to private farmers.
October	1993	Second shipment of 6,470 mt (net) of swine and poultry feed supplement arrives in Romania.
February	1994	The formation of an association of private animal growers in Romania (ARCA) begins.
March	1994	The Romanian Ministry of Agriculture and Food approves the registration of ARCA.

April	1994	IFDC is approved legally to work in Romania as a non-profit organization.
April	1994	ARCA is registered and approved by the Government of Romania as a legal entity.
April	1994	An assessment of animal waste management and environmental issues about swine and poultry production in Romania is completed.
April	1994	Final IFDC accounting firm report submitted to USAID on the local currency fund deposited in Banca Agricola as of March 31, 1994.
May	1994	ARCA sponsors 3 symposia for private farmers on agro-technology.
June	1994	Certificates of achievement and appreciation are awarded to the private farmers who participated in the feed supplement monitoring program.
June	1994	Paid membership in ARCA reaches 100 and a newsletter for private animal producers is developed and distributed.
July	1994	Seminars on market development for private animal producers are conducted.
August-September	1994	Farmers' fairs and agricultural expositions are conducted to introduce the concept of private markets and promote ARCA.
September	1994	The 4th edition of the ARCA newsletter is distributed to private animal producers.
October	1994	Workshop on animal manure management is completed.
October-November	1994	A training program on the application of crop simulation models in Romania is completed.
November	1994	Study tour to identify the constraints to agri-inputs markets and to develop a plan for privatization is completed by a team of IFDC specialists.
November-December	1994	A final report on the commodity import program is drafted and the project is completed.
January-February	1995	An additional grant/contract is in the process of being awarded to IFDC to supervise and monitor the use of local currency (generated from the sale of the feed supplement) to accelerate the cadastral survey. An IFDC staff member is posted to Bucharest to supervise the work.

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Executive Summary

Final Project Report

Support to Romania Agricultural Sector Grant Program

Introduction

With the financial support of two Grants¹ from the United States Agency for International Development (USAID), IFDC, over a period of 23 months from February 1, 1993, to December 31, 1994, performed the following work as outlined in the Terms of Reference (TOR) of the respective grant documents. In preparation for the work covered by the above two Grants, IFDC performed a pre-project assessment and developed a project design with funding provided by USAID. This activity occurred during the period August-December 1992.

Terms of Reference (TOR)

1. The primary task of IFDC in this project was to provide emergency relief to the Romanian private sector swine and poultry producers through the importation of approximately 17,000 mt protein-based animal feed supplement. An additional task was to assist the Romanian Government in the privatization of the animal production sector by providing private producers access to improved quality feed. The TOR required IFDC to:
 - a. Verify acceptability by the Romanian farmer of a universal supplement specification that will significantly decrease the time required for the development of swine from birth to market size (100 kg)
 - b. Issue the invitations for bids to acquire the feed supplement in the United States and select the successful bidder in accordance with USAID Commodity

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Importation Regulations while working closely with the USAID Office of Procurement.

- c. Arrange to ship the feed supplement to Romania and coordinate the unloading and dispatch at the Port of Constanta.
 - d. Coordinate the logistics for farmers' transport so as to deliver the material to successful bidders (described in paragraph 2) at the port or arrange for temporary storage in the port.
 - e. Provide technical advice to Romanian farmers on the recommended use of the supplement and monitor the results.
2. Promote the development of a free market economy in the Romanian animal production sector as it changes from state ownership to private ownership. The transition will be supported in part through the experience of public auctions and an example of competition in the allocation of animal feed supplement. In this work, IFDC was expected to:
- a. Develop and implement a screening process to ensure that the emergency commodity importation program benefits private sector farmers and excludes state-owned farms and enterprises.
 - b. Design, organize, and conduct a series of public auctions using sealed bid tenders to allocate the imported feed supplement among the buyers and to provide information regarding the process of price discovery (determination of the market price for feed supplement).
 - c. Ensure that full payment by each of the winning bidders in each auction is deposited in an interest-bearing Separate Account established by the GOR at the Banca Agricola (Account No. 64260160) for purposes of USAID Program No. 180-0048 (cadastral survey).
 - d. Design and implement a media campaign to promote the idea of a free market economy and publicize the auctions and pre-auction training seminars.
 - e. Develop and conduct a series of technical training seminars to teach Romanian animal producers about the proper use of feed supplement.
 - f. Develop and implement a technical monitoring program to assess and document the benefits of using the feed supplement.

- g. Develop and implement a system to monitor the product from the arrival at the port to the end user, and to the extent possible, help to ensure that the product is not exported from Romania or "leaked" into the state-owned farm sector.
 - h. Develop and implement a documentation and analytical procedure for evaluating the price discovery experience including the self-selection process of determining bidders, the evolution of bidding strategy throughout the bidding process, the personal and business profile of successful bidders, the relationship between existing market and bid prices, and other objectives that will assist in evaluating the procedure and design of a future strategy.
3. Develop a marketing plan for feed supplements and other agricultural inputs. The task of IFDC in this area was to assist the GOR in enhancing agricultural sector development in the provision of feed supplement and related agricultural inputs through improvements in domestic production, importation, and marketing through the implementation of open market policies that incorporate private-sector participation and resources. Under this activity, IFDC was expected to:
- a. Assess, design, and promote responsive and cost effective agri-input supply and distribution systems with interventions that focus on private open-market economics that assure competition.
 - b. Provide advisory services to the GOR and the private sector through the recommendation of policies that will promote the development of an open-market economy.
 - c. Provide the services of qualified expert advisors in the private marketing of agri-inputs.
 - d. Develop recommendations and plans for the privatization of the state-owned feed supply structure and provide assistance in the development of a plan for the development of privately operated farm service centers.
 - e. Assist private companies that would have interest in testing the Romanian market for importation of feed supplement by providing technical assistance for commercial import and auction of imported product.
4. Assess the systems for the management of environmental wastes (particularly manure and liquid waste) from animal production and develop recommendations to the GOR

for improvement. This activity required an assessment of existing environmental management of wastes from large swine and poultry operations. In support of this activity, IFDC will:

- a. Perform a preliminary assessment of the present magnitude of the animal waste management problem and define the practices that are used currently by the industry.
 - b. Develop an animal waste management plan and recommendations that will eventually allow the Romanian animal production sector to adhere to the standards of the European Union (EU).
 - c. Advise the GOR on the implementation of the plan recommended for animal waste management.
5. Assist the Directorate of the Cadastre in the Ministry of Agriculture and Food in the cadastral survey to accelerate the distribution of land to private owners. IFDC was expected to:
- a. Provide advice on policy issues in using the funds, including issues of privatization of the cadastre work, fiscal reform, and taxation for fiscal years 1993 and 1994.
 - b. Clarify and describe the procedures and processes of budgeting, accounting, procurement, inventory control, monitoring, and auditing within the Ministry of Agriculture and Food for materials to be procured in support of the cadastral survey to make all procedures acceptable to USAID for the control of local currency generated from the Grant.
 - c. Develop a reporting and evaluation procedure for the Directorate of the Cadastral Survey for keeping USAID fully informed about the progress of the cadastral survey.

Summary of Grant Program Activities and Performance

To meet the objectives of the above TOR, the following major activities and issues were performed/addressed by IFDC:

- Organization of pre-auction seminars and auctions, including importation and dispatch of approximately 17,000 mt of feed supplement.
- Price discovery (determination of the market price for feed supplement).
- Performance of the swine and poultry supplement.
- Recommendations for animal waste management.
- Policy issues relative to the supply and use of farm inputs.
- Support program recommendation designed to stimulate economic development of small private farmers.
- Recommendations for cadastral precincts.
- Problems encountered and lessons learned.

A discussion of the highlights of the above activities/issues follows.

Organization of Pre-Auction Seminars and Auctions

The emerging private farm sector was selected as the primary beneficiary of the feed supplement program. Therefore the pre-auction seminars and the feed supplement auction program were designed for their exclusive participation. This was done to ensure that the feed supplement did not find its way into the state-controlled animal feed and swine/poultry production subsectors, which at the time dominated the scene.

Media Publicity – As required by the TOR, a media campaign was organized to inform the Romanian public about pre-auction seminars and the feed supplement auctions per se. The effort was broad and included announcements through posters, newspapers, radio, television, and letters to various organizations. Quite naturally, announcements through these media led to people learning about the effort through friends, banking officials, and the MAA. The most frequently cited sources of information were television (53%), followed by MAA (35%), radio (27%), posters (26%), newspapers (26%), IFDC letters (10%), friends (7%), banks (7%), and other (1%). Many respondents cited more than one source of information about the auctions.

Pre-Auction Seminars – Seminar presentations explained the auction program and the procedures to purchase the feed supplement. The sales required sealed bids and participants could offer multiple bids. The feed supplement was offered in 10-mt lots with a maximum

purchase of 50 lots (500 mt) by a single purchaser and the minimum purchase was 1 lot (10 mt). Funds from successful bidders were transferred using bank letters of guarantee. Auction participants were allowed to bid only in the amount shown in the bank guarantee. Farmers who intended to purchase 1 lot were not required to have a bank letter of guarantee but were required to deposit the amount bid into the special account within 14 days of the date of the auction. Most of the transfers were completed within 7 days from the date of transfer. In the second pre-auction seminar the participants were informed that the minimum purchase was decreased to 5 mt and the maximum purchase was decreased to 300 mt.

Participation in the Pre-Auction Seminars – Between May 17 and September 2, 1993, 13 pre-auction seminars were held in 9 districts of Romania. The seminars were attended by 743 persons, 525 of whom were farmers and 218 as observers. Thus, the seminars served to inform potential purchasers about auction procedures and provided an opportunity to the general public to be introduced to basic free market economics.

The participants in the pre-auction seminars were informed that purchases of the feed supplement would be limited to the following types of private enterprises:

1. Commercial Societies registered under law CS 31/1990. These companies were required to present registration papers and the contracts of their companies showing ownership.
2. Agricultural Associations registered under law 36/1991. These associations were also required to present registration documents and the contracts of the association which indicated the entities that were members.
3. Nonjuridical Associations which were informally organized without registration. These groups were required to present a letter signed by the mayor of their village indicating that they were private farmers and denoting the number of animals owned.
4. Individuals were required to present identification and a letter from the mayor of their village indicating that they were a private farmer.

Individuals (40%) and commercial societies (39%) comprised a majority of the participants. However, on a percentage basis participation in the second seminar by individuals decreased dramatically to 24% of total participants and that of commercial societies increased to 61% of total participants.

Proceedings of the First Series of Auctions — The first auction was scheduled to precede the arrival of the first importation of feed supplement. Auctions were scheduled to begin in Giurgiu on June 18, 1993, and to continue in seven locations until June 29, 1993. Unlike the seminars, the auctions were held on consecutive days to allow clear determination of the results and to monitor farmers who participated in more than one auction.

During the first auction, a total of 10,220 mt of feed supplement was auctioned in the eight locations. A reserve of 380 mt was withheld pending unloading of the cargo. After the ship was unloaded, it appeared that only 240 mt remained. IFDC had hired Control Union, a certified marine surveyor, to verify quantity and quality of the cargo. Their report showed that the cargo was short-loaded by 4,878 bags or 122 mt. The losses at the port were minimal, only 18 bags and the total landed cost for the first shipment of swine feed supplement was US \$457/mt of net cargo.

More than 22,000 mt of supplement was demanded in the initial bids at the eight locations. This response shows a viable Romanian market among private farmers for protein feed supplement at or near world market prices. Sales in this series of auctions were limited to private-sector farms and purchases were limited to a maximum of 500 mt and a minimum of 10 mt per buyer, which could have further decreased the demand from both small and large farmers.

A total of 77 buyers representing 31 districts of Romania purchased swine feed supplement in the first auction where 10,220 mt of supplement was sold. In round figures, the average purchase price was US \$309/mt with the price range of between US \$215 and US \$449. It is important to note that these prices are very comparable to world market prices and represent an excellent introduction of market economics in Romania. The landed cost of US \$457/mt is not typical of commercial practice; the Grant required that U.S.

flagships be used for transport. The U.S. flagship transport costs may be as much as 50% higher than those of non-U.S. flagships.

Port Operations During the First Shipment of Feed Supplement – The official tally prepared by Control Union showed that the cargo was short loaded by 4,878 bags or 122 mt. Of the cargo received, 740 bags or 18.5 mt were received in poor condition – wet, oily, torn, or spilled. This supplement remained in the warehouse at the end of operations to be recovered or disposed of by the agents of the shipowner. Of this 740 bags, 183 bags or 4.6 mt were rebagged aboard the vessel and fully recovered; 21 bags or 0.5 mt were disposed of as floor sweeping of no value; the remaining bags could not be accounted for. The 4,878 bags or 122 mt that were reported as short loaded were claimed by IFDC and settled with the shipowners at a value of cost plus freight of about US \$51,000, or about US \$418/mt.

Monitoring of the First Shipment of Feed Supplement – During the period immediately following the last auction of the first shipment, the first 3 weeks in July, all of the buyers were visited by the IFDC monitoring staff. These initial visits were to locate the farms, enable the buyers to become acquainted with the program and staff, and arrange for the selection and tagging of animals for monitoring. All 77 buyers were visited. Many of the buyers stated that their swine had improved during only the first 2 weeks of supplement use. The major improvement was a decrease in the incidence of mortality caused by diarrhea among weaned pigs. The monitoring revealed that the feed supplement purchased by five buyers from the village of Casvana (50 mt) may have been resold to a state farm in the area. Subsequent monitoring visits to Casvana and the state farm in question confirmed that 20 mt of feed was, indeed, purchased by a state farm.

Allowing purchases of 1 lot without letters of guarantee resulted in speculation. To prevent this in the future, all bidders were required to have bank letters of guarantee for purchases during the second round of auctions. As an accommodation for smallholders, the minimum purchase for the second auction was decreased to 5 mt but required a letter of guarantee.

Proceedings of the Second Series of Auctions – The auctions of swine and poultry feed supplement preceded the arrival of the second cargo. Auctions began at Cluj-Napoca on September 28, 1993, and continued at three locations until completion on October 7, 1993. The auctions were held over a 2-week period to allow the participants to attend and bid in multiple auctions.

After all farmers were registered, both the poultry and swine supplement bid boxes were opened at 10:00 a.m. at each auction. However, as in the first series of auctions, any person who was in the process of registering at the time of the scheduled bid opening was allowed to finish the registration and submit a sealed bid tender for that auction. The elimination of the two-auction procedure used for the first shipment was justified because most participants were familiar with procedures and able to define a bidding strategy in one auction. As a result of this change, there was an increase in the percentage of buyers that participated in multiple locations. For example, half of the participants at the Cluj auction had attended previous auctions. This strategy could have been the result of a combination of the removal of the second opportunity to bid at each location and the increased demand indicated by the increased number of bidders at each location. During the first series of auctions, an average of 13 bidders (104 total) participated at a location. This number increased to 36 (146 total) during the second series of auctions. There were 54 unique² winners during the four auctions. This compares with 77 unique winners in the first auction. Of these 54, there were 7 new winners for swine supplement and 12 new winners for poultry supplement, that is farmers who were not in the first group of 77.

Swine Feed Supplement – About 90% of the swine feed supplement in the second auction was purchased by commercial societies, 9.0% by agricultural companies, and only about 1% by individual farmers. In round figures the mean price paid for the supplement was US \$492 with a range of US \$343 and US \$780. The greatest range in prices was paid by commercial societies (US \$343-\$780), which is evidence of an authentic and enthusiastic interest in the product.

²Unique buyers" refers to the total number of individuals who purchased animal feed supplement. These unique buyers may have made a single purchase of one type of supplement or may have made multiple purchases of one or both supplements.

The districts of Constanta, Cluj, Vrancea, Tulcea, Prahova, Mures, Iasi, Braila, and Bucharest accounted for about 80% of the total supplement purchased. The average price paid was about US \$492 and the average price ranged from US \$353 to US \$802 in round figures. A total of 34 purchasers from 18 districts of Romania made swine feed purchases in the second auction.

Poultry Feed Supplement – The purchase of poultry feed supplement in the second auction was dominated by commercial societies who purchased about 99% of the product. Individuals and nonjudicial associations made no purchases. Agricultural companies paid an average of US \$588/mt compared to US \$482 by commercial societies or about 18% less than agricultural associations. Prices paid ranged from US \$365 to US \$675 in round figures.

The data show that 27 buyers from 17 districts purchased 2,400 mt of supplement at an average price of US \$484/mt. The prices paid per metric ton ranged from US \$376 to US \$662 in round figures. About 55% of the supplement was purchased by 5 of the 17 districts represented in the auction. Again, the prices paid for the supplement in the second series of auctions met or exceeded international market prices.

Price Discovery³

One objective of the Romanian commodity import program was to provide the newly privatized Romanian farmers with a price discovery experience. This was accomplished through a series of 24 auctions held at 8 regional sites in two time periods, June and September-October, 1993. The eight regional sites were Arad, Braila, Bucharest, Cluj, Constanta, Craiova, Giurgiu, and Iasi. Consultants from Ohio State University (OSU) assisted IFDC in accomplishing this component of the project.

Several auction price measures were used. They included: maximum award price, average award price, market clearing price, average bid price, and the minimum bid price. Each contributed to an understanding of bidder behavior and efficiency of price discovery at the auctions. A brief discussion of these measures follows.

³Price discovery refers to the process of determining free-market prices.

The *maximum award price* is the highest price tendered in each auction. The average award price is the weighted average price of all winning bids, determined by weighting each bid price by its respective bid quantity.

The *market clearing price* is the price at the point where supply and demand are equated and all bid prices equal to this price and greater are awarded the quantity bid. This price was readily observable by all bidders and understood as the minimum price needed to receive supplement at the auction.

The *average bid price* is determined by weighting each bid price by its respective bid quantity. This price incorporates the full distribution of winning and losing bids.

The *minimum bid price* is the lowest bid price submitted at each auction. In many cases this price was just higher than the established floor price.

With some minor exceptions, all prices were higher at later auctions, representing a better understanding of prevailing prices learned from earlier auctions, and a high level of unsatisfied demand trying to buy a declining quantity of supply. In most auctions, the average award price ranged from 5% to 15% above the market clearing price, indicating a fairly tight distribution of winning bids and a reasonably accurate level of price discovery for most of the bidders.

The quantity of supplement offered at each auction was determined by the concentration of private swine farms in each auction region and by estimated demand for supplement revealed by the farmers on pre-auction seminar questionnaires.

A repeat appearance of many unsuccessful early bidders at subsequent auctions, especially during the September-October 1993 auctions for the second shipment, resulted in some unanticipated outcomes. After the first bidding experience, unsuccessful bidders were better informed of auction clearing prices, and often traveled to the next region to bid aggressively and satisfy most of their supplement needs.

In total, bidders from each region during the September-October 1993 auctions satisfied a higher quantity of their demand at auctions other than their own regional auction, generally at the succeeding auction. This underscores the importance of prior price information in directing bidders to pricing decisions.

Regression analysis was used to determine the influence of various factors on auction price formation. The dependent variable was average award price at each auction. Independent variables included supply, demand, prior knowledge, and transport distance. The adjusted R square shows that 96% of the variation in the average award price is explained by the independent variables. The standard error of the equation was US 2.03 cents/kg in comparison to the mean average award price of US 37.46 cents/kg.

Prior Knowledge

The coefficient of prior knowledge (learning from others about previous prices paid) from the previous auctions, based on lagged market clearing price, was positive. For the June auctions a US 1 cent/kg increase in the prior knowledge variable resulted in the average award price increasing US 0.548 cent/kg.

In the September-October 1993 auctions a US 1 cent/kg change in the prior knowledge variable resulted in a US 0.8723 cent/kg change in the average award price. These coefficients indicate that knowledge of prior auction results was highly significant in influencing the current auction.

Supply

Long run supply had a negative coefficient since rationing of the supply occurred at all auctions. The total supply was known at the beginning of the auctions with the total quantity available for sale diminishing at the conclusion of each auction. The June 1993 auction coefficient indicates that the average award price increased by US 0.38859 cent/kg for every 1,000 mt decrease in the remaining total supply at the June auctions.

The long run supply coefficient for the October 1993 auctions, incorporating a slope shifter, reveals the average award price increased by US 3.339 cents/kg for every 1,000 mt decrease in the remaining total supply. Thus, after selling 1,000 mt at the first auction for

swine supplement in October, the average award price was estimated to increase by US 3.339 cents/kg due entirely to diminished supply.

Demand

The coefficient for the total quantity demanded at an auction was positive indicating that higher demand resulted in a higher average award price, increasing by US 2.342 cents/kg for each additional 1,000 mt of supplement demanded.

Distance

Farmer bid prices reflected transportation cost discounts for distance from the delivery point, Constanta Port, to the farm. The level of estimated discount was US \$10.79/mt for every 100 km between their farms and the port of Constanta.

In comparison, the state operated feed company, *Nutricomb*, provided a schedule of railway freight charges with a cost of US \$3.82/mt for a 100 km transport, not including loading and local delivery fees. Even if these charges are included, it appears that private farmers were decreasing their bid prices by more than the cost of commercial transportation, indicating an economic incentive exists to arbitrage the transportation differential and further develop the agricultural inputs infrastructure.

Performance of the Swine and Poultry Feed Supplement

Characteristics of the Swine Sample

To monitor and evaluate the performance of the swine feed supplement, 42 farms in 30 districts were sampled between August 1993 and April 1994. The sample comprised 293 hogs and 298 piglets for a total of 591 animals. In August 1993 baseline data were gathered on the performance of local feed, that is performance prior to using the imported high protein supplement. After baseline data were collected, monitoring and evaluation of the performance of the feed supplement was conducted periodically from October 1993 to April 1994. The feeding recommendations of IFDC and the American Soybean Association (ASA) were not always followed due to constraints in the availability of the appropriate grain and/or a sufficient amount of the IFDC-imported high protein feed supplement.

The basis of the swine feed varied during the monitoring period. During August-October 1993, barley was used, and from November-April 1993, maize was used. The performance of the supplement was also affected by unusually cold weather in November 1993 after a short period of warm weather followed by a wave of cold weather in January and February 1994. A lack of fuel for heating was a critical problem that stopped breeding in the winter of 1993-94.

Performance Indicators of the Swine Feed Supplement

Prior to use of the supplement imported by IFDC, an average of 285 days was required for a hog to reach a marketable weight of about 100 kg. On average this time requirement was decreased by 65 days to 220 days or by 23% following the use of the imported protein supplement. The performance of the supplement was also impressive as indicated by a mean daily live weight gain of 0.56 kg compared with 0.39 kg before supplement use. Thus, on average hogs gained about 17 kg per month with the imported protein supplement, compared to 12 kg previously.

The amount of feed needed to produce 1 kg of hog live weight declined substantially from 9 kg to 6 kg after supplement use – a 33% decrease. The mean weight of weaned piglets per sow at 21 days increased dramatically from 32 kg before supplement use to 46 kg after use – a 44% increase. The mean piglet weight at 21 days increased to 5.5 kg after supplement use compared with 4 kg prior to use; an increase of 38%. Finally, the mean number of piglets per sow increased from 8 before supplement use to 9 after use.

Performance of the Poultry Feed Supplement

Broilers – During 54 days in November-December 1993, a controlled experiment with 140,000 broilers was conducted to determine the performance of the poultry feed supplement imported by IFDC. The sample was divided into four experimental groups and one control group. The experimental groups received the imported supplement and the control group received a domestic feed of maize and sunflowers. During the first week the experimental groups received feed with 22.0% crude protein, 20.0% in the second and third weeks, and 16.0% from the fourth week until slaughtering. The recommended practice of feeding broilers 18.0% crude protein during the finishing stage was not followed because

only a limited quantity of 80 mt of supplement was purchased by the farm in the Constanta district where the experiment was conducted.

The performance of the poultry feed supplement for broilers in each sample was superior to that of the control group. The mean live weight gain during 54 days in each sample exceeded that of the control group by 30%-40%.

The mean feed conversion rate was decreased by about 25% from 3.2 kg to 2.4 kg. Most significantly, on an average the mortality rate of the samples was 64% less than that of the control group.

In addition to the above controlled experiment, broiler production and performance of the feed supplement was monitored on nine farms with data collected on a total of 115,000 broilers. The base feed of maize/wheat (75%), fish meal (5%), and imported protein supplement (20%) was constant during the monitoring period of 54 days. The performance of the feed supplement was very similar to the results of the controlled experiment. Specifically, at the end of 54 days, the average live weight was 1.7 kg with a feed conversion rate of 2.2 kg feed for 1 kg live weight gain. Prior to the use of protein supplement, these figures reported by the farmer were 3.5 kg feed for 1 kg live weight gain with an average market weight of between 0.7 kg and 1.0 kg after 95-100 days.

Layers – Between August 1993 and April 1994, attention was also given to the performance of the feed supplement for layers. Although the data are inconclusive, three private farms reported the number of eggs produced per 100 hens increased by an average of 19% when using the supplement imported by IFDC. Furthermore, total feed consumption decreased 12% and on an average the feed conversion rate in terms of egg production improved by 17%.

The severe winter of 1993-94 without heat for the hen houses, the low level use of the poultry supplement by farmers because of depressed egg prices due to an abundance of imports, and a common feed for broilers and hens, all contributed to inconclusive and mixed results. Some farmers reported a decrease in egg production and attributed this to the supplement. This conjecture is unfounded. Undoubtedly, future controlled experiments shall

show better results provided the supplement is used properly and other growing/egg production conditions are controlled. It is important to note that eggs are not graded by size in Romania and total eggs rather than weight per egg is a measure of performance that is currently most meaningful to farmers.

The data on the performance of the feed supplement for swine and broilers show excellent results. The data for layers are inconclusive. The outstanding results stimulated interest and demand for supplement among Romanian farmers. Unfortunately, as this demand flourished, the supply was interrupted and demand was created for an unavailable product. This was disappointing, indeed very disappointing, for farmers who survive on the margin. The policy of GOR not to allow importers to convert local currency into U.S. dollars eliminated the participation of U.S. suppliers in exporting high-quality feed supplements to Romania.

Special Account for Local Currency Generated From the Auctions

On February 21, 1994, Coopers and Lybrand (CL) issued a final report on the status of the special MOA/MOF account (No. 64.26.01.60) held with Banca Agricola. An updated final report was issued by CL on March 31, 1994, to reflect an additional deposit of 500 lei and to correct a typographical error in the February 21 report. The updated CL Final Report shows the balance in the special account as of March 11, 1994, as 6,285,957,923 lei consisting of deposits and interest payments as follows:

Type of Deposit	Amount in Lei
First set of auctions	2,356,991,725
Sales at farmers' fair	21,191,600
Second set of auctions	2,912,433,000
Payment from reserved quantity	39,300,000
Port and office sales	81,116,345
Interest earned, June 1993 through February 1994	874,925,253
Total of deposits and interest	6,285,957,923

As of March 31 (at which time US \$1 = 1,650 lei) the amount in the special bank account was US \$3,809,671.47. The above total amount agrees with the bank statement issued by Banca Agricola on March 11, 1994. The March 11, 1994, CL accounting statement was sent to USAID/Romania and USAID/Washington at the end of March 1994, thus fulfilling IFDC's responsibility for the special account.

Recommendations for Animal Waste Management

The environmental problems related to waste (primarily manure and liquid effluents) from swine and poultry in Romania can be attributed to several factors including (1) lack of supportive government policy and incentives, (2) technical problems in system design, (3) management and maintenance problems, (4) socio-economic problems, and (5) lack of understanding about, and support for, recycling nutrients from animal waste to improve crop production.

With a population of about 11 million swine and over 100 million chickens, the annual production of animal waste is in excess of 12 million mt not to mention huge volumes of contaminated liquid effluents. The 12 million mt of manure produced annually contains an estimated 100,000 mt nitrogen (N), 75,000 mt phosphorus (P), and 80,000 mt potassium (K).

A well-coordinated and concerted effort with commitments from the GOR and the donor community is required to define and implement beneficial policies to mitigate environmental problems of waste management in Romania. For example, the EU nitrate directive (91/676/EEC) requires the identification and designation of sensitive waters and critical zones that potentially contribute to pollution. This type of reporting requires extensive sampling and data analyses of soil, manure applications, and the water resource.

The problem of environmental pollution from animal waste could be mitigated through the following activities:

- A national conference for Romanian livestock producers, MAPPM, MAA, Ministry of Education, various technical institutes, and Romanian and international animal waste

experts. Such a conference should analyze the problems from various perspectives and recommend solutions.

- A study tour of animal waste management facilities in the United States and elsewhere for several livestock producers, MAPPM technical representatives, and MAA technical representatives to enable them to observe and gain familiarity with the most appropriate technology.
- A comprehensive surface and groundwater monitoring and documentation program to support environmental policy decisionmaking and enforcement.
- An assessment of the economics of the livestock industry to determine the benefits of investments in capital facilities to manage waste in an environmentally sound manner.
- Guidance for the development and implementation of a program of government policy, incentives, and regulations to eliminate or at least decrease discharges of animal waste, preferably by use in agriculture. Secure and legal titles to land are necessary to promote the use of animal waste for crop production so that waste becomes an economic asset rather than an environmental liability.
- Technical assistance and financial resources for feasibility studies and renovation of facilities to promote the use of animal waste for agricultural purposes.
- A program of research, demonstration, and education to support the economic and efficient use of animal waste in agriculture. Alternative technologies, such as the generation of biomethane and other more capital-intensive processes, should be considered as potential means to enhance the economic and environmental performance of livestock production.
- Programs for the recruitment, support, training, and use of animal waste engineers to provide the private sector with technical analyses on design, renovation, construction, management, and support services for waste management.

- Enhancement of the agricultural engineering, animal science, and soil science curricula of Romanian institutes and universities in the areas of waste management, use, and environment. Such training would provide well-trained Romanian nationals to design, monitor, and regulate animal waste management and performance.
- Technical assistance for MAPPM and MAA to develop beneficial policy, rules, design guidelines, monitoring procedures, and staff training for the regulation of animal waste.

Policy Issues on the Supply and Use of Farm Inputs

The year 1994 represented a significant turning point in the transition process for the Romanian economy after 4 years of decline due to the partial dismantling of the centralized economic controls. Significant factors for the turnaround were (1) monetary policies which significantly decreased inflation by stabilizing the value of the Romanian currency and decreased the uncertainty in the Romanian marketplace, (2) favorable weather conditions which led to increased agricultural crop production for the first time since 1989, and (3) an increase in manufacturing output leading to some improvements in the external balance of trade. Macroeconomic results in 1994 exceeded International Monetary Fund (IMF) targets, but progress on privatization and the implementation of commercial laws has been slow.

Romanian policies for reform in consultation and in accord with the IMF include, along with other things (1) decreasing inflation from an annual rate of 75% in 1994 to 30% in 1995, (2) decreasing the current account deficit, (3) creating and maintaining a free foreign exchange market, and (4) accelerating the privatization process and the reform of bankruptcy, securities, and competition laws. The independence of the Central Bank has been actively supported by the IMF and now seems to be assured. The importance of this cannot be overemphasized in its impact on the stability of the economy generally and monetary and credit controls in particular. Without a decrease in inflation and improved exchange rate (ER) stability, the required domestic and foreign investment will not occur and the credit supply to agriculture for farm and agribusiness enterprises will continue to be one of the major constraints to improved output. As inflation and ER stability is

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strengthened, a careful relaxation of the credit constraints, combined with fiscal reforms designed to stimulate the economy, may become desirable and perhaps necessary to facilitate economic recovery. But, at this stage, further control of inflation and stability of ER are of critical importance.

Several contradictory and conflicting policies still exist as constraints to the development of open competitive markets in the supply of animal feed, fertilizers, and other critical farm inputs. A listing and brief discussion of the key issues and specific policy recommendations follow:

1. Inflation control is being exercised by the Central Bank in a sound manner, but the notion that further control can be exercised by fixing prices is not conducive to market development. All prices have to be effectively and permanently decontrolled so that competition can act freely to contain prices and a market economy can develop. At this stage, market development is distorted in all possible ways.
 2. Social security "safety net" policies for the urban poor should be in the form of direct assistance and not through the lowering of basic food prices which constrain incentives for increased farm production and efficiency in food processing. Food processing subsidies and price fixing should be replaced by targeted welfare assistance for the urban poor.
 3. The structure of the farm population and its organization are, at this time, murky. This creates uncertainty for all agribusiness and reinforces the need to expedite the cadastral survey, issuing of land titles, and a legal entity framework for family associations and the planned agricultural census.
 4. Although approximately 80% of agricultural production is now reportedly "controlled" by the private sector, much of it is organized in a fragmented or loosely consolidated manner and the farming operations are not based on full ownership. The farm input supply and farm output marketing remains in the state sector parastatals and enterprises that are not established or attuned to dealing with the needs of the private sector in a competitive and efficient manner.
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5. Autonomy has seemingly been given to most state enterprises serving agriculture but central control and administration structures have not been dismantled and their continued presence allows continued ad hoc market interventions, the source of extreme uncertainty in the marketplace.
6. Although sincere efforts have been made to treat both public and private sectors equally, for example, in the supply of subsidized credit and fertilizer, institutional arrangements are not in place for equal and equitable delivery of inputs and services to the private sector.
7. Restructuring and/or privatization of agribusiness enterprises has been virtually nonexistent to date and technical solutions to the privatization of organizations such as Romcereal are not apparent even though the GOR has agreed in principle to privatization.
8. Although import and export controls of farm inputs have been relaxed and opened to the private sector, bureaucratic controls and licenses and constraints on the credit supply to private importers are impeding the free trade in inputs and technology and the alignment of the Romanian farm sector with international trade.
9. Although the GOR policy is to encourage the development of private professional and producer associations, the experience of the only producer association formed to date (ARCA) in its relation with government has been negative. Development of these organizations as representatives of subsectors has a role in diffusion of technology through inputs, services, and the extension of knowledge. As genuine representatives, such associations have a valuable and viable role to play in presenting private sector viewpoints to government.

Specific Policy Recommendations

The IFDC recommends the following specific policies for implementation by the GOR:

1. Agricultural price interventions for wheat, meat, and milk should be removed and replaced with targeted welfare assistance for the urban poor.
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2. A price stabilization scheme should be introduced for the major cereals based on import parity prices combined with seasonal incentives in which the government would act as a buyer of the last resort from any party, including Romcereal. Romcereal would be compensated for administering and storing government grain stocks separately from its commercial transactions using bonded warehouses/silos.
3. Privatization of Romcereal is not recommended at this time. Its immediate restructuring, however, is recommended to promote a more competitive grain market. This restructuring should be based on completely autonomous judet level organizations free to set their own seasonal and grain grading prices for buying, selling, drying and storage, and freedom to set employment levels, implement cost decreases, and take responsibility for overall management.
4. Restructuring of Romcereal should be accompanied by recapitalization of each autonomous organization and the offering of technical assistance in competitive business operations. All subsidies to Romcereal should be removed. Access to credit should be only at commercial interest rates with complete financial responsibility.
5. Those Nutricomb facilities that are potentially competitive should be completely privatized during 1995.
6. It is envisaged that Romcereal and Nutricomb will develop competitive grain buying and selling activities utilizing private sector traders to access the private farm sector. The organizations should be allowed to undertake these responsibilities but with complete financial responsibility.
7. The current subsidized Romcereal fertilizer scheme and subsidized credit program should be withdrawn after the spring 1995 cropping season and all subsidies for farm inputs phased out by 1996. Access to farm input supplies is more critical than their cost. Therefore, positive steps should be taken to encourage the pervasive development of farm input distribution systems by the private sector in competition with the autonomous Agricultural Supply Units, whose state-conferred monopoly powers and

subsidy advantages should be eliminated to encourage the development of the private sector.

8. The Agrimech enterprises should be privatized during 1995 by auctioning all equipment for vouchers or cash. Equipment should be auctioned as individual units to allow private potential buyers, including current employees, to freely accumulate desired inventories of farm machinery and repair parts which can then be used to provide competitive farm mechanization services. Purchases by state farms or farm associations is also an option/alternative.
9. Consideration should be given to providing a legal entity framework for family associations so that beneficial impacts from these informal associations can be derived.
10. All available resources should be made available to complete the cadastral survey, issue land titles, and establish a land market. Combined with the macroeconomic reforms to contain inflation, this action will provide the collateral requirements for access to commercial credit.

Support Programs Recommended to Stimulate Economic Development of Small Private Farmers

The lack of services specifically for small private farmers and family associations is typical of the evolutionary transition stage from a centrally planned agricultural sector to an open competitive market. IFDC experience in other transforming economies has highlighted the need for continuing support of the evolution of policy actions and steps which are consistent with the overall policy framework. The provision of technical assistance to foster the emergence of competitive private entrepreneurs to provide marketing services to small farmers is central to stimulating economic development in agriculture. This process is highly suited to a development aid project. This type of project is currently not being addressed in Romania by the donor agencies. It is therefore strongly recommended to USAID/Romania that tangible assistance in support of small private farmers be provided by projects

ted to quantifiable policy benchmarks for the disbursement of subsequent tranches of grant funds.

Specifically, a project designed to foster the development of entrepreneurs who would be engaged in the supply of farm production inputs (feed, fertilizer, plant protection products, machinery, and technology) is needed urgently. The development of a private agri-inputs sector is central and essential to the process of linking the farm family with the sources of supply of production inputs and services. Also, the private inputs supply sector can play a dynamic role in linking the farmer with markets for surplus production.

The project should focus on the provision of technical assistance designed to strengthen the emerging private agri-inputs sector to enable it to provide products and services to the private farm sector. A high priority should be given to developing the agri-inputs distribution systems and to expand the marketing services offered to the private farm sector by the former state enterprises and the emerging agribusiness entrepreneurs.

Furthermore, the immediate implementation of a project to foster the development of a private agri-inputs marketing sector will help to focus attention on the constraints to development and thus hasten the implementation of GOR policy reforms designed to facilitate the market reform process.

Programming Romanian Cadastre Funds Generated From the Commodity Import Grant Program

Public and Private Cadastres

There are at least six cadastral surveys being conducted by various ministries in Romania. However, the most important concerns surveying land parcels to grant land titles to private holders. This survey is being conducted by MOA. It is important to note there is a law under discussion in Parliament (Lege Privind Cadastral General) that would place all cadastral surveys under the same agency who would be responsible for any special cadastre.

Originally, there were about 20-25 million parcels of land to be surveyed. It is also estimated that there will be about 5 million people in Romania who will eventually own land. However, to allow roads, easements, liens, and the associated provisions for providing access to small parcels of land, it is now estimated that there are more than 50 million parcels of land to survey, more than double the number originally estimated. It is expected that it will take from 6 to 10 years to complete the survey. The cadastre will maintain three types of registers; an alphabetical list of owners, a list of parcels showing ownership, and a list of owners showing each parcel owned.

The Role of MAA

The MAA has been authorized to implement the CIGA based on letter No. 105649 dated December 9, 1992. An agreement was signed between the MAA and the MOF on April 15, 1993. This agreement describes how the program is to be conducted and the responsibility of each ministry. The MOF has delegated the full authority and responsibility to the MAA for implementing the CIGA. The MAA will provide the MOF with (1) copies of information sent to USAID within 48 hours, (2) a report on each step of the project, (3) a report summarizing activities during each quarter, and (4) a report on any modifications to the project within 4-5 days from the end of each quarter. The MAA is also to confirm to the MOF that the funds in foreign and local currency resulting from the CIGA have been used in accordance with the provisions of the agreement, together with justifying reports and auditing documents.

The Role of MOF

The MOF shall provide financial supervision for the project. The MOF has an account with the Banca Agricola. The minister has informed USAID in a letter dated February 23, 1993, that this account is a separate account numbered 64.26.01.60 and is a non-commingled, interest-bearing account to receive local deposits in lei from the auction of the feed supplement under the CIGA. Purchases of equipment and supplies for the cadastral survey will be charged to this account.

According to Section 3.1 of the MAA/MOF agreement, the disbursements in lei from the special account will be made only with the approval of the MOF, after the confirmation

of USAID that the MAA has fulfilled its obligations. Also according to Section 2.1 of the MOF/MAA agreement, the MOF must agree in writing on how the funds are used.

The Role of IFDC

IFDC will provide support to the cadastral survey in the areas of programming, budgeting, and the development of a reporting and evaluation system. Equipment and supplies to be purchased have been preliminarily identified. A budget will be developed and submitted to USAID by the MAA as soon as approvals for these items are received from the MOF and USAID. A system of evaluation and reporting is being developed jointly with the Directorate of the Geodesy and MAA personnel. The main contact of IFDC has been the Directorate of the Geodesy. The Directorate of the Geodesy performs the surveys and requires equipment and supplies for the cadastre. The Directorate of the Cadastre documents the work and maintains the cadastre registry. IFDC will assist the Directorate of the Geodesy in the preparation and submission of reports on equipment purchases. Subsequent to the expiration of this grant on December 31, 1994, a new grant/contract is being negotiated to continue IFDC's support to the Directorate of Cadastre.

Problems and Recommendations

There were initial problems in convincing customs officials that the IFDC-imported feed supplement was exempt from all duties, fees, and taxes as stated in the agreement between the U.S. Government and the GOR. This is a result of the terms of the agreement not being shared or understood at all levels of GOR.

A minimal amount of the feed supplement purchased by private farmers was resold to state farms. Such behavior is probably unavoidable and those who participated in the diversion were excluded from participating in future auctions.

The approval for IFDC to work in Romania as a nonprofit organization was not obtained until April 28, 1994. The advantage of this legal status is that checks can be written by IFDC on the local currency bank account. The delay was cumbersome but unavoidable.

The GSM-102 program of the U.S. Department of Agriculture is contrary to the development of private animal production in Romania. The program provided about US \$52 million in credit for the GOR to purchase U.S.-grown soybeans. Following crushing, the meal is made available to enterprises owned by the state. Contrary to popular conception, the struggling private sector has no access to the meal yet he must compete with subsidized state enterprises. Thus, two policies are evident in Romania, one that attempts to strengthen the private sector and the other that supports state-owned animal production at the expense of the emerging private sector.

Furthermore, as the project approached conclusion, it became clear that the effort would not be sustained with funding from USAID. The project was clearly successful in introducing and creating a demand for, and interest in, high quality animal feed supplement. There is no disagreement on this point by anyone familiar with the project. As the project ended so did the supply of imported supplement. Those who produce swine on a small scale in the private sector are baffled and discouraged about the abrupt end to the supply of feed supplement.

Thus, the project simultaneously encouraged and discouraged small scale producers. Succinctly, the project introduced a beneficial and attractive commodity that is no longer available in Romania, at least in the short-to-medium term.

Final Project Report

Support to Romania Agricultural Sector Grant Program

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Support to Romania Agricultural Sector Grant Program

Introduction

Geographical Location

Romania is a republic in southeastern Europe and is located centrally in the Balkan Peninsula. It is bordered by the Black Sea to the southeast, Bulgaria to the south, Serbia to the southwest, Ukraine to the north, Hungary to the northwest, and Moldova to the northeast. The area of Romania is 237,000 km² or 91,699 square miles. Figure 1 shows a map of Romania by judet or district.

Climate

The climate of Romania is continental with hot summers and cold and snowy winters. The summer season is milder and wetter in the mountains, and the winters on the coast are moderated by the Black Sea. The northern and eastern regions of Romania are likely to experience drought if the summer season is dry. The average rainfall in Romania ranges from 400 mm in the Danube delta to 1,000 mm in the Carpathian Mountains and Transylvania Alps. The average rainfall for the entire country is about 637 mm or 25 inches.

Population

The population of Romania in 1993 was about 23.7 million persons with a density of about 96 persons/km². The population is decreasing by -0.1% annually and is expected to reach 23 million in 2010 and remain at that number until 2025.

Political Economy

Since the revolution of December 1989, the process of transition to a market economy has been more difficult in Romania than in other countries of central and eastern Europe. The economic performance of Romania in 1992 was poorer for most indicators than the eastern European economies, excepting Albania and the former Yugoslavia.

According to official statistics the gross domestic product (GDP) of Romania decreased by 15.4% in 1992, the greatest recorded decrease in central and eastern Europe. This decrease followed those of 1990 and 1991, 7.4% and 13.7%, respectively. Thus, the GDP of Romania decreased by about 33.0% during the 3 years following the collapse of communism. The poor economic performance of Romania is further evident in that industrial output decreased by 22.5% in 1992 and by 1993 was half of that in 1989. A limited recovery was evident in 1993 when GDP increased by 1.0%, the agricultural sector by 12.4%, industry by 1.3%, and construction by 0.7%. The rate of inflation was 210% in 1992 and 296% in 1993.

Romania was the only country to record a decrease in exports to the west in 1992 when exports decreased from US \$3.9 billion to US \$2.4 billion. At the same time, imports from the west increased from US \$1.2 billion in 1989 to US \$3.0 billion in 1992. This contributed to balance-of-payments deficits of US \$1.7 billion in 1990 and US \$1.4 billion in both 1991 and 1992. This resulted in a net foreign debt of about US \$3.0 billion at the end of 1992 compared to a net creditor position of US \$1.2 billion at the end of 1989.

Following the election of Petre Roman as Prime Minister in May of 1990, the Government of Romania (GOR) supported a rapid transition to a market economy. In 1990, Roman introduced a detailed package of reforms which was to involve the transition to a western European style of market economy within 2 years. This would involve measures to make the currency fully convertible in the long term and to expose domestic enterprises to international competition, the introduction to a two-tier system of banking, incorporating a central bank and independent commercial banks, liberalization of wholesale and retail prices, the restructuring of industry away from "smoke stack" industries to modern light industry, removal of restrictions on small-scale private enterprises, privatization of state industry, tax reform, creation of a state welfare system, and land reform.

The implementation of these reforms is continuing but the pace of change in Romania is slow, particularly in comparison with other countries in central and eastern Europe. Major successes have occurred in the privatization of agriculture. By the end of 1992, 70% of farmland had been nominally returned to private ownership, although many issues related to titles of ownership remain unresolved. A national cadastre remains to be completed in

Romania, but is an essential requirement for completion of land reform, legal ownership, and determination of value as a basis of just taxation.

Secure land title and ownership provide a fundamental basis for agricultural investment and development. This is understood and accepted by the GOR but funds to support a national cadastre were limited and that constraint required some creative international cooperation to overcome. To generate local currency for a cadastre the United States Agency for International Development (USAID) and the GOR agreed to improve the production of swine and poultry through a project that would generate local currency for a cadastre. Furthermore, the project would introduce the free-market to Romanian farmers and provide a national demonstration of the benefits of that economic system. The International Fertilizer Development Center (IFDC) was asked and agreed to develop a program that would improve the production of swine and poultry and generate the local currency for a national cadastre.

Support to Romania Agricultural Sector Grant Program

Project Background

In August and October of 1992, IFDC conducted fact-finding missions to Romania that were funded by USAID. The purpose of the missions was to develop a program to provide assistance to the struggling private sector swine and poultry operations which were created after the revolution of 1989. One constraint in this private sector was a short supply of swine and poultry feed supplement. An adequate supply of protein-based feed supplement would shorten the feeding cycle for swine and poultry and create an opportunity to earn profits. IFDC assessed the immediate market potential for the feed supplement and designed a program to provide Romanian farmers with a free market experience through the competitive auctions of the feed supplement.

In October of 1992 a report on the first fact-finding mission entitled "Romania Commodities Import Program" was submitted to USAID. That report documented that 78 swine firms with production greater than 5,000 animals per year and 70 layer and 60 broiler operations were incorporated and registered as private companies and operate

outside the system that supplies animal feed to the state-owned farms. The private companies had an acute shortage of protein for livestock production which resulted in poorer quality, longer periods for reaching optimum weight, decreased productivity, and increased production costs. In addition to these 208 firms, in excess of 600 small-scale swine operations that were also in need of protein feed supplement were identified. The report indicated that the state-owned farms had comparatively greater access to credit and feed supplement than private farms. This constitutes an additional reason for importation of protein supplement to be auctioned to the private sector exclusively.

The annual demand for protein supplement is estimated to be 1.1 million mt. Although there are various high protein feed sources produced locally, primarily sunflower and some soybean, Romania is not self-sufficient in protein meal production and would have to import between 300,000 and 1.2 million mt annually to satisfy domestic demand. Production of soybeans has declined seriously. In the period 1979-81, domestic production averaged over 360,000 mt annually but decreased to 141,000 mt in 1990 and has not yet recovered. Recent data on soybean imports show that only 43.0% of previous quantities of soybeans are being imported. The imported soybean meal distributed by the state-owned feed mills is used primarily by state-owned farms and the private sector has no access to those imports.

Most of the private swine farms use low-protein feeds made of corn or barley, which results in virtually doubling the production time when compared with the balanced feeding of 20%-25% high-protein supplement prepared from 40%-42% protein supplement plus vitamins and minerals mixed with carbohydrates. Therefore, the availability of a high protein supplement would effectively reduce the swine and poultry production time by half, double annual production, and strengthen annual production in the private sector.

Project Purpose

The purpose of the grant is to support IFDC to conduct, on behalf of GOR, an emergency relief program for nascent private sector swine and poultry farmers. The salient feature of the project is a large quantity of protein-based feed supplement from the United States. The imported protein supplement would be used in an environmentally responsible manner and would introduce Romanian farmers to free-market principles through public auctions. Sale proceeds would be deposited in a separate GOR account and used by USAID

and the GOR to support the national cadastral survey. In that regard, IFDC assistance would be provided for 18 months (later extended to 23 months) in the areas of programming, public administration, evaluation, and reporting the requirements for a cadastre. In the context of these various interrelated activities, privatization and management of animal waste will also be addressed.

IFDC organized a program to (1) supply protein-based feed supplement and contribute to the development of animal producers in the private sector, (2) introduce a free-market experience for the animal producers and the country at large through public auctions of the feed supplement, (3) develop a marketing plan to privatize the animal feed industry and other agri-inputs, (4) develop a plan in cooperation with the GOR for the environmentally-sound treatment of animal waste, and (5) use the funds from the auctions to support a cadastral survey to accelerate the distribution of land to private owners in Romania. The program would provide between 18,000-25,000 mt of animal feed supplement in two shipments. The quantity would depend entirely upon the prices paid for the commodity and the cost of shipping. Procurement of the commodity and shipping costs were funded by USAID under a separate grant to IFDC. Eventually only about 17,000 mt of feed supplement was actually purchased and shipped to Romania because of grant budget limitations.

A National Cadastre

Technical assistance will be provided to the Directorate of the Cadastre during the course of the grant project by IFDC. The areas to be addressed would include: (1) assistance to a cadastre survey group to develop a plan for programming and budgeting considering the issues of fiscal reform and taxation; (2) defining and describing the current public administration within certain units of the Ministry of Agriculture and Food (MAA) and the Ministry of Finance (MOF) for management of the funds from sales of the imported animal feed supplement. This will include a review of the procedures for budgeting, accounting, procurement, inventory control, monitoring, and auditing used by the GOR for the cadastral survey. A determination will be made as to whether the procedures in these areas in the MAA and MOF meet the requirements of USAID.

If any of the procedures and controls are found to be inadequate, IFDC would make recommendations for changes that would make the procedures and controls comply with USAID requirements; (3) assistance in developing a reporting and evaluation procedure for the Directorate of the Cadastre that will inform USAID about the progress of the cadastral survey.

Project Activities

To manage the importation of the feed supplement, conduct the auctions and dealer development activities, monitor the performance of the feed supplement, and assist the GOR, IFDC requested a Grant of \$2,505,100 from USAID to support expert personnel, management expertise, and training during an 18-month period. The general areas of work included: (1) the importation of protein-based animal feed supplement that will represent emergency relief to private sector swine and poultry producers; (2) the introduction of a high profile free market experience for the Romanian economy that would assist and encourage a transition from state monopoly to private sector ownership in the animal production sector; (3) the development of a marketing plan for feed supplements and other agricultural inputs; (4) the assessment of the procedures for environmental management of farm livestock wastes produced by the animal production sector and development of recommendations to the GOR for improvement; and (5) assistance with the programming, public administration, evaluation and reporting requirements of the accelerated cadastral survey to return land to private ownership.

Terms of Reference

1. The primary task of IFDC in this project was to provide emergency relief to the Romanian private sector swine and poultry producers through the importation of approximately 17,000 mt of protein-based animal feed supplement. An additional task was to assist the Romanian Government in the privatization of the animal production by providing private producers access to improved feed. The terms of reference required IFDC to:
 - a. Verify acceptability by the Romanian farmer of a universal supplement specification that will decrease significantly the time required for the development of swine from birth to market size (100 kg).

- b. Issue the invitations for bids to acquire the feed supplement in the United States and select the successful bidder in accordance with USAID Commodity Importation Regulations while working closely with the USAID Office of Procurement.
 - c. Arrange to ship the feed supplement to Romania and coordinate the unloading at the Port of Constanta.
 - d. Coordinate the logistics for farmers' transport so as to deliver the material to successful bidders at the port or arrange for temporary storage in the port.
 - e. Provide technical advice to Romanian farmers on the recommended use of the supplement and monitor the results.
2. Promote the development of a free market economy in the Romanian animal production sector as it changes from state ownership to private ownership. The transition will be supported in part through the experience of public auctions and an example of competition in the allocation of animal feed supplement. In this work, IFDC was expected to:
- a. Develop and implement a screening process to ensure that the emergency commodity importation program benefits private sector farmers and excludes state-owned farms and enterprises.
 - b. Design, organize, and conduct a series of public auctions using sealed bid tenders to allocate the imported feed supplement among the buyers and to provide information regarding the process of price discovery (determination of the free market price for the feed supplement).
 - c. Ensure that full payment by each of the winning bidders in each auction is deposited in an interest-bearing Separate Account established by the GOR at the Central Agricultural Bank S.A. (Account No. 64260160) for purposes of The Cadastral Program No. 180-0048.
 - d. Design and implement a media campaign to promote the idea of free market economics and publicize the auctions and training seminars.
 - e. Develop and conduct a series of technical training seminars to teach Romanian animal producers about the proper use of feed supplement.
 - f. Develop and implement a technical monitoring program to assess and document the benefits of using the feed supplement.
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- g. Develop and implement a system to monitor the product from the arrival at the port to the end user, and to the extent possible, help to ensure that the product is not exported from Romania or "leaked" into the state-owned farm sector.
 - h. Develop and implement a documentation and analytical procedure for evaluating the price discovery experience including the self-selection process of determining bidders, the evolution of bidding strategy throughout the bidding process, the personal and business profile of successful bidders, the relationship between existing market and bid prices, and other objectives that will assist in evaluating the procedure and design of a future strategy.
3. Develop a marketing plan for feed supplements and other agricultural inputs. The task of IFDC in this area was to assist the GOR in enhancing agricultural sector development in the provision of feed supplement and related agricultural inputs through improvements in domestic production, importation, and marketing through the implementation of open market policies that incorporate private-sector participation and resources. Under this activity, IFDC was expected to:
- a. Assess, design, and promote responsive and cost effective agri-input supply and distribution systems with interventions that focus on private open-market economics that assure competition.
 - b. Provide advisory services to the Romanian Government and the private sector through the recommendation of policies that will promote the development of an open-market economy.
 - c. Provide the services of qualified expert advisors in the private marketing of agri-inputs.
 - d. Develop recommendations and plans for the privatization of the state-owned feed supply structure and provide assistance in the development of a plan for the development of privately operated farm service centers.
 - e. Assist private companies that would have interest in testing the Romanian market for importation of feed supplement by providing technical assistance for commercial import and auction of the imported product.
4. Assess the systems for the management of wastes from animal production and develop recommendations for the GOR for improvement. This activity required an assessment

of existing environmental management of wastes from large swine and poultry operations. In support of this activity, IFDC agreed to:

- a. Perform a preliminary assessment of the present magnitude of the waste management problem and define the practices that are used currently by the industry.
 - b. Develop a waste management plan and recommendations that will eventually allow the Romanian animal production sector to adhere to the standards of the European Union (EU).
 - c. Advise the GOR on the implementation of the plan recommended for waste management.
5. Assist the Directorate of the Cadastre in the Ministry of Agriculture and Food in the cadastral survey to accelerate the distribution of land to private owners. IFDC was expected to:
- a. Provide advice on policy issues in using the funds, including issues of privatization of the cadastre work, fiscal reform, and taxation for fiscal years 1993 and 1994.
 - b. Clarify and describe the procedures and processes of budgeting, accounting, procurement, inventory control, monitoring, and auditing within the Ministry of Agriculture and Food for materials to be procured in support of the cadastral survey. Recommendations would be made for improvements to make them acceptable to USAID for the control of local currency generated from the grant.
 - c. Develop a reporting and evaluation procedure for the Directorate of the Cadastral Survey for keeping USAID informed fully about the progress of the cadastral survey.

The Production of Swine and Poultry in Romania

Estimates of National Stock

In a report, Romania Commodities Import Program, Report No. 1, to USAID in October of 1992, IFDC documented the existence of 78 swine production units with production greater than 5,000 animals per year, 70 layer operations, and 60 broiler

operations that had been incorporated and registered as private sector companies. In addition to the large private production units, there are many large state-owned production units. Although there are also many smaller private production operations, a large portion of Romanian swine and poultry production is from these large farms. The swine herd in Romania was reported at 10,954,000 in 1992 with 5,499,000 on state farms, 1,791,000 in large private farms, and 3,664,000 in small family farms. The swine herd decreased from the 11,671,000 reported in 1989. Total poultry reported in 1992 was 106,745,000, which included 53,809,000 on state farms, 9,261,000 on large private farms, and 43,675,000 on small family farms. The poultry flock decreased from the 113,968,000 reported in 1989.

The MAA estimates that there are about 2.5 million family farms raising swine but holdings are small, the majority with less than 10 animals. Family farms account for about 3.7 million swine or about 34% of the national total. Over 600 family farms have herds of between 50 and 100 animals and 15 have herds ranging from 100 to 500. In addition to these swine farms, there are an additional 130 commercial societies (CS/31) poultry farms with layer or broiler production.

Animal production on CS/31 farms is declining and, according to MAA, national pork production decreased by 25% between January 1991 and July 1992. During this period production by state farms decreased by 15% and private farms produced only 51% of that in the previous year. This shows a serious deterioration of private farms compared to state farms at a time when it is expected that a transition be made from government-controlled production to private production. A similar problem is also evident in poultry production where in 1992 state farms produced 76% of 1991 production and private farms 56%. Poor profitability due to lack of protein for feed is a direct threat to private farms. GOR cannot absorb their losses during adverse economic times or offer refinancing in the case of bankruptcy.

Geographic Distribution of Swine Production

The majority of swine production by the private sector is concentrated in a few regions with approximately 80% in 17 districts in the east, southeast, and south of the country. About 70% of swine farms owned by commercial societies are located in these areas. Swine production in mountainous areas is limited to small farms.

Figure 2 shows the number of private swine farms and production by district in January 1992, as reported by MAA. Small farms with 1-10 hogs for home consumption and state farms are not shown. The concentration for potential production follows the southern border commencing in the districts of Tulcea and Braila and moves West to Dolj and then North to Arad with the concentration of farms following the Danube River. Total production capacity amounts to 2.987 million hogs per year. The district of Maramures has only one farm with a production capacity of 48,000 swine. Other districts with large production of swine at a single location include Sibiu 45,000, Gorj 44,000, and Botosani 35,000. There were six districts with no swine farms on January 1, 1992, and eight with only one farm. The two districts with the largest facilities are Teleorman with 223,000 and Constanta with 202,000. The number of hogs on January 1, 1992, was about 1.8 million on the private collective farms which represents about 56% of capacity. Traditionally, about 25% of the total swine population is slaughtered for the holiday season each year with most processing in the month of December.

Organization of Seminars and Auctions

Media Publicity

As required by the terms of reference, a media campaign was organized to inform the Romanian public about pre-auction seminars and the feed supplement auctions per se. The effort was broad and included announcements through posters, newspapers, radio, television, and letters to various organizations. Quite naturally, announcements through these media led to people learning about the effort through friends, banking officials, and the MAA. As shown in Table 1, the most frequently cited sources of information were television (53%), followed by MAA (35%), radio (27%), posters (26%), newspapers (26%), IFDC letters (10%), friends (7%), banks (7%), and other (1%). Many respondents cited more than one source.

The most successful methods were the television advertisements and a program "Viata Satului" or "Village Life." This national television program covers rural development issues and provided information about the auction to about 55% of the farmers. The MAA was also helpful in disseminating information to the farmers; about 37% of the participants

learned about the auctions from this source. Slightly over one-fourth of the participants learned of the auctions and seminars from posters, newspapers, and radio. An interesting observation is the overall increasing importance of the MAA and banks in providing information about the auctions.

Pre-Auction Seminars

Seminar presentations explained the auction program and the procedures to purchase the feed supplement. The attributes of the feed supplement were also explained. The sales required sealed bids and participants could offer multiple bids. The feed supplement was offered in 10-mt lots with a maximum purchase of 50 lots (500 mt) by a single purchaser and the minimum purchase was 1 lot (10 mt). Funds from successful bidders were transferred using bank letters of guarantee. Auction participants were allowed to bid only in the amount shown in the bank guarantee. Farmers who intended to purchase 1 lot were not required to have a bank letter of guarantee but were required to deposit the amount bid into the special account within 14 days of the date of the auction. Most of the transfers were completed within 7 days from the date of transfer.

In the second pre-auction seminar the participants were informed that the minimum purchase was reduced to 5 mt and the maximum purchase was reduced to 300 mt. An information package was given to all participants in the seminars, which contained presentation outlines, tables, and figures used in the presentations. All presentations were given in the Romanian language. Questions by the participants were answered through an interpreter. Training was given about the composition of the poultry supplement and blending in the second seminar.

Participation in the Pre-Auction Seminars

Between May 17 and September 2, 1993, 13 pre-auction seminars were held in 9 districts of Romania. As shown in Table 2, these seminars were attended by 743 persons, 525 of whom were farmers and 218 as observers. Thus, the seminars served to inform potential purchasers about auction procedures and provided an opportunity to the general public to be introduced to basic market economics.

The participants in the pre-auction seminars were informed that purchases of the feed supplement would be limited to the following types of private enterprises:

1. Commercial Societies registered under law CS 31/1990. These companies were required to present registration papers and the contracts of their companies showing ownership.
2. Agricultural Associations registered under law 36/1991. These associations were also required to present registration documents and the contracts of the association which indicated the entities that were members.
3. Nonjuridical Associations which were informally organized without registration. These groups were required to present a letter signed by the mayor of their village indicating that they were private farmers and denoting the number of animals owned.
4. Individuals were required to present identification and a letter from the mayor of their village indicating that they were a private farmer.

The participation of representatives from these types of farms in the pre-auction seminars is shown in Table 3. Individuals (40%) and commercial societies (39% comprised a majority of the participants. However, on a percentage basis participation in the second seminar by individuals decreased dramatically (24%) and that of commercial societies increased greatly (61%).

Profile Participants in the First Series of Auctions

Registered attendance at the seminars totaled 636 persons including farmers, bankers, reporters, MAA personnel, and other governmental officials. Farmers accounted for 431 or 68% of the seminar participants. Table 3 lists seminar attendance by type of farm. All farmers were asked to complete a general questionnaire regarding their farms and production performance. The farmers returned 281 questionnaires for a return rate of 66% at the seminars. Participants in the auctions, who did not attend the seminar or return a questionnaire, were given another opportunity to complete a questionnaire at the auctions.

As a result, a total of 301 questionnaires were collected to be used as a basis for a profile and description of Romanian farms.

Farmers attending the seminars represented 40 of 41 districts in Romania. Four types of private farms were identified as eligible participants in the auctions. The classifications include individuals or sole proprietors, farmer associations, commercial societies established under law 31 of 1990, and agricultural companies privatized under law 36 of 1991. Individual owners of private farms comprised the largest group (43%) of participants. When combined with the commercial societies, 75% of the farms were represented by the two categories. Type of farm ownership was verified by Coopers and Lybrand after reviewing farm documents. Over 83% of the bidders were classified as commercial societies. The commercial societies purchased about 99% of the feed supplement at the auctions.

Of the 301 farmers attending the seminars and auctions that returned completed questionnaires, 61% reported using protein supplement. Among the auction winners 85% reported using protein supplement. Thus, 15% of the winning farmers were first-time users of a protein supplement. The most common types of protein supplement used are sunflower meal, soybean meal, and animal protein. The seminar respondents reported over 40% had used one of the three common protein supplements. Among auction winners over 60% used one of the three supplements with over 70% having used sunflower meal. Several respondents added a supplement category including residue from brewing.

The seminars were well attended by representatives of all farm sizes, but when the auction winners are compared to all participants, one can see that a significant portion of the small farmers did not participate successfully in the auctions even though 29 buyers purchased only one lot. Because the program was designed for commercial animal producers, this result is not surprising. Nevertheless, small-scale private producers did not benefit from the effort.

One question that the farmers were asked involved ranking in order of importance the factors most limiting livestock and crop production. For livestock production the availability of feed and access to credit were the greatest limiting factors followed by the lack of quality housing and equipment. In the production of crops, the factors most limiting production

were credit availability and the lack of quality machinery; the availability of land and an adequate supply of fertilizer were secondary limiting factors.

Finally, the issue of credit for private farmers proved extremely important. Banca Agricola provides the vast majority of financing for the farms in Romania. At various times the GOR issued special credit for private farmers at an interest rate of 15%. Nearly 50% of the loans made at the low interest rate were in the range of 10 million to 50 million lei, representing the large clients of the bank rather than individual private farmers. The animal feed supplement program did not include a credit component.

Proceedings of the First Series of Auctions

The first auction was scheduled to precede the arrival of the first importation of feed supplement. Auctions were scheduled to begin in Giurgiu on June 18, 1993, and to continue in seven locations until June 29, 1993. The auction schedule is given in **Table 4**. Unlike the seminars, the auctions were held on consecutive days to allow clear determination of the results and to monitor the number of farmers who participated in more than one auction.

A total of 10,220 mt of feed supplement was auctioned in the eight locations. A reserve of 380 mt was withheld pending unloading of the cargo. After the ship was unloaded, it appeared that only 240 mt remained. IFDC had hired Control Union, a certified marine surveyor, to verify quantity and quality of the cargo. Their report showed that the cargo was short-loaded by 4,878 bags or 122 mt. The losses at the port were 18 bags or 0.0043% and the total landed cost for the first shipment of swine feed supplement was US \$457/mt.

The auctions began with registration at 8:30 a.m. In all cases, some farmers arrived up to 1½ hours early to participate in the auction. The farmers were received by IFDC staff and directed to a registration table where attendance was logged and they received a registration form. From the first table the farmers were required to pass several other locations to check their organizational and financial documents. Representatives of Coopers and Lybrand verified that the documentation showed that the participant indeed represented a private farm or company. The third step in the registration process was to obtain certification of the bank guarantee by a representative of the Banca Agricola. After clearing the auditors and the bank representatives, the potential bidder received the bid documents and submitted a

signed contract, that is an invitation to bid. The contract explained the auction procedure and contained agreements by the bidder to participate in the monitoring procedure following the auction and not to sell the feed supplement.

After all farmers were registered, two auctions were held: one at 10:00 a.m. and a second at 12:00 noon with one-half of the feed supplement being sold at each auction. Farmers who were late for registration in the first auction were allowed to register and, if qualified, were allowed to participate in the second. Also, any potential participant who was in the process of registering at the time of the scheduled bid opening was allowed to finish the registration and submit a sealed bid tender for that auction. The two-auction procedure gave farmers who were unfamiliar with the sealed bid auction process a second opportunity to be successful and also allowed the bidding strategy to be changed between the two sessions. In one instance at Braila, this procedure resulted in the attempt by 10 bidders to fix the auction price during the second bidding session, which resulted in the decrease of the 2,000-mt offering to 1,420 mt.

It is interesting to note that many of the seminar participants and several members of the Romanian Parliament voiced reservations that this program would neither reach nor help private smallholders; 29 of the 78 successful bidders purchased only 1 lot (10 mt). This represents about 38% of the successful bidders in the auctions and is a clear indication that the smallholders were able to compete in the auction process. During the seminars, smallholders were encouraged to form groups to purchase the feed supplement.

More than 22,000 mt was demanded in the initial bids at the eight locations. This response shows a viable Romanian market among private farmers for protein feed supplement at or near world market prices. Sales in this series of auctions were limited to private-sector farms and purchases were limited to a maximum of 500 mt and a minimum of 10 mt per buyer, which could have further reduced the demand from both small and large farmers. As required by the terms of reference, a summary of the types of farms that purchased swine feed-supplement in auction 1 and prices paid is shown in Table 5. The data show that virtually all of the swine feed (99%) was purchased by commercial societies (CS/31).

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As required by the terms of reference, the quantities and prices of swine feed supplement purchased by district are shown in Table 6. A total of 77 buyers representing 31 districts of Romania purchased swine feed supplement in the first auction where 10,220 mt of supplement was sold. In round figures, the average purchase price was US \$309/mt with the price range of between US \$215/mt and US \$449/mt. It is important to note that these prices are very comparable to world market prices and represent an excellent introduction of market economics in Romania. The landed cost of US \$457/mt is not typical. The grant required that the feed supplement be transported by a U.S. flagship which resulted in the cost being as much as 50% higher than with a non-U.S. flag carrier.

After completion of the auction and confirmation of the deposit of funds into the MAA account, the supplement was released to the buyers at the port of Constanta. As mentioned earlier, all buyers, except those who purchased only 1 lot, were required to have a bank letter of guarantee to cover the amount that they intended to bid. The two representatives from the Banca Agricola arranged for the transfers of funds from the branch banks at each auction site and the procedure worked well.

Port Operations During the First Shipment of Feed Supplement

IFDC established offices in Constanta and retained the company Larex International to perform the sampling and analysis of the cargo. Tomis Ship Agency was hired to assist with obtaining an importation permit and with the scheduling the trucks and railcars of buyers for the transportation of the supplement. All transport was paid by the buyers. Of the 240 mt of feed remaining after the auction, 150 mt was disposed of in Constanta and the remaining 90 mt was shipped by rail to Curtea de Arges to be sold at the farmers' fair between August 11-16, 1993.

The feed supplement arrived in Constanta on June 25, 1993, and four auctions remained to be completed after arrival. It was necessary to schedule the auction dates prior to the commencement of the seminars, thus, it was also necessary to predict the arrival date of the ship. The early arrival of the ship resulted in the initial discharge of cargo being stored in warehouses while waiting for the first bank transfers to be completed and for the arrival of buyers and trucks. This posed no major problem because only 2,600 mt was transferred to the warehouse during unloading and was transferred during the first 6 days

of unloading. After the sixth day, all the cargo was loaded directly in trucks or railcars. The ship was in the port for a total of 15 days and all of the supplement was unloaded during that period. An additional 15 days was required to dispose of the 2,600 mt of supplement from the warehouse.

The official tally prepared by Control Union showed that the cargo was short loaded by 4,878 bags or 122 mt. Of the cargo received, 740 bags or 18.5 mt were received in poor condition – wet, oily, torn, or spilled. This supplement remained in the warehouse at the end of operations to be recovered or disposed of by the agents of the shipowner. Of the 740 bags, 183 bags or 4.6 mt were rebagged aboard the vessel and fully recovered; 21 bags or 0.5 mt were disposed of as floor sweeping of no value. The remainder was not accounted for. The 4,878 bags or 122 mt that were reported as short loaded were claimed by IFDC and settled with the shipowners at a value of cost plus freight of about US \$51,000.

The project staff at Constanta managed the shipment of feed supplement, which was loaded on trucks and rail wagons or stored in a warehouse. During the time the ship was being unloaded, there was at least one IFDC Headquarters staff person on duty at the port 24 h/day. A separate loading tally was kept for each buyer showing the quantity received and the amount remaining to be delivered. Daily discharge logs summarizing the activities at the port and the warehouse were published by the Constanta office. The staff from Constanta also managed the inventory and loading of the supplement at the farmers' fair in Curtea de Arges.

Monitoring of the First Shipment of Feed Supplement

During the period immediately following the last auction, the first 3 weeks in July, all of the buyers were visited by the monitoring staff. These initial visits were to locate the farms, enable the buyers to become acquainted with the program and staff, and arrange for the selection and tagging of animals for monitoring. All 77 buyers were visited. Many of the buyers stated that their swine had improved quickly during the first 2 weeks of supplement use. The major improvement was a decrease in the incidence of diarrhea mortality among weaned pigs.

The monitoring revealed that the feed supplement purchased by five buyers from the village of Casvana (50 mt) may have been resold to a state farm in the area. Subsequent monitoring visits to Casvana and the state farm in question confirmed that 20 mt of feed was, indeed, purchased by a state farm. The mayor of Casvana signed and stamped letters for the five purchasers (10 mt each) without letters of guarantee. Each of the letters signed by the mayor stated that these buyers were private farmers owning 150 head of swine each.

Subsequent monitoring revealed that the five buyers were students, and although all were private farmers, none had more than 10 pigs. When questioned, the mayor stated that he was also aware the letters contained misstatements of the number of animals each person had reported.

Only three of the buyers were in the village on the day of the visit so the other two were not contacted. A request was made through the mayor for a list from each of these buyers of quantity sold and to whom. It was agreed that the list would be available on the next monitoring visit. It was also explained to each of these buyers that they will not be allowed to participate in future auctions.

Allowing purchases of 1 lot without letters of guarantee resulted in speculation. To prevent this in the future, all bidders were required to have bank letters of guarantee for purchases during the second round of auctions. As an accommodation for smallholders, the minimum purchase for the second auction was decreased to 5 mt but required a letter of guarantee.

Profile of Participants in the Second Series of Auctions

Registered attendance at the seminars totaled 107 persons including farmers, bankers, reporters, MAA personnel, and other governmental officials. Farmers accounted for 94 or 88% of the participants. Table 7 shows the locations and dates of the second auction. As in the first auction, all participants were asked to complete a general questionnaire about their farms and animal production.

Bidders who did not attend the seminar or had not returned a questionnaire were given an opportunity to complete the questionnaire at the auctions. As a result,

79 questionnaires were completed and used as the basis for a profile and description of Romanian farms. Farmers attending the seminars represented 29 of the 41 districts in Romania.

Most of the 79 farmers attending the seminars and auctions that returned completed questionnaires had experience using protein supplement. The most common types of protein supplement used were soybean meal, sunflower meal, and animal protein. Over 93.0% of the seminar respondents had used one of the three common protein supplements. Several respondents added a supplement category including leftovers from the brewing process as a source of protein. Nearly 9.0% of the seminar participants had not used a protein supplement in the past year. Nutricomb, the state feed manufacturing company, has been the primary source for purchasing feed supplement. IFDC ranked second as a supplier of supplement. The third and fourth most common sources were direct purchase from oil seed processing plants and direct import of supplement.

The seminars were well attended by representatives of all farm sizes, but when the auction winners are compared to the total distribution, one can see that most of the small farmers did not successfully participate in the auctions. Only four buyers purchased half lots (two for swine and two for poultry). Since the program was designed for commercial animal producers, this result is not surprising, and in fact, most of the supplement was purchased by societies formed under Law 31.

Farmers were asked to rank in order of importance the factors most limiting livestock and crop production. For livestock production, the availability of feed and access to credit were ranked as the greatest limiting factors followed by the lack of quality housing and equipment. For crop production, the factors most limiting production were credit availability and the lack of quality machinery; the availability of land and an adequate supply of fertilizer were secondary limiting factors. The farmers were also asked from which source they most often receive information regarding new agricultural technology. The primary source was magazine articles. The MAA, radio, and newspapers played secondary roles in information dissemination.

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The availability of credit for private farmers is extremely important. Banca Agricola provides the vast majority of credit for farmers. At various times the Government of Romania has issued special credit for private farmers at an interest rate of 15%. Most of the loans made at this low interest rate were in the range of 10 million to 50 million lei, indicating that recipients were large clients of the bank rather than individual private farmers. The design of the USAID-IFDC program did not include a credit component. Repeated requests were made to the Minister of Agriculture, the Banca Agricola, and the World Bank representative to make credit available to private farmers, but to date, no new credit programs have been created.

Seminar Procedures

Seminar presentations were designed to explain the auction program and the procedures to sell the feed supplement. The sales were organized as sealed bid tenders and participants were allowed to present multiple bids. The feed supplement was offered in 10-mt lots with a minimum purchase of 5 mt and a maximum of 30 lots (300 mt) to any single purchaser. Both the minimum and maximum purchases were reduced from the first shipment as a result of the relatively small quantity being imported. Funds from successful bidders were transferred using bank letters of guarantee. Auction participants were allowed to bid only to the amount of their bank guarantees; the one exception was that farmers who intended to bid for only 5 mt were not required to have a bank letter of guarantee but were required to deposit the amount bid into the special account on the date of the auction. Most of the transfers were completed within 7 days from the date the transfer was initiated. Other changes in the banking procedures included accepting certified checks as payment. In one case where a buyer could not obtain a letter of guarantee, a deposit slip for the funds was accepted on the day of the auction. Funds were deposited into the special account (No. 64.26.01.60) in the Banca Agricola. Funds from this account are to be used to purchase equipment and supplies required for the cadastral survey.

Proceedings of Second Series of Auctions

The auctions of swine and poultry feed supplement were preceded the arrival of the second cargo. Auctions began at Cluj-Napoca on September 28, 1993, and continued at three locations until completion on October 7, 1993. The auctions were held over a 2-week period

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to allow the participants to bid in multiple auctions. The locations and dates of the second auction are shown in Table 7.

The auctions were organized with farmer registration starting at 8:30 a.m. At all locations, some farmers arrived up to 2 hours early to participate in the auction. The procedures used at the auctions were identical to those used during the first series with the one exception that swine and poultry supplement were offered simultaneously. The farmers were received by the project staff and directed to a registration table where their entry was logged and a registration form issued. From the first table the farmers were required to pass several other points to check their organizational and financial documents. Representatives of Coopers and Lybrand were charged with verifying that the documentation of the participant indicated representation of a private farm or company. The third point in the registration process was to obtain certification of the bank guarantee document by the representative of the Banca Agricola. After clearing the auditors and the bank representatives, the potential bidder received the bid documents (separate documents were available for swine supplement and poultry supplement and bidders could take either or both) and submitted on signed contract that is an invitation to bid. The contract covered the auction procedure, the agreement of the bidder to participate in the monitoring procedure following the auctions, and an agreement not to offer the feed supplement for resale.

After all farmers were registered, both the poultry and swine supplement bid boxes were opened at 10:00 a.m. However, as in the first round of auctions, any person who was in the process of registering at the time of the scheduled bid opening was allowed to finish the registration and submit a sealed bid tender for that auction. The elimination of the two-auction procedure used in the first auction was justified because most participants were familiar with procedures and able to define a bidding strategy at one auction. As a result of this change, there was an increase in the percentage of buyers that participated in multiple locations. For example, half of the participants at the Cluj auction had attended previous auctions for example. This strategy could have been the result of a combination of the removal of the second opportunity to bid at each location and the increased demand indicated by the increased number of bidders at each location. During the first series of auctions, an average of 13 bidders (104 total) participated at a location. This number increased to 36 (146 total) during the second series of auctions. There were 54 unique

winners during the four auctions. This compares with 77 unique¹ winners in the first auction. Of these 54, there were 7 new winners for swine supplement and 12 new winners for poultry supplement, that is farmers who were not in the first group of 77.

Swine Feed Supplement

As shown in Table 8, about 90% of the swine feed supplement in the second auction was purchased by commercial societies, 9% by agricultural companies, and only about 1% by individual farmers. In round figures the mean price paid for the supplement was US \$492 with a range of between US \$343 and US \$780. The greatest range in prices was paid by commercial societies (US \$343-\$780), which is evidence of an authentic and enthusiastic interest in the product.

As required by the Terms of Reference, the data in Table 9 show quantities and prices paid for swine feed supplement by district. The districts of Constanta, Cluj, Vrancea, Tulcea, Prahova, Mures, Iasi, Braila, and Bucharest accounted for about 80% of the total supplement purchased. The average price paid was about US \$492 and ranged from US \$353 to US \$802 in round figures. A total of 34 purchasers from 18 districts of Romania made swine feed purchases in the second auction.

Poultry Feed Supplement

As shown in Table 10, the purchase of poultry feed supplement in the second auction was dominated by commercial societies who purchased 99% of the product. Individuals and nonjudicial associations made no purchases. Agricultural companies paid an average of US \$588/mt compared to US \$482 by commercial societies or about 18% less than agricultural associations. Prices paid ranged from US \$365 to US \$675, in round figures.

The quantities purchased and mean prices paid for poultry feed supplement by district are shown in Table 11. These data show that 27 buyers from 17 districts purchased 2,400 mt of supplement at an average price of US \$484/mt. The prices paid per metric ton ranged from US \$376 to US \$662 in round figures. About 63% of the supplement was purchased

¹"Unique buyers" refers to the total number of individuals who purchased animal feed supplement. These unique buyers may have made a single purchase of one type of supplement or may have made multiple purchases of one or both supplements.

by 4 of the 17 districts represented in the auction. Again, the prices paid for the supplement in the second auction met or exceeded international market prices.

It is difficult to estimate what the total demand and price may have been if there were a greater quantity available. Because there were numerous bidders that participated in several auctions, it is difficult to use the amount bid as an indicator of demand. The amount of bank guarantees presented at each auction is an indicator of the amount farmers were prepared to pay and can be understood as an indicator of demand. The total value of all letters of guarantee which were presented at the auctions show that twice the quantity of feed purchased could have been sold. As in the first auctions, participation was limited to private sector farms and purchases were limited to a maximum of 300 mt per buyer and a minimum of 5 mt. These restrictions could have reduced further participation by both small and large farmers. The demand in the state sector is not reflected here. Finally, all new purchasers were added to the monitoring schedule and were visited just as the buyers from the first auction.

Port Operations During the Second Shipment of Feed Supplement

The cargo was released to buyers at the port of Constanta after confirmation of the deposit of funds into the MAA account at Banca Agricola. As mentioned earlier, all buyers were required to have a bank letter of guarantee, a certified check, or cash to cover the amount that they intended to bid. A representative from the Banca Agricola arranged for the transfers of funds from the branch banks at each auction site. As in auction 1, the procedure for bank transfers worked well. The flow of paperwork and information for the transfer of auction proceeds into the MAA special account was the same as the first auction with the exception that the representative of the Banca Agricola tracked deposits into the account and provided information daily.

Project offices were re-established in Constanta and Larex International was again retained for sampling and analysis of the cargo. Tomis Ship Agency was also retained to assist in port formalities and with the scheduling of trucks and railcars for transportation. All transport costs were paid by the buyers. The agent of the shipowner was Levant Shipping and Phoenix again provided stevedoring services.

The shipment of feed supplement for auction 2 arrived in Constanta on October 15, 1993. The last of the series of four auctions was completed on October 7, 1993, which left about 1 week to schedule delivery to buyers. Unloading began at 8:00 p.m. on October 15, 1993, and was completed on November 8, 1993. During that time 1,247 mt of feed supplement was stored temporarily in warehouses.

The port operation proceeded well with excellent relations between the ship agents and the project staff. The official tally was prepared by the Control Union and agreed with the tally company retained by the owner, ROMCONTROL. The total cargo received was 6,451.3 mt (3,996.96 swine supplement and 2,454.31 poultry supplement) with 18.7 mt or 0.29% less than that reportedly loaded. The total quantity delivered in Constanta was 6,446.6 mt with overall losses amounting to 23.5 mt (0.36%), of which 4.8 mt was lost in handling. The warehouse work continued between October 15 through November 6, 1993. A followup survey of purchases confirmed that port operations went smoothly.

The feed supplement was loaded onto trucks and rail wagons or stored in a warehouse. When the ship was being unloaded, there was at least one representative of IFDC on duty at the port 24 h/day. A separate loading tally was kept for each buyer showing the quantity received and the remainder to be delivered. Daily discharge logs summarizing the activities at the port and warehouse were published by the Constanta office. The total landed cost for the swine and poultry feed supplement in the second shipment was US \$608.27/mt. This cost was more expensive than the first shipment because the soybean meal increased from US \$319.75/mt to US \$383.53/mt and because of the smaller quantity of the second shipment, freight costs increased from US \$137.11/mt to US \$224.64/mt.

Price Discovery in the June 1993 Auctions²

The seminars and auctions, in addition to providing the means for distributing the feed supplement and instructing farmers on use, also served as a means of price discovery. In this section the results from the June auction and price discovery are discussed. Price discovery from the September-October auctions, comparisons between the two auctions periods, and

²Price discovery refers to the process of determining free market prices.

an examination of the relationship of market factors with the average award price are also presented.

Auction Prices

Measures of auction prices included: maximum award price, average award price, market clearing price, average bid price, and the minimum bid price. Each price contributes to a better understanding of bidder behavior and together give an indication of the efficiency of price discovery. Figure 3 shows the relative position of these five prices for the 10:00 a.m. auction results in Giurgiu. The five auction award prices for each of the auctions of June 16 at the eight locations are shown in Table 12.

The maximum award price was the highest price tendered in each auction. As shown in Figure 3 and Table 12, at the 10:00 a.m. auction in Giurgiu the maximum award price was 211 lei/kg. The average award price was the weighted average price of all winning bids, determined by weighting each bid price by the bid quantity. The average award price incorporates the full distribution of winning bids and was the most meaningful measure of the auction price (Table 12 and Figure 3). The market clearing price was the price at the point where supply and demand were equated and all bid prices equal to this price and greater were awarded the quantity bid. This price was readily observable by all bidders and understood as the minimum price needed to purchase feed supplement.

The average bid price was determined by weighting each bid price by the respective bid quantity. The average bid price incorporated the full distribution of winning and losing bids. The minimum bid price was the lowest bid price submitted at each auction. In many cases the minimum bid price was just above the floor price of 157 lei/kg.

With some minor exceptions, all prices were higher at the twelve noon auctions than at the 10:00 a.m. auctions, and higher at later auctions compared to earlier ones. The higher prices at the noon auctions represented a better understanding of prevailing prices as learned from the 10:00 a.m. auction and the high level of unsatisfied demand by farmers trying to buy a fixed quantity of supplement.

In only two situations were the noon prices lower than those at 10:00 a.m., Craiova and Braila. In these two auctions irregularities were responsible. In Craiova, demand was low relative to supply, and in Braila, collusion was discovered in the noon auction and several bids were disallowed. In most auctions, the average award price ranged from 5% to 15% above the market clearing price, which shows a fairly tight distribution of winning bids and reasonably accurate price discovery for most of the bidders.

Supply and Demand

The quantity of supplement offered at each auction was determined by the concentration of private swine farms in each auction region and by estimated demand for supplement revealed by the farmers on the seminar questionnaires. The quantity of feed supplement offered for sale at each auction by date and time is shown in the supply column of Table 13.

Demand represents the total quantity bid at each auction. The total demand, at each site and for all of the June auctions, represented the total demand, excluding repetitious unsuccessful bids. The demand and supply ratio was the quantity bid at an auction divided by the quantity of supplement offered. The larger ratios represent more competition and increased rationing.

At each auction, virtually all of the effective demand was expressed at the 10:00 a.m. auction, with the noon auction demand composed almost entirely of rebidding unsuccessful 10:00 bids. With the exception of Craiova and Cluj, there was significant excess demand at each auction.

Price Discovery in the September-October 1993 Auctions

The September-October auctions presented several different situations effecting price discovery. The supply of product was less and divided between swine and poultry feed supplement. The number of sites was reduced from eight to four and single auctions were held at each site. The supply of swine and poultry feed supplement was sold separately but

simultaneously at each site. Finally, with the added experience from the June auctions, there was considerable bidder movement between the auction sites.

Auction Prices

In general, auction prices were higher than those in June, and prices rose rapidly as the auctions proceeded through the four sites (Table 14). The increase in the average award price was a constant 17% for each subsequent auction. The 5%-15% spread between market clearing and average award price continued, indicating that price discovery was orderly within a fairly narrow range. In most cases the minimum bid was significantly above the floor price as all bidders were serious and aware of the quality of the product. The bidders also realized that with the tight supply and strong demand it would not be possible to purchase great quantities at the floor price. In contrast, at the June auctions a number of bidders cast bids at or near the floor price.

Supply and Demand

The higher auction prices and increasing prices as auctions proceeded are reflected in the substantially higher demand-supply ratios during the September-October auctions. The demand at the first auction site (Cluj) of 6,100 mt almost equaled the total supply (6,305 mt) available for the four auctions (Table 15). In the remainder of the auctions, the total demand at each auction exceeded total remaining supply. This was partly because a large number of bidders appeared at the first auction from areas of later auction, partly from the expansion of bidders to include poultry as well as swine operations, and partly from a reduced supply of feed supplement. This presence of a number of bidders at each auction from both previous and future auctions continued throughout the September-October auction. In later auctions, the number of bidders and/or volume of bids declined as more individuals either satisfied their demand or reached ceiling levels (300 mt). This caused the supply/demand ratio to decline from near four at the first auction to under two at the final auction. These ratios were substantially greater than the 1.0 to 2.0 experienced in the June auctions.

This movement of unsuccessful bidders among sequential auctions, especially during the September-October series, had some unanticipated results (Table 16). After the first bidding experience, unsuccessful bidders were informed better about auction clearing prices

and often traveled to the next region to bid aggressively to satisfy demand. As noted in **Table 16**, bidders from each region satisfied a higher quantity of their demand at auctions other than their own regional auction and generally at the succeeding auction. This underscores the importance of prior price information in directing bidders to decisions about prices.

Profile of Participants

Type of Farm Ownership

Private individuals accounted for 120 (42%) of the participants in the seminars that returned questionnaires (**Table 17**). However, individuals accounted for only 13% of all bidders in the auctions due to factors such as minimum lot size, transport problems, credit availability, and realization that the auction was not a philanthropic program. Over three-fourths of the bidders and winners were Commercial Societies formed under Law 31. These farms purchased 89% of the supplement. The predominance of the commercial societies reflects the solid base of the large-scale privatized cooperative farms in the agriculture sector.

Ownership of Animals

Because the auctions involved livestock feed supplement, farm size was calculated in terms of animal units present on each farm. An animal unit equates the total feed consumption of each livestock type with one head of cattle equaling nine hogs and 110 chickens. Twenty-nine percent of the participants had between 1 and 100 swine equivalents on their farm (**Table 18**). This size of farm may have difficulty in using the minimum lot of 10 mt before the supplement deteriorates in quality. It is not surprising that only 2% of the final winners own a small number of animals. In contrast, farms with over 10,000 swine equivalents represented 18% of the participants and 50% of the winners.

Factors Affecting Auction Price Formation

This section focuses on evaluation of the price formation process at the auctions. First, factors influencing auction price levels are identified. Second, the relation of these factors to the average award price are determined by regression analysis. To analyze price discovery at the auctions, an ordinary least squares regression model was used to identify the factors influencing bidding behavior and thus the average award price. The main variables include measures of supply, demand, prior knowledge, inflation, and transport distance.

Dependent Variable Description

The average award price was selected as the dependent variable, the quantity-weighted average bid price of all winning bids. The average award price is superior to the market clearing price because it incorporates the information from the full distribution of winning bids at an auction rather than just the minimum winning bid. In the following analysis, the average award price has the label of AWARDUSD and is measured in U.S. cents per kilogram.

Alternatively, the market clearing price, the price at the point where supply and demand are equated and all bid prices equal to this price and greater were awarded the quantity bid, is another measure of the auction price. This price was readily observable by all bidders but was not considered the best variable to represent the auction price as a dependent variable because it was the minimum observation in the distribution of winning bids. However, because it was readily observable, it is a source of information for bidders at subsequent auctions. Thus, in this analysis it was used as a lagged information variable measured in U.S. cents per kilogram.

Independent Variable Description

Supply -- Supply was expected to have a negative relationship to the average award price due to the presence of rationing via price at the auctions. Two measures exist for analyzing the effect of supply on the average award price, a short run supply and a long run supply. Supply was measured first as the pure short run quantity of supplement offered at a specific auction. The short run supply appears as a vertical supply curve because all of the allocated supplement was sold at each individual auction.

Long run supply, or diminishing total supply, for each auction was measured as the total quantity of supplement (swine supplement at the June auctions, and swine and poultry supplement at the October auctions) less the amount sold at the preceding auction. For example, during the June auction the first observation for long run supply was 10,220 mt and the next observation would be 9,820 mt because 400 mt was sold at the 10:00 a.m. auction at the first site. The long run supply for the October auctions was computed similarly with long run supply of poultry and swine supplement calculated separately. Long run supply was especially important in the October auctions when individual bidders were participating in multiple auctions.

Demand – The alternative measures of demand at the auctions range from the readily observable number of bidders, to the number of bids submitted, and finally the total quantity of demand expressed by the bids. Auction theory predicts a positive relationship between the number of bidders and auction prices. However, endogenous quantity choice in multiple unit auctions may lead to the number of bidders or bids not being the best demand-pull indicator. In this analysis the total quantity demanded was used as the best measure of demand in the auctions.

Prior Knowledge – Information available to the bidder regarding previous market clearing prices, world market supplement prices, the floor price, and alternative commodity prices may influence auction bid prices. New information was available to the farmers after the first auction because all bid prices were displayed publicly with significant emphasis on the market clearing or minimum winning price. To capture the information affects displayed in the previous auction the market clearing price with a one period lag was used as a prior knowledge signal for price information.

The initial auction did not have a lagged price so the estimated import parity price is used as the initial information signal because the farmers were informed of the world market prices for the supplement. The lagged market clearing price is a good measure of prior knowledge because it was widely observable and understood as the minimum price needed to purchase supplement. Prices for substitutes and complements were not readily available due to only a state operated farm input network that did not distribute a comparable substitute and an underdeveloped private farm input supply network.

Inflation – The Romanian economy experienced high inflation during 1993 with an annual rate of 290%. One index of the inflation in Romania is the official exchange rate of lei per US dollar obtained from the National Bank of Romania. The lei per US dollar exchange rate is not a perfect measure of inflation due to the various factors influencing the rate including the demand and supply of lei and US dollars and the relative rates of inflation between the two economies.

The exchange rate can be entered directly into the model as an independent variable, but high correlation exists between the exchange rate and the lagged market clearing price causing collinearity problems. Thus, an alternative method is to convert all prices from lei per kilogram to U.S. cents per kilogram using the official exchange rate on the day of the auction as a deflator. This conversion was made when pooling the June and October auction data.

Transport Distance – All supplement for the auctions was sold on the basis that farmers would take delivery at the port of Constanta. Therefore, bidders needed to account for the cost of transporting the supplement from the port to farms. The measure of distance used for this analysis is the quantity-weighted average distance to the port of all bidders at an auction. The weighted average distance is especially important when a significant number of bidders at a specific auction are from different regions of the country. Distance is expected to have a negative relationship with the average award price.

Intercept and Slope Shifters – A dummy variable, OCTOBER, identifying the June and October auctions, with October equaling one, was used in the analysis to test for an intercept shift between the June and October auctions. Differences in the June and October auctions were expected because of the elapsed time allowed a revision of bidding strategies and an opportunity to gain experience using the supplement. The dummy variable was not significant when tested for an intercept shift.

Interaction terms between the dummy variable and the four independent variables were also tested. The distance and demand coefficients were not significant, but the coefficients of long run supply and prior knowledge variables were significant and were used

in the analysis. The interaction terms were used to test for a change in the slope of long run supply and the prior knowledge variables between the June and October auctions.

The variables used in the model are shown in **Table 19** with definitions and units of measure and summary statistics for all variables are presented in **Table 20**.

Equation Specification

The following equation is used for ordinary least squares regression analysis with a total of 24 observations from the June and October auctions. Through the use of the statistical package for social sciences (SPSS) statistical program, multiple equations were tested to identify the significant variables and best equation to explain the relationship between the independent variables and the average award price. Coefficients and residual statistics for the equation are presented in **Table 21**.

Discussion of Price Analysis Results

The adjusted R square shows that **Table 21** was 0.96% of the variation, indicating that in the average award, price is explained by the independent variables. The standard error of the equation was US 2.03 cents/kg in comparison to the mean average award price of US 37.5 cents/kg. Thus, the equation estimates the average award price to within plus or minus US 2.03 cents/kg over 66% of the time or within one standard deviation.

The Durbin-Watson test results were inconclusive when testing for autocorrelation, indicating that autocorrelation is not a serious problem in the model. Additionally, the Breusch-Pagan test was used to test for heteroscedasticity due to the cross sectional nature of the data. The test resulted in not rejecting the null hypothesis of homoscedasticity.

Prior Knowledge — The PRIORKNOW coefficient of prior knowledge (learning about previous prices paid by others) from the previous auctions based on lagged market clearing price was positive. For the June auctions a 1 cent/kg increase in the prior knowledge variable results in the average award price increasing US 0.55 cent/kg. Combining the interaction variable with the PRIORKNOW variable to determine the influence of prior information on the average award prices in the October auctions reveals that a 1 /kg change

in the prior knowledge variable resulted in a US 0.87 cent/kg change in the average award price.

These coefficients were both significantly different from zero with 99% confidence and indicate that knowledge of the prior auction results were highly significant in influencing the current auction. Furthermore, the value of 0.87 is not significantly different from one, indicating that the October auction was more efficient than the June auction with the use of prior price information in determining the average award price. This results supports the practice at the auctions of immediately publicizing the price information.

Supply – Long run supply had a negative coefficient because the supply was rationed at all auctions. The total supply was known at the beginning of the auctions with the total quantity available for sale diminishing at the conclusion of each auction. The June auction coefficient indicates that the average award price increased by 0.38859 cent/kg for every 1,000-mt decrease in the remaining total supply at the June auctions. Therefore, at the final auction the average award price was US 3.97 cents/kg higher than the average award price at the first auction ($10,220 \text{ mt} * 0.0003886 \text{ cents/mt}$) due entirely to a diminished supply.

The long run supply coefficient for the October auctions, incorporating the slope shifter, showed that the average award price increased by US 3.3 cents/kg for every 1,000-mt reduction in the remaining total supply. Thus, after selling 1,000 mt at the first auction for swine supplement in October, the average award price was estimated to increase by US 3.3 cents/kg.

Demand – The coefficient for the total quantity demanded at an auction, DEMAND, had a positive coefficient indicating that higher demand resulted in a higher average award price. The coefficient indicates that the average award price increased by US 2.3 cents/kg for each additional 1,000 mt of supplement demanded.

Distance – Bid prices reflected transportation cost discounts for distance from the delivery point, Constanta, to the farm. The estimated discount was \$10.79/mt for every 100 km between farms and the port. In comparison, the state-operated feed company, Nutricomb provided a schedule of railway freight charges in March 1993 with a cost of

US \$3.82/mt for a 100-km transport, not including loading and local delivery fees. Even if these charges were included, it appears that private farmers reduced bid prices by more than the cost of commercial transportation. With the significant difference between commercial rail rates and the bid price reductions by farmers, an economic incentive existed to arbitrage the transportation differential and further develop the agricultural inputs infrastructure.

Disposition of Proceeds From the Auctions

As required by the terms of reference proceeds from the two auctions were deposited in a special account of the MAA at the Banca Agricola in Bucharest. A summary of balances and the exchange rate as of March 31, 1994, are shown in Table 22 and a depiction of the flow of financial transactions is shown in Figure 4.

On February 21, 1994, CL issued a final report on the status of the special MOA/MOF account held with Banca Agricola. An updated final report was issued by CL on March 31, 1994, to reflect an additional deposit of 500 lei and to correct a typographical error in the February 21 report. The updated CL Final Report shows the balance in the special account as of March 11, 1994, as 6,285,957,923 lei consisting of deposits and interest.

As of March 31 (at which time US \$1 = 1,650 lei) the amount in the special bank account was US \$3,809,671.47. The above total amount agrees with the bank statement issued by Banca Agricola on March 11, 1994. Copies of the CL final audit reports were sent to USAID, Bucharest, along with a letter informing them of culmination of the responsibility of IFDC for the account in accordance with the grant.

Performance Indicators of the Swine and Poultry Feed Supplement

Characteristics of the Swine Sample

To monitor and evaluate the performance of the swine feed supplement, 42 farms in 30 districts were sampled between August 1993 and April 1994. The sample comprised 293 hogs and 298 piglets or 591 animals. In August 1993 baseline data were gathered on the

performance of local feed, that is prior to using the imported high protein supplement. After baseline data were collected, monitoring and evaluation of the performance of the feed supplement was conducted periodically from October 1993 to April 1994. The feeding recommendations made by IFDC/ASA were not always followed due to lack of the appropriate grain and/or limited supplies of the IFDC-imported supplement.

The basis of the swine feed varied during the monitoring period. During August-October barley was used, and from November-April 1993, maize was used. The performance of the supplement was also affected by unusually cold weather in November 1993 after a short period of warm weather followed by a wave of cold weather in January and February 1994. A lack of fuel for heating was a critical problem that stopped breeding in the winter of 1993/94.

Performance Indicators of the Swine Feed Supplement

As shown in Table 23, prior to the use of the supplement imported by IFDC, an average of 285 days was required for a hog to reach a marketable weight of about 100 kg. On average this time requirement was reduced by 65 days to 220 days or by 23% following the use of the imported protein supplement. The performance of the supplement was also impressive as indicated by a mean daily live weight gain of 0.56 kg compared to 0.39 kg before supplement use. Thus, on average hogs gained about 17 kg per month with the imported protein supplement, compared with 12 kg previously.

The amount of feed needed to produce 1 kg of weight declined substantially from 9 kg to 6 kg after supplement use – a 33% decrease. The mean weight of weaned piglets per sow at 21 days increased dramatically from 32 kg before supplement use to 46 kg after use – a 44% increase. The mean piglet weight at 21 days increased to 6.0 kg after supplement use compared to 4 kg prior to use; an increase of 38%. Finally, the mean number of piglets per sow increased from 8 kg before supplement use to 9 kg after use.

Performance of the Poultry Feed Supplement

Broilers – During 54 days in November-December 1993, a controlled experiment with 140,000 broilers was conducted to determine the performance of the poultry feed supplement imported by IFDC. The sample was divided into four experimental groups and

one control group. The experimental group received the imported supplement and the control group received a domestic feed of maize and sunflowers. During the first week the experimental group received feed with 22% crude protein, 20% in the second and third weeks, and 16% from the fourth week until slaughtering. The recommended practice of feeding broilers 18% crude protein during the finishing stage was not followed because a limited quantity of 80 mt of supplement was purchased by the farm in the Constanta district where the experiment was conducted.

As shown in Table 24, the performance of the poultry feed supplement for 60,000 broilers in five additional samples was superior to that of the control group. The mean weight gain during 54 days in each sample exceeded that of the control group by 30%-40%.

The mean feed conversion rate was decreased by about 25% from 3.2 kg to 2.4 kg. Most significantly, on average the mortality rate of the samples was 64% less than that of the control group.

In addition to the above controlled experiment, broiler production and performance of the feed supplement were monitored on nine farms with data collected on a total of 115,000 broilers. The base feed of maize/wheat (75%), fish meal (5%), and protein supplement (20%) was constant during the monitoring period of 54 days. The performance of the feed supplement is very similar to the results of the controlled experiment. Specifically, at the end of 54 days, the average weight was 1.7 kg with a feed conversion rate of 2.2 kg feed for 1 kg live weight gain. Prior to the use of protein supplement, these figures reported by the farmer were 3.5 kg feed for 1 kg live weight gain with an average market weight of between 700 g and 1,000 g after 95-100 days.

Layers – Between August 1993 and April 1994, attention was also given to the performance of the feed supplement for layers. Although the data are inconclusive, three private farms reported the number of eggs produced per 100 hens increased by an average of 19% with supplement imported by IFDC. Furthermore, total feed consumption decreased 12% and on average the feed conversion rate improved by 17% in terms of egg production.

The severe winter of 1993/94 without heat for the hen houses, improper and low level use of the poultry supplement by farmers because of depressed egg prices due to an abundance of imports, and a common feed for broilers and hens, all contributed to inconclusive and mixed results. Some farmers reported a decrease in egg production and attributed this to the supplement. This conjecture is unfounded. Undoubtedly, future controlled experiments would show better results provided the supplement is used properly and other growing conditions are controlled. It is important to note that eggs are not graded by size in Romania and total eggs rather than weight per egg is a measure of performance that is currently most meaningful to farmers.

The data on the performance of the feed supplement for swine and broilers show excellent results. The data for layers are inconclusive. The outstanding results stimulated interest and demand for supplement among Romanian farmers. Unfortunately, as this demand flourished, the supply was interrupted and demand was created for an unavailable product. This was disappointing, indeed very disappointing, for farmers who survive on the margin. The policy of GOR not to allow importers to convert local currency into U.S. dollars eliminated the U.S. suppliers from participating in the commodity import program.

Management of Animal Waste and Environmental Issues in Romania

As part of the terms of reference, an environmental assessment of animal waste management in Romania was required. There were three major requirements for this work:

1. Assess and analyze the waste management practices of the swine and poultry production industries in Romania, with special emphasis on the larger production units.
2. Develop recommendations for a waste management plan that will eventually change the standards of the Romanian animal production sector closer to those of the United States and the EU.
3. Develop an implementation plan for the proposed recommendations.

The assessment of animal waste management was conducted by a U.S. animal waste management specialist, a Romanian waste management specialist, an environmental regulations specialist, and a soil fertility scientist. The team visited 51 swine production facilities and 17 poultry production facilities that represent about 10% of the swine herd and 5% of the poultry in Romania in 1992. Of the 51 swine production facilities assessed, 42 were privately owned and 9 were state owned. Of the 17 poultry production facilities assessed, 12 were privately owned and 5 were state owned. The team visited 47 facilities that purchased feed supplement during the first auction. These facilities ranged in size from 4 swine to over 150,000 and the poultry facilities ranged in size from 6,000 to over 880,000. Most of the state swine and poultry sites visited represented only one location (satellite) of several within a radius of a few kilometers. For example, a farm with 150,000 pigs was actually 1 of 10 satellites within a few kilometers of each other, which had a total of 460,000. One of the sample poultry farms with 200,000 birds was actually one of nine satellites with a total of 16,000,000 birds.

The sample farms were selected based on the following criteria: (1) type of ownership, (2) if private, whether the farms purchased feed supplement during the IFDC auctions, (3) geographic location, (4) type of animal production, and (5) size. **Figure 5** shows a map of Romania illustrating the geographic location, type, and ownership of farms sampled. **Figure 6** shows the location and size of the sample swine farms, and **Figure 7** shows the location and size of the sample poultry farms.

Data Collection

To assess the management of animal waste in Romania, data collection forms for poultry and swine farms were developed and farmers were questioned. Data collected included the type and capacity of the facility and all available information about the management, treatment, and use of animal waste. Data on production capacity were collected to provide an estimate of the magnitude of waste from each facility based on standard tables of waste generation.

Waste collection systems were classified as gravity drain, flush, mechanical scraper, hand wash, hand scrape or sweep, and dry litter collection. Waste receiving systems were classified by the use of collection basins, lift pumps, decanter or distributor systems, and

solids settling basins. Solids settling systems were classified by construction type, primary dewatering systems, and any secondary dewatering system. Data were also collected as to whether separated solids were distributed on land and used in crop production. If solids or slurry were used for agriculture, data were collected on the method of application and, if mechanically applied, the type of application equipment used. If available, estimated or actual application rate data were also collected.

Data were also collected on any additional treatment before discharge or application on land. Data were collected on other environmental concerns such as overall facility aesthetics, odors, dead animal disposal, apparent or documented groundwater contamination, public and personal safety, distance from surrounding residential areas, and availability of crop or pasture land for use of waste. Data were collected on the design and construction of any waste treatment or storage lagoons including soil types, the use of concrete or synthetic liners, the depth to groundwater, available storage retention, and whether wastewater was being discharged on a continuous, intermittent, or infrequent basis. If discharge was observed, additional information was noted on the quantity and quality of effluent, the receiving body of water, and a subjective analysis of the impact of the discharge on the receiving water body. If irrigation equipment was available and used for spreading liquids on land, information was sought on the equipment type and design. Potential adverse environmental effects for each facility were summarized, and recommendations for improving operations were noted.

The data collected from 51 swine farms and 17 poultry farms are summarized in Table 25. A total of 26 (38%) have treatment facilities above the national standard that typically consists of methane generation, activated sludge systems, forced aeration basins, and long-term lagooning. Most other systems are not working or were never completed. These types of systems, which generally are not necessary if the waste is used for agriculture, also add unnecessary capital and operating costs.

Eighteen farms (26%) have storage lagoons that receive either the entire slurry (solids and liquids) or the wastewater from the waste collection system. Some lagoons serve their purpose and appear well constructed, but some are virtually idle and poorly constructed. Of the 68 sample farms, 20 (29%) reported that the surrounding groundwater was used by the

local population. Twenty-four (35%) of the farms did not know if the groundwater was used by the local population.

On twenty farms (29%) there were local restrictions on use of animal waste. For example, several of the farmers were concerned that animal waste would burn crops because it contains disinfectants (caustic soda). Additionally, the collapse of state farms was cited as a reason for reduced use of animal waste for agricultural purposes.

Thirty-five farms (51%) indicated that irrigation equipment was available in the area and 38 (56%) indicated that equipment to spread solids was available in the area. Equipment to spread animal waste was found, but most of it was broken and useless. Only 18 (26%) farms indicated that they have sources of information available pertaining to waste management. Most of this information is available through the Ministry for Agriculture and Food (MAA).

Most areas of the country have soils that would permit lagoon construction without undue risk of groundwater contamination. Forty farms (59%) indicated that the soil type in that area contains a significant percentage of clay. Twenty-one (31%) of the farms did not know the type of soil in their area. Based on observations, it appears that the majority of the 21 farms have soils with a significant percentage of clay. There was great variability in the groundwater depths quoted by the farmers that ranged from less than 2 m on four farms to greater than 20 m on eight farms. Given the typical soil type and typical groundwater depth, it does not appear that groundwater contamination is a national problem, although there are undoubtedly some problem areas.

Of the 36 farms that discharge waste to surface waters, 23 were evaluated. The discharges ranged from light to black in color with the majority being gray to black. The discharge rates ranged from less than 50 m³/day to over 1,000 m³/day. Based on the rate, color of effluent, size of the receiving water body, and proximity to the public, many of these discharges are significant. In many cases, the discharge was the entire waste slurry. A summary of the utilization and/or discharge of swine and poultry manure is shown in Figures 8 and 9, respectively.

Current Conditions

Most of the large swine and poultry farms in Romania were designed and built originally as state or communal farms in the late 1960s to early 1980s. The average farm age is approximately 20 years. The design emphasized treatment for discharge using technologies typical of municipal or industrial waste treatment. Research and practice in large-scale animal production in other countries have demonstrated that significant economic and environmental advantages are gained by efficient use of animal waste on land for agricultural purposes. One advantage is the tremendous amount of valuable plant nutrients and organic matter that can be provided for agricultural production with no environmental degradation when waste is efficiently and properly used. The technical problems and costs of treating large amounts of waste to states that are environmentally acceptable for discharge make agricultural uses of waste even more attractive.

Unfortunately, swine and poultry producers are naturally inclined to emphasize meat and egg production rather than environmentally sound waste management. The current conditions in Romania developed apparently because environmentally sound waste management has not been effectively integrated into production economics or regulated effectively.

A majority of the waste management systems were originally of very similar if not identical design, but many were never completed as designed and others were modified or modernized at some time. Of the farms visited, the design and operation of the systems ranged from no waste management at all to complete treatment, but most are not adequate treatment, even if well operated. Romania does not appear to have adequate engineering technology and resources for efficient and effective waste spreading and use in agriculture.

Economic constraints restricted the construction and maintenance of waste management facilities. Privatization is a recent occurrence for many farms and a continual process that will eventually affect the remaining state farms. At the time of this study many private farms had formidable economic problems, many ceased operations, and the future of others does not appear bright.

Most waste receiving and handling systems in Romania may be classified in three categories based on conceptual designs. The first category includes mainly the larger swine farms, which were all designed for passive or active hydraulic collection and handling of waste.

The second category includes the large-capacity poultry production systems that use dry manure or semi-liquid/slurry systems. Most of the layer farms and some broiler farms use this type of system, which produces a concentrated manure slurry that varies in moisture content depending on water management and environmental conditions. If water leakage and use are limited in poultry houses, waste may be handled as a semi-solid. The moisture in poultry waste often requires handling as a semi-liquid slurry. These systems typically use enough wash water to create a separate liquid waste stream regardless of whether the main manure collection system produces a slurry or stackable waste. The third category, which includes most of the broiler operations and a few layer operations, uses a bedded floor litter system, which produces a stackable waste that is virtually dry. The only liquid waste stream from these kinds of facilities is a moderate amount of wash water from cleaning poultry houses.

Dry manure from poultry and swine is used typically on land much more frequently than liquid or slurry waste streams. Consequently, handling dry manure tends to be less of an environmental concern than does liquid waste. A few small swine and poultry farms were evaluated and most handle waste as a solid and pose few environmental problems when compared to large farms.

Recommendations

The environmental problems related to waste from swine and poultry in Romania can be attributed to several factors including (1) lack of supportive government policy and incentives, (2) technical problems in system design, (3) management and maintenance problems, (4) socio-economic problems, and (5) lack of understanding about, and support for, recycling nutrients from animal waste.

With a population of about 11 million swine and over 100 million chickens, the annual production of animal waste is in excess of 12 million mt not to mention huge volumes of contaminated liquid effluents. The 12 million mt of manure produced annually contains an estimated 100,000 mt nitrogen (N), 75,000 mt phosphorus (P), and 80,000 mt potassium (K).

A well-coordinated and concerted effort with commitments from GOR and the donor community is required to define and implement beneficial policies to mitigate environmental problems of waste management in Romania. For example, the EU nitrate directive (91/676/EEC) requires the identification and designation of sensitive waters and critical zones that potentially contribute to pollution. This type of reporting requires extensive sampling and data analyses of soil, manure, and water.

The problem of environmental pollution from animal waste could be mitigated through the following activities:

- A national conference for Romanian livestock producers, MAPPM, MAA, Ministry of Education, various technical institutes, and Romanian and international animal waste experts. Such a conference should analyze the problems from various perspectives and recommend alternatives.
- A study tour of animal waste management facilities in the United States for several livestock producers, MAPPM technical representatives, and MAA technical representatives to enable them to observe and gain familiarity with the most appropriate technology.
- A comprehensive surface and groundwater monitoring and documentation program to support environmental policy decisionmaking and enforcement.
- An assessment of the economics of the livestock industry to determine the benefits of investments in capital facilities to manage waste in an environmentally sound manner.
- Guidance for the development and implementation of a program of government policy, incentives, and regulations to eliminate or at least reduce discharges of animal

waste, preferably by use in agriculture. Secure and legal titles to land are necessary to promote the use of animal waste for crop production so that waste becomes an economic asset rather than an environmental liability.

- Technical assistance and financial resources for feasibility studies and renovation of facilities to promote the use of animal waste for agricultural purposes.
- A program of research, demonstration, and education to support the economic and efficient use of animal waste in agriculture. Alternative technologies, such as the generation of biomethane and other capital-intensive processes, should be considered as potential means to enhance the economic and environmental performance of livestock production.
- Programs for the recruitment, support, training, and use of animal waste engineers to provide the private sector with technical analyses on design, renovation, construction, management, and support services for waste management.
- Enhancement of the agricultural engineering, animal science, and soil science curricula of Romanian institutes and universities in the areas of waste management, use, and environment. Such training would provide well-trained Romanian nationals to design, monitor, and regulate animal waste management.
- Technical assistance for MAPPM and MAA to develop beneficial policy, rules, design guidelines, monitoring procedures, and staff training for regulation of animal waste management.

Discussion of Recommendations

Conference-Workshop on Animal Waste Management

There are numerous perspectives on beneficial and environmentally sound waste treatment and disposal in Romania. Developing leadership for a convergence of technical and philosophical directions among the various ministries, institutes, and animal production

personnel in Romania is an important first step towards mitigating environmental problems. A national conference-workshop involving the livestock, staff from the MAA, the MAPPM, and the Ministry of Education, agricultural waste management specialists, and other interested and knowledgeable persons allowed the review of the various problems and the analysis of possible alternatives and solutions. The conference-workshop held in October 1993 was an educational experience for all participants and help create a consensus for improved animal waste management in Romania. The conference-workshop had a well-defined but broad agenda including regulatory philosophy and the broad spectrum of technical and economic issues. Introducing and planning the major components of a comprehensive program for improvements was an integral part of the program.

U.S. Livestock Industry Technical Study Tour

The GOR and industry officials expressed skepticism about the usefulness of U.S. waste management technology for Romania. A study tour of facilities in the United States is one means to educate the technical and political leadership of Romania. A number of large livestock facilities could be visited in the United States to observe waste collection, treatment, storage, and use. Various suppliers of waste handling and irrigation equipment could also be visited. There is a critical need for Romanians to learn about modern irrigation equipment to use waste for agricultural production.

Monitoring Water Quality

Most countries have policies and regulations that virtually preclude the discharge of significant quantities of animal waste to public waters. Apparently there are no data available to document the impact of such discharges in Romania even though the MAPPM stated that there are programs for sampling and data collection. The development of sound environmental policy should be based on potential or actual water quality degradation with an analysis of the economics of improving the water quality. A program of water quality monitoring should be implemented to assess surface and groundwater in Romania. Sampling periods should cover all seasons and include quantifying effluent flows, surface and groundwater flows, and qualifying pollutant loads. Samples should include stream flow above any known point of discharge, the discharge per se, and stream flow. Flow volumes of the stream and the discharge should also be documented.

Because of the importance and complexity of this task, a study to identify specific bodies of water and discharges to define water quality issues is recommended. Existing research programs and data should be identified and used in such a study. The study would be a logical and useful extension of the present study and could use much of the farm data to identify potential discharges and water bodies of concern. Such a study including methods, the sampling area, number and types of samples required, and resources should be defined in a project proposal which IFDC is willing to prepare and submit for funding.

Economic Assessment for Environmental Compliance

In many cases, improvement of waste management facilities will increase the costs of pork production. The additional costs would vary by farm size, availability, and conditions of the area where waste is used, region, and other physical and economic conditions. Currently, pork producers face a volatile input market and a government-controlled output market in an inflationary economy. These economic uncertainties introduce considerable risk in production and long-term investment in waste facilities.

Under current economic conditions, a number of private facilities are in severe financial straits, several have been foreclosed, and others face similar losses. Anecdotal evidence suggests that a major contributing factor is government output price policy that forces a price-cost squeeze on pork farmers.

There are certainly major costs in achieving compliance with improved standards, and if compliance policies are pursued in the current economic climate, additional financial problems will result. Therefore, efforts to develop regulatory policies to support environmental improvement would be enhanced greatly by a sound assessment of the current and projected economic conditions in the livestock sector. Such an assessment should be conducted to determine current profitability and the consequences and costs of enforcing improved environmental regulations. The economic conditions of private and state farms should be compared across regions, farm sizes, and ecological conditions. Evaluations should be made of various incentives or funding sources that would enable the livestock industry to comply with improved environmental standards.

Technical Assistance to Develop Government Incentives and Regulation

As this study has documented, much of the environmental degradation caused by the swine and poultry waste in Romania is due to government policies that originally allowed or even encouraged the discharge of inadequately treated waste to surface waters. Any significant reduction in the discharge of animal waste from large and concentrated production facilities will occur only if there is a rational and effective reversal of these policies. The development of beneficial government policies and programs to promote and regulate environmental improvement requires a comprehensive understanding of environmental problems.

These problems and technologies are not always defined easily, even in the EU and the United States, where data on water quality and qualified technical expertise are available. Regulatory and incentive programs for Romania should be based on the most practical and economical technology to meet the specific water quality standards.

The use of animal waste for agriculture is the cornerstone of simple waste storage and use schemes and can provide a basis for mitigating the majority of environmental problems resulting from intensive animal production in Romania. The benefits of minimal waste treatment with comprehensive nutrient recycling are improved economics and environmental conditions. Policies should be defined to encourage adequate land availability for waste use. Only after using animal waste for agriculture should any significant resources be directed to alternative technologies such as biomethane generation, refeeding of waste, or other treatment strategies.

The development of government incentives, policies, and regulations requires reliable and valid environmental data. Technical assistance is also required to support the GOR in developing environmental policies to reduce discharges of animal waste. Experience gained in regulating livestock waste on large concentrated production facilities in the United States and other countries should be used to help ensure the efficiency and effectiveness of such a program in Romania. This would be a logical extension of this study and would make good use of the lessons learned in Romania.

Such an effort requires the development of a relationship of trust and cooperation between project staff and the MAPPM and the MAA, and such a relationship was created during the current study. The development of beneficial policies and regulations requires an effective working relationship with ministry personnel to acquaint them with practical and effective technology for concentrated livestock production facilities. However, existing technologies must be adapted to the conditions and unique requirements of Romania.

Technical Assistance in Facility Design and Remodeling

Most of the liquid waste treatment facilities surveyed in this project were significantly more complex to build and operate than is typically the case for effective waste management facilities in the United States and the EU. Even so, the result is significant pollutant discharge that would never be allowed in the United States or the EU. There appear to be two main reasons for this: (1) systems were designed to provide extensive treatment and discharge of waste to surface waters rather than emphasizing waste use for agricultural purposes and (2) widespread use was made of complex and expensive municipal and industrial waste treatment technology for handling a waste stream that is largely incompatible with those technologies. The animal production industry cannot justify the costs of building, maintaining, and operating such facilities. Additionally, these systems are not necessary from an environmental standpoint. Without using the nutrients in waste, there is no economic return to offset costs. Very few of the facilities were ever completed as recommended by designers. The operation and maintenance of a complete treatment process was observed on only one sample farm.

A program of technical assistance that uses efficient agricultural waste management engineering to analyze and enhance waste collection, processing, and use, is recommended. Education is required to change the discharge approach and emphasize the importance of recycling. Improved systems will be generally simpler and easier to maintain and operate, improve water quality, and ensure recycling of valuable nutrients for the benefit of Romanian agriculture.

The program should include the improvement of at least one major swine facility in each major production area or geographic region. Poultry facilities that are not using solid and liquid waste for agriculture should also be considered for technical assistance and

facility improvement. Consideration should also be given to broadening the project to include waste handling and use on beef, dairy, and sheep farms. The importation and use of modern irrigation equipment should be considered as necessary to ensure efficient and dependable systems that will improve the likelihood of early success in these efforts. Technical assistance should be provided in conjunction with the use and training of Romanian animal waste management engineers. This would create domestic professional services to design, construct, manage, monitor, and regulate such facilities.

Engineering techniques for agricultural waste management should be used to assess existing facility capabilities and design of the most efficient modifications to obtain environmental protection. Projects should be designed to achieve the most simple and economic waste collection, storage, and use possible. By using Romanian technical resources under the direction of qualified waste management engineers, such a program would offer on-the-job training. Simultaneously, the environmental performance of the facilities would be improved. When such a project is complete, waste management on selected large livestock production farms should be improved, undoubtedly. Additionally, such a project would create a group of well-trained waste management engineers to work privately with livestock production farms or as regulatory personnel.

Research and Demonstration

As this study has documented, there is an obvious lack of information and knowledge in Romania about the use of animal waste as a source of crop nutrients. The provision of useful information requires significant research, demonstration, and educational efforts. A demonstration program with an aggressive and well-planned program demonstrating the benefits of recycling nutrients on cropland is needed. This would promote the changes in attitudes that are necessary to reverse the discharge procedures that currently dominate animal waste management in Romania.

Funds are needed for facilities and operations to be modified and achieve beneficial waste collection, storage, use and demonstration of improved technologies to producers and the MAPPM in Romania. Additional funds will be needed for monitoring and research on the proposed system modifications to answer questions on the efficacy and safety of approaches widely used elsewhere but untried and unproven in Romania. Agricultural use

of animal waste should be the cornerstone of this effort and peripheral technologies such as methane generation should only be considered after a foundation technology is established. Automatic irrigation systems should be used as appropriate to ensure dependability. Seminars and field demonstrations on nutrient use and recycling should be an integral part of this program. An opportunity to introduce technology to producers and waste management professionals not participating directly in technical assistance or research and demonstration would also be realized. This component would complete a comprehensive program for addressing the environmental problems posed by animal waste in Romania.

Policy Reform

Several lessons can be learned from animal waste practices in the United States and other countries. One general lesson is that agricultural use of waste is more economical and environmentally sound than treatment for discharge. Another lesson is that the technology of agricultural waste management is significantly different from the technology of municipal or industrial waste treatment. Therefore, the regulation of agricultural waste management requires a different approach than the regulation of municipal or industrial waste treatment. Consequently, a separate agricultural waste management program should be established within GOR environmental agencies and staffed by qualified waste management engineers.

Experience has also shown that technical assistance for the design and operation of waste management facilities should not be a regulatory function. Generally, technical design services are provided more effectively by private agricultural engineers. Regulatory functions for agricultural waste management should reside in MAPPM.

The regulatory waste management section of MAPPM should be staffed with well-qualified waste management engineers and technicians. Effective regulatory programs should be defined to eventually eliminate all discharge of animal waste into waterways. Such a project should provide technical assistance as required to (1) hire and train personnel, (2) define regulations, (3) recommend design guidelines, (4) define design review and approval procedures, and (5) define procedures for operational reviews, approvals, monitoring, and enforcement.

Regulations and guidelines should be designed to protect the environment and be based on performance to ensure the use of the most cost-effective technology. Waste recycling should be given high priority, and nutrient conservation and use should be encouraged whenever possible. Likewise, other environmental considerations such as aesthetics, odor control, disposal of dead animals, and public safety should be addressed. Finally, all waste management practices should be designed and managed on the basis of economic, environmental, and scientific principles.

Environmental improvements will require changes within the economic and political institutions in Romania. With respect to waste management from confined livestock, the greatest challenge will be to change the policy of waste treatment to one of agricultural use. Emphasis should be placed on the modification of existing waste management facilities to accomplish complete waste use. Policies should support the domestic production or importation and use of modern irrigation equipment to ensure dependable systems of waste application on cropland.

One of the most important policy changes will have to link land availability for waste use to large livestock production facilities. Securing land titles for small farmers is of paramount importance here. This could be achieved by direct ownership of land by a production facility as is often the case in other countries. Another alternative may be agreements on waste use for agriculture that require landowners to use a certain quantity of waste as long as it is environmentally safe. Cooperation between the MAA and the MAPPM will be necessary to achieve adequate land availability and use for waste recycling.

A regulatory philosophy that has been used successfully elsewhere when a facility is not in compliance with regulations but desires to achieve compliance as economically as possible is suggested for Romania. As a first step, the regulatory agency documents violations and noncompliance and outlines goals for compliance. The agency then requests the producer to prepare an assessment of the current capabilities and recommended modifications to achieve environmental compliance. Facility assessments are typically performed by a waste management engineer and this assessment defines current waste management capabilities and needed improvements including cost estimates and a timeframe for accomplishing the improvements. If approved by the regulatory agency, the system is designed and construction is initiated. As

long as responsible progress is being made, there are no fines imposed on the producer. This approach of assisting the producer is more beneficial than a punitive approach. In this approach, money that may have been paid in fines is used to help define and implement a practical solution. With the environmental and economic problems of animal production in Romania, there is no justification for a punitive policy.

A Plan for Implementation

The recommendations presented in this study provide an outline for accelerating change of animal waste management in Romania from an environmental liability to an environmental and economic asset. The following is a description of a direction for such work.

Building a Consensus

The study tour of U.S. facilities and a technical conference-workshop would help build a consensus among leaders in Romania. The project would continue to build on the dialogue and confidence that was created in the current project. This proposal should proceed as soon as possible to maintain relations and address the immediate need for development of appropriate transitional enforcement policy in lieu of the current sporadic and punitive approach.

It is estimated that planning and sponsorship for a conference-workshop and facility study tour to the United States will require 4 months by an animal waste management specialist. This effort will require some time in Romania for planning the tour and conference also for followup and summary. These efforts can, of course, be conducted more efficiently in conjunction with other project tasks. Ideally, at least 15 Romanian nationals should participate in such a program. Facilities in the midwestern United States, including those for all major animals with emphasis on large swine complexes, would be visited. One or two of the waste management programs at land-grant universities should also be included. All of the major manufacturers of center pivot irrigation systems are located in the midwest and could be included in the educational tour.

Technical Assistance to MAPPM and MAA

Solutions to problems of animal waste in Romania will proceed only as rapidly as support by farmers and GOR. The resolution of environmental problems requires a coordinated

approach supported strongly by MAPP, MAA, farmers, and the general public. In order to assist the ministries, technical assistance should be provided in several areas including (1) the development of efficient and practical agricultural pollution control regulations, (2) water quality sampling, analysis, and interpretation for policy background, (3) guidance on staffing and procedures for regulatory programs, (4) development of guidelines for facility design and operation, and (5) training of regulatory staff.

Policy Guidance – Although the GOR has issued decrees that forbid pollution of surface and groundwaters with animal waste, the effectiveness of, and compliance with, the decrees are poor. The pursuit of aggressive regulatory enforcement without cognizance of the technology of agricultural pollution control and a sense of the capabilities of production facilities would be counterproductive. It is important that regulatory policies and procedures be realistic and capable of achieving meaningful and practical results. The development of well-planned and appropriate policies to control the regulatory process is essential. A reliable water quality monitoring program should be developed and be an essential part of the regulatory process.

The development of appropriate incentives should also be considered to increase the use of animal waste for agriculture. There are several incentives that would promote the economic use of nutrients and protection of the environment. Secure and legal titles to land for farmers is a requirement to provide incentives for farmers to use animal waste for agricultural production. Because virtually all facilities were built and operated without using surrounding land, a change is required. The MAA and MAPP should also explore alternatives for providing adequate land to livestock producers for waste use. Effective change from discharge of nutrients to recycling for agriculture will not occur without secure land titles or other means and incentives. A program to create that change should be defined and implemented. One suggestion is to begin small demonstrations of the value of animal waste for crop production among farmers who have secure title to their land.

It is recommended that technical assistance be provided to the ministries in the form of professionally qualified animal waste management engineers with extensive experience in the fields of waste management design, operations, and regulations. This effort would concentrate on assisting the ministries with policy and program development. The estimated effort is 8 workmonths over 2 years. It is estimated that 4 workmonths would be required in the first

8 months of the project. The remaining 4 workmonths would be contributed over the remaining 16 months.

Regulation of Animal Waste Use and Disposal – Efficient regulatory programs in the area of animal waste management require a well-founded combination of enforceable regulations, practical design review and approval, and operational approval and monitoring. It is recommended that technical assistance be provided to develop a program for the MAPPM. Technical assistance should be provided in the selection and training of staff, the development of efficient procedures for design review and approval, and operational monitoring and enforcement. Significant technical assistance should be provided to the MAPPM, MAA, and appropriate environmental, agricultural, soil, and water institutes to develop simple and appropriate design guidelines. Emphasis should be on facility performance from an environmental perspective rather than on adherence to a narrowly defined technology or design approach.

It is estimated that this effort would require approximately 3 years. This time would allow training a contingent of Romanian agricultural engineers in the technology of site evaluation, design review and approval, operational monitoring, and enforcement activities. The most extensive effort would be in the initial year to develop guidelines for design and operating review and approval.

Technical Assistance to Livestock Producers

Virtually every animal production facility surveyed will require significant site-specific engineering to define the most feasible renovation. Engineering expertise in animal waste management does not appear to exist in Romania. It is recommended that waste management technical assistance be provided to individual producers in conjunction with identifying and training appropriate Romanian engineers to become qualified to render similar services in the future. At an appropriate time in their training, it would be beneficial and instructive for the Romanian engineers to spend a few months in the United States to learn about the design, construction, and operation of animal waste management facilities.

It is recommended that two or three full-time waste management engineers be provided at the outset. This level of involvement can be reduced as the Romanian engineers begin to

take on more responsibility. Ideally, a portion of the financial support for the project could come from the ministries and the livestock producers. From experience in the United States, it generally requires 3-4 years to train agricultural waste management engineers. However, technical assistance may be necessary for 5 years or longer.

The initial farms selected for renovation would serve as part of the research and demonstration portion of the program. There may be a need for financial support from Romanian or international sources for construction work, irrigation equipment, application equipment, or other waste management facilities.

Research, Demonstration, and Education

There is a tremendous need to demonstrate the benefits of using the nutrients from animal waste for agricultural purposes. It is recommended that financial and technical support be provided for research and demonstration projects that will increase the understanding of the value of nutrient recycling. If technologically appropriate and economically sound, the production of methane should be demonstrated using the most current and low-cost process and construction. It is recommended that at least one full-time animal waste management engineer and a soil scientist be supported to design appropriate research, demonstration, and educational seminars over the next 5 years. It is important to support the use of properly designed irrigation equipment to ensure that these demonstrations are instructive and useful. Support should be provided to assist the soil science program for animal waste use at the Research Institute for Soil Science and Agrochemistry and to use their resources in the development of research, demonstration, and education efforts.

Agricultural Engineering Education

There are currently no programs in Romania for training agricultural engineers in animal waste management. It is recommended that at least one full-time agricultural waste management engineer be supported to begin curriculum development and staff training in an agricultural engineering program at a university in Romania. This support would require a minimum of 5 years. Additional support should come from the MAA, the MAPPM, and other international sources.

Economic Assessment for Environmental Compliance

Romania has virtually no economic data or economic studies on the current financial status of the livestock industry. Further, an assessment of how various waste management investments may benefit individual farms and the overall economic viability in the industry is needed to judge how the industry might be affected by new environmental regulations. Credit requirements and other policy changes needed to facilitate investments should be identified and developed. Such an economic and policy assessment is important for beneficial policy development. This is a logical consequence of the current effort and should begin as soon as resources are available. Technical resources to conduct such a study would involve agricultural economists with assistance of an animal waste management engineer. An estimated 20 workmonths are projected for an agricultural economist and approximately 4 workmonths for an animal waste management specialist.

Reforming Agri-Inputs Markets

Agricultural Policy

The GOR has two main objectives in its agricultural policy. They are to (1) increase agricultural production to satisfy domestic demand and (2) enhance the economic efficiency and social organization of agricultural production. According to the World Bank staff in Bucharest, there has been virtually no progress in the implementation of their agricultural sector reform recommendations since 1993. The GOR does not accept recommendations that state farms be fully privatized except for the large industrial type livestock farms. The intention of GOR seems to be to privatize services to farmers and develop new private enterprises for farm services especially through the establishment of a cooperative law to encourage the development of member-owned and operated cooperatives for the supply of farm services. In addition, the government is attempting to establish autonomous professional associations.

A policy of market prices for agricultural inputs and outputs is constrained by a policy of the GOR to control the retail prices of basic foods. The decline in income of the urban poor and the lack of appropriate "social safety nets" are the rationale used by the GOR to justify these policies. Prices for basic foods are controlled by administered pricing via state enterprises which still dominate or monopolize output markets. These prices are set by negotiations

between the Ministries of Agriculture, Food, and Finance. During 1994, to compensate for the low controlled agricultural output prices, the GOR reintroduced subsidies for certain agricultural inputs (for example, fertilizers) and subsidized credit to stimulate use of inputs to increase production on long season crops. Also, proposals for decreased profit taxes on agricultural businesses are expected to be introduced in 1995. In addition, there were inefficient variable tariff concessions on agricultural inputs until August 1994. These were later removed to provide non-discriminatory 25% import tariffs on all agricultural inputs in line with other imports. Certain controls such as reference border prices and export market controls are also applied as part of the price fixing mechanism. Direct processor subsidies apply only to state enterprises (for example, milk factories) and significant indirect subsidies apply to most state-owned input suppliers, processors, and probably state farms. The net effect of these price and market interventions has been to (1) render price liberalization ineffective, (2) decrease incentives for agricultural production, (3) decrease incentives for private sector participation to stimulate increased agricultural production and agribusiness, and (4) render the "social safety net policy" ineffective.

Organization and Structure of Agriculture

Since the revolution, the collectivization policy has been reversed and individual landholders' rights have been recognized. Approximately 24 million individual land parcels are recognized and 5 million landowners have had their rights restored, although there are protracted delays in the cadastral survey to identify individual plots and the subsequent issuing of land titles. At the end of 1993, 93% of the eligible landowners had received certificates verifying the amount of land they would own but only 876,800 land titles had been granted. By late 1994, the Ministry of Agriculture and Food reported that about 1.5 million land titles had been granted.

The GOR has not accepted a policy recommendation of the World Bank that the state farms should be privatized. The GOR intended to transform all state farms into a national agricultural society comprised of 100% state-owned enterprises. This plan failed and former owners of state farm land were granted shares of up to 10 ha each in the unimproved land value of state farms. This has resulted in approximately 0.6 million ha of the 1.8 million ha of

state farm land now being "owned" by the private sector as shareholders in the state farms. State farms have been transformed into autonomous commercial enterprises.

At this time, about 80% of all agricultural land belongs to the private sector on paper, even though not all of this land is under their physical control. Approximately one-half (4 million ha) of this land has been organized into associations while the remaining 4 million ha is farmed by individuals. The average total size of these individual farms is less than 2 ha, often split into several small noncontiguous plots.

Former cooperative farms are now organized as commercial associations or farm associations with legal status. Former collective farms are now managed by the individual owners or in family associations, which are non-legal loose associations of family members and non-members. It is reported that 40% of private land is leased or farmed on a crop sharing basis. All sorts of land amalgamations are occurring to take advantage of larger scale mechanization. In some cases, state farms are operated in conjunction with association farmland to avail economies of scale. The private landowners forming the associations receive the equivalent of a share cropping income plus labor cost or, in some cases, rent land to the state farms. These developments are particularly important in that they demonstrate that the private sector is adapting to the current circumstances of land fragmentation and lack of ownership titles and the absence of a land market to ensure that land is farmed with available machinery and technology, and it is farmed to avail economies of scale in mechanization and with access to inputs particularly in the major cropping areas of the plains. An orderly consolidation of land can be expected when the cadastre and a land market have been established, but it can be expected that there will remain a large number of small private sector farms and farmers for many years to come.

Agricultural Output

Between 1989 and 1992 agricultural crop production declined for all crops except oats, maize, and sunflowers. With the exception of soybeans, grain legumes, and oats, the production declines resulted from both lower yields and decreased area cultivated. Yields in Romania were well below European norms even prior to 1989. An overall recovery in 1993 of 12% in crop

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production was followed by an increased production of 40%-50% for the major cereal crops in 1994 due to good weather conditions. Lack of price incentives, a complete breakdown of the inputs supply distribution system, removal of farm input subsidies, and the inability to access subsidized credit by the private sector have all been factors in the production declines since 1989.

There has been a major shift in livestock production since 1989. Currently, approximately 90% of cattle, sheep, and goats are in the private sector as is 60% of the swine. Poultry and egg production are also believed to be predominantly in the private sector. Total livestock production is now reported at about 50% of that in 1989.

Agricultural Output Marketing

In the transition from central planning, agricultural output prices have in theory been freed except for meat, wheat, and milk. However, in practice there are two parallel markets, the state or official market and the private farm (peasant) market. Continued state ownership of agri-processors and wholesalers allows the GOR to set procurement prices for most agricultural products; furthermore, the use of "premia payments" continues to distort markets in favor of the public sector purchasing/processing agents. Grain prices are set for Romcereal (the state-owned grain buyer/seller) on a panterritorial and panseasonal basis related to fixed minimum quality standards. No grain quality premiums are paid for products exceeding the minimum standard.

Input subsidy schemes are being channeled through Romcereal with conditionalities for procurement of specific crops further distorting markets. Grain producers now have a choice to sell wheat, for example, to Romcereal, Nutricomb, flour millers, livestock producers, or to the peasant farm market. In September 1994, the average maize price on the peasant farm market was about 210 lei/kg compared to Romcereal's procurement price of 140 lei/kg and selling price of 230 lei/kg. Fixed margin markups within the state sector are prevalent. Nutricomb feed mills were found to be competing with Romcereal by offering prices up to 180 or 190 lei/kg maize in November 1994 which lowered their cost compared to procuring from Romcereal. At the same time, Nutricomb offered an incentive to crop producers in the form of cash payments compared to delayed payments by Romcereal. Late payments by Romcereal

effectively decrease the producer procurement price by 10 lei/kg for each month of delayed payment. Payment may be delayed as much as 2 months due to the poor financial position of Romcereal.

State farms reportedly sold output wherever the best returns could be obtained. For a product such as sugarbeets, where sales can only be made to state factories, late or nonpayment by the factories has led to litigation by state farms.

State procurement/processing agencies were established to centralize procurement from state farms, cooperatives, and collectives. They have no provision for procuring small quantities of produce from small private producers. The Romcereal and Nutricomb facilities as well as the transport operators are not set up to take delivery of small grain quantities — parcels of 500-1,000 kg. Small farmers therefore have to arrange their own delivery to these often distant central buyers, which is an inefficient, time-consuming, and costly process. There does not appear to be any significant movement towards private sector grain merchants who could buy and resell to the state procurement agencies.

Milk collection from small private farms is not available and premium payments to state dairies discriminate against development of private dairies. Prices paid by state meat processing plants for swine are administered and were increased from 1,400 lei/kg live weight to 2,100 lei/kg in September 1994. Small private meat processing plants are being established by some medium-sized private swine farmers allowing the processing and, in some cases, the wholesale or retail margins to be retained by the swine producer.

Agricultural Inputs Marketing

The organization of farm inputs supply was entirely in the state sector prior to 1990 and was centrally planned and organized to supply farm inputs through parastatals to the collectivized farm sector. Considerable fixed capital investments were made during the 1960s and 1970s in state organizations such as Romcereal, Nutricomb, SemRom (grain and other crop seed), Unisem (vegetables and orchard stock), and Agromech (farm machinery), and in state-owned fertilizer factories. The essential farm inputs such as fertilizers, seeds, pesticides,

machinery, and feed were organized by district to meet plan requirements through these parastatals either direct to state and collective farms or through the district and village Ministry of Agriculture Supply Units (Service Cooperatives). Essentially, this organization of farm inputs distribution remains unchanged, although considerable operating differences have occurred since 1993.

Animal Feeds

The 64 Nutricomb feed mills now operate as commercial enterprises. Some autonomy in management was evident from the limited number of visits made to facilities, but some central control and administration remains. Managers of Nutricomb feed mills appeared free to set purchasing prices for grains and oilseeds and were competing with Romcereal for purchases from all types of farms. It is not clear to what extent Nutricomb enterprises were better financed than Romcereal, but the higher working capital turnover of Nutricomb mills may provide them with a competitive advantage over Romcereal. This limited degree of competition will obviously be undermined by the Romcereal administered fertilizer scheme described later.

Antiquated equipment, poor quality feeds and supplements, under utilization of capacity, and a limited customer base appear to be the norm for most Nutricomb enterprises. There is a heavy reliance on a few large state livestock enterprises for each mill's sales. Apparently little or no effort was being made to expand sales to the private sector where most of the livestock is now produced.

All of the Nutricomb mills are slated for privatization in 1995 under the mass privatization law. One mill, previously owned by a cooperative, is already privatized and apparently profitable.

Limited quantities of variable quality feed supplements are being imported by Ralston (United States) but no organized distribution system has been developed and import problems, as with seeds and pesticides, still remain.

Fertilizer

Until July 1993 all fertilizers were subsidized up to 90% with direct payments to the factories, and sales were made either directly to state farms or to the Agricultural Supply Units.

Domestic prices were controlled/approved by negotiation between the Ministries of Agriculture, Industry, and Finance. Subsidies were completely removed in July 1993 and limited autonomy was given to each factory in September 1993. Companies were required to buy natural gas (the major purchased input for nitrogen production) in hard currency but were allowed to keep foreign exchange earnings from exports. Domestic prices to the farmer approximately doubled in 1993 and further increased in 1994. The 1993 subsidy removal came after the main fertilizer season and domestic sales of total nutrients ($N+P_2O_5+K_2O$) increased by 9% over 1992 to 602,000 mt, but this was only 44% of the 1980-90 average nutrient use. Although in theory there is freedom in domestic pricing for the factories, there are limitations imposed. Price increases have to be justified by cost increases to at least three major buyers which usually include Romcereal, state farms, and farm associations. The factories claim to add a 5%-8% margin above costs. However, in late 1994, it appeared that domestic fertilizer prices were about 15% above border equivalent prices based on export f.o.b. values.

Numerous changes in the farm organizations, including changes in the distribution system of fertilizers, have led to decreased domestic sales. The Agricultural Supply Units were changed to autonomous commercial enterprises. With little or no profit from fertilizers, limited working capital, and confusion over identifying the private sector customer entities, these units no longer deal in fertilizer. The factories were then left with continuing sales to state farms in large bulk quantities by road, rail, and barge, selling through some Romcereal units to both commercial and family associations, and selling directly to small farmers who took delivery of small lots directly from the factories. Some factories have established retail outlets at the factories, but the effectiveness of these is obviously very limited. As shown below, sales from the Turnu factory (a typical large, integrated fertilizer production complex) in 1993 and 1994 reflect the impact of the distribution and price changes:

	1993	1994
Sales to state farms	50%	^a
Sales to Romcereal	20%	65%-70%
Cash sales to associations	30%	30%-35%
Cash sales to small farms		5%

a. Included in sales to Romcereal.

The re-introduction of subsidized fertilizer for specific crops under Law 83 in the autumn of 1994 has shifted the responsibility of distribution of fertilizer to Romcereal. However, very little physical movement of fertilizer takes place through Romcereal. Rather, Romcereal administers the issuing of "Delegation to Pick Up Goods," i.e., delivery orders, stating product(s), quantities, and name of farm or farm association. Romcereal was allocated funds to allow free fertilizer allocations up to 40 kg nutrients/ha for autumn plantings and 70 kg/ha for spring applications for designated crops. Conditionalities include use of certified seed, proof of cropping intentions, and sale of 40% of crop output to Romcereal at the standard procurement price.

It would appear from the above Turnu factory data on fertilizer sales for 1994 that the benefits of the scheme have been derived essentially by the state farm and commercial association sectors and that it has had little impact on family association farms or small private farms. In part, this may be due to lack of knowledge of the scheme, the private farmers' aversion to dealing with the bureaucracy, anticipated low prices, and late payments from Romcereal, and, in the case of small independent farmers, inability to organize pick up from fertilizer factories, and the lack of surplus grain for sale to Romcereal. The GOR policy is to make this subsidy available to all farmers; but, in practice, it is perpetuating the more favorable treatment of state farms and legally recognized commercial associations.

The buoyant export fertilizer market in 1994 has allowed all factories except Arad, in the west, to export urea, diammonium phosphate (DAP), and some ammonium nitrate. The Arad factory is now closed and all complex fertilizer (NPK) factories have not operated in 1994; limited domestic complex fertilizer sales have been made from stocks. The Ministry of Industry is planning to use the facilities at Arad as a regional warehouse to ensure supplies of fertilizer in the west. This plan may be deferred until the recommendations of a total industry restructuring study for the World Bank and an EC-PHARE study on commercializing and privatizing three individual factories are available in early 1995.

All of the fertilizer companies are establishing small domestic marketing departments with the intention of establishing distributors/retailers of fertilizer. It is not clear whether such distributors will be aligned to existing quasi-privatized enterprises or to private entrepreneurs, or both. Already, informal distributors and retailers of fertilizer are operating, for example, state

farms buying additional supplies of fertilizer and reselling to the private sector with about a 15% markup.

Seeds

SemRom and Unisem, the parastatals responsible for production and distribution of grain and technical seeds (SemRom) and vegetable seed, vine and orchard stock (Unisem), now operate as commercial societies but continue to control the production and distribution of seed and the import and export of seeds through their association with the Ministry of Agriculture and Food, which issues licenses. It was reported that private sector seed companies and two international seed companies – Pioneer (United States) and Zeneca (United Kingdom) – are operating freely in Romania. It was reported that Romania is not complying with international treaties on seed phytosanitary testing which place the onus on exporting countries to test seeds. Also, in reality, there is no credit available for seed imports due to the requirement for immediate and equivalent lei deposits; all imports have been made on a consignment basis by the international companies. Private sector importers also face many restrictions with regard to import licenses and permits which do not apply to state trading enterprises. Combined with the absence of viable national or regional distributors, importers have had to deal directly with the state farm sector as this has been the only recognizable and identifiable market segment. Technology development is also being hindered by a requirement for a 3-year testing program for new seed varieties before issuing import licenses.

Pesticides

The domestic pesticide industry remains fully under state control. Product quality and choice is reportedly very substandard and again factory distribution systems have not changed since 1990 with a bias towards supplying the state farm sector. Importers are penalized by the bureaucratic controls which do not apply to state trading enterprises and the necessity to sell on consignment because of the lack of working capital in the few private distribution companies.

As a result of the difficulties facing importers of seeds and pesticides, Zeneca (United Kingdom) is reportedly withdrawing from the market in Romania and only Pioneer (United States) and Hoechst (Germany) and Ciba Geigy (Switzerland) will continue to offer imported technology with their markets restricted essentially to the state farm sector. EC-PHARE has

proposals for projects to provide technical assistance for the privatization of both seeds and pesticides.

Machinery

The GOR has provided subsidized credit for farm machinery purchases by the state and private farm sectors but has only privatized one of the 610 Agromech enterprises. Since 1990 it was reported that about 60,000 tractors had been sold mainly to the private sector with subsidized credit. The equipment owned by the Agromech enterprises is old and service reliability is poor. It was reported that the charges for machinery services by the Agromech enterprises were too high for private farmers. About 100 private sector machinery suppliers are operating, mainly providing spare parts, servicing, and some contract services. RomAgra imported Case brand farm machinery but was unable to sell it due to lack of farmer purchasing power and has had to resort to leasing and the provision of contract services. A study by the Ministries of Agriculture and Industry indicated an immediate need for about 80,000 more tractors, but the ability of the private sector to purchase was limited to less than 20,000/year. Small-scale mechanization equipment (for example, tillers) is not readily available and yet it would appear that there is a large market opportunity for this type of equipment for the small-scale farms.

Credit

Various subsidized credit schemes have been a government policy feature since 1990. During 1994 subsidized credit at 15% annual interest rates (obviously a negative real rate) was made available for all farmers for the purchase of inputs for autumn plantings. This credit supply was subsidized from Central Bank profits until the end of 1994 and will be subsidized through budgetary expenditures in the future. The Central Bank reported that most of this credit was utilized by state farms and commercial associations as private farmers were not accustomed to dealing with the banks and bureaucracy and were unable to meet collateral provisions. Such constraints mitigate against the stated policy of treating all farm sectors on an equal footing and point to the need for property rights and tangible guarantees. A legal status for family associations is also essential.

The Delivery of Technology and the Role of Producer Associations

Romania is reported to have excellent agricultural research capability but has failed to translate the technology through to farmer adoption due to shortcomings in the extension services and the nonseparation of the control functions of the Ministry of Agriculture and Food from its extension service. Claims are made that the extension service is now organized to serve the private sector but no evidence of this was observed.

It is well known that a significant role can and should be played by both private sector suppliers of agri-inputs and producer associations in technology transfer to farmers, supplementing the role of the official extension services. A study has recently been completed by EC-PHARE on the extension services highlighting technical, organizational, and operational constraints of the extension services in addition to identifying other agricultural production constraints.

The first strictly private producer association has already been formed, the Romanian Private Livestock Producers Association (ARCA). Interest arose among private livestock producers in forming ARCA in late 1993 during the USAID-funded emergency feed supplement importation project. Its formation and operation were supported by IFDC as part of the technical assistance component of the project. The membership of ARCA is currently about 150, and it is claimed that these members account for approximately 25% of private sector swine production and 15% of private sector poultry production. A recent membership recruitment project in which 400 producers were contacted failed to increase membership despite low membership fees. This lack of interest is probably because ARCA has few immediate tangible benefits to offer to prospective members. As a consequence, financial constraints limit the activities of the association. The direct and indirect support provided by the USAID-funded emergency feed supplement project is now concluded and ARCA will have to secure additional income to continue its activities.

The Board of Directors of ARCA has seen government lobbying as a significant activity particularly in the area of securing subsidized credit for the private sector. In addition, some commercial activities such as securing supplies of feed supplement for members have been attempted to supplement income for the organization. Lobbying for specific concessions and

entering into commercial activities change the nature of the organization and detract from its value in providing members with technical assistance. Continued financial and technical support and fostering of ARCA will be required if it is to survive as an effective technical assistance organization. Unless it can provide tangible assistance to its membership, it may well be transformed into a trade association. Certainly the Board has many very commendable ideas and current activities for assisting members such as assistance with business plans for credit applications, market information services, networking with domestic and foreign feed supplement suppliers, a newsletter, veterinary advice, and the conduct of seminars and field days to diffuse technology.

Current Policy Issues on Farm Inputs Supply and Use

The year 1994 represented a significant turning point in the transition process for the Romanian economy after 4 years of decline due to the partial dismantling of the centralized economic controls. Significant factors for the turnaround were (1) monetary policies which significantly decreased inflation by stabilizing the value of the Romanian currency and decreased the uncertainty in the Romanian marketplace, (2) favorable weather conditions which led to increased agricultural crop production for the first time since 1989, and (3) an increase in manufacturing output leading to some improvements in the external balance of trade. Macroeconomic results in 1994 exceeded International Monetary Fund (IMF) targets, but progress on privatization and the implementation of commercial laws has been slow.

Romanian policies for reform in consultation and in accord with the IMF include, along with other things (1) decreasing inflation from an annual rate of 75% in 1994 to 30% in 1995, (2) decreasing the current account deficit, (3) creating and maintaining a free foreign exchange market, and (4) accelerating the privatization process and the reform of bankruptcy, securities, and competition laws. The independence of the Central Bank has been actively supported by the IMF and now seems to be assured. The importance of this cannot be overemphasized in its impact on the stability of the economy generally and monetary and credit controls in particular. Without a decrease in inflation and improved exchange rate (ER) stability, the required domestic and foreign investment will not occur and the credit supply to agriculture for farm and agribusiness enterprises will continue to be one of the major constraints to improved

output. As inflation and ER stability is strengthened, a careful relaxation of the credit constraints, combined with fiscal reforms designed to stimulate the economy, may become desirable and perhaps necessary to facilitate economic recovery. But, at this stage, further control of inflation and stability of ER are of critical importance.

Several contradictory and conflicting policies still exist as constraints to the development of open competitive markets in the supply of farm inputs which is essential for improved productivity in the agricultural sector. A listing and brief discussion of the key issues and specific policy recommendations follow:

1. Inflation control is being exercised by the Central Bank in a sound manner, but the notion that further control can be exercised by fixing prices is not conducive to market development. All prices have to be effectively and permanently decontrolled so that competition can act freely to contain prices and a market economy can develop. At this stage, market development is distorted in all possible ways.
2. Social security safety net policies for the urban poor should be in the form of direct assistance and not through the lowering of basic food prices which constrain incentives for increased farm production and efficiency in food processing. Food processing subsidies and price fixing should be replaced by targeted welfare assistance for the urban poor.
3. The structure of the farm population and its organization are, at this time, murky. This creates uncertainty for all agribusiness and reinforces the need to expedite the cadastral survey, issuing of land titles, and a legal entity framework for family associations and the planned agricultural census.
4. Although approximately 80% of agricultural production is now reportedly "controlled" by the private sector, much of it is organized in a fragmented or loosely consolidated manner and the farming operations are not based on full ownership. The farm input supply and farm output marketing remains in the state sector parastatals and enterprises that are not established or attuned to dealing with the needs of the private sector in a competitive and efficient manner.

5. Autonomy has seemingly been given to most state enterprises serving agriculture but central control and administration structures have not been dismantled and their continued presence allows continued ad hoc market interventions, the source of extreme uncertainty in the marketplace.
6. Although sincere efforts have been made to treat both public and private sectors equally, for example, in the supply of subsidized credit and fertilizer, institutional arrangements are not in place for equal and equitable delivery of inputs and services to the private sector.
7. Restructuring and/or privatization of agribusiness enterprises has been virtually nonexistent to date and technical solutions to the privatization of organizations such as Romcereal are not apparent even though the GOR has agreed in principle to privatization.
8. Although import and export controls of farm inputs have been relaxed and opened to the private sector, bureaucratic controls and licenses and constraints on the credit supply to private importers are impeding the free trade in inputs and technology and the alignment of the Romanian farm sector with international trade.
9. Although the GOR policy is to encourage the development of private professional and producer associations, the only producer association formed to date (ARCA) requires additional assistance and development. Development of these organizations as representatives of subsectors has a role in diffusion of technology through inputs, services, and the extension of knowledge. As genuine representatives, such associations have a valuable and viable role to play in presenting private sector viewpoints to government.

Specific Policy Recommendations

The IFDC recommends the following specific policies for implementation by GOR:

1. Agricultural price interventions for wheat, meat, and milk should be removed and replaced with targeted welfare assistance for the urban poor.

2. A price stabilization scheme should be introduced for the major cereals based on import parity prices combined with seasonal incentives in which the government would act as a buyer of the last resort from any party, including Romcereal. Romcereal would be compensated for administering and storing government grain stocks separately from its commercial transactions using bonded warehouses/silos.
3. Privatization of Romcereal is not recommended at this time. Its immediate restructuring, however, is recommended to promote a more competitive grain market. This restructuring should be based on completely autonomous judet level organizations free to set their own seasonal and grain grading prices for buying, selling, drying and storage, and freedom to set employment levels, implement cost decreases, and take responsibility for overall management.
4. Restructuring of Romcereal should be accompanied by recapitalization of each autonomous organization and the offering of technical assistance in competitive business operations. All subsidies to Romcereal should be removed. Access to credit should be only at commercial interest rates with complete financial responsibility.
5. Those Nutricomb facilities that are potentially competitive should be completely privatized during 1995.
6. It is envisaged that Romcereal and Nutricomb will develop competitive grain buying and selling activities utilizing private sector traders to access the private farm sector. The organizations should be allowed to undertake these responsibilities but with complete financial responsibility.
7. The current subsidized Romcereal fertilizer scheme and subsidized credit program should be withdrawn after the spring 1995 cropping season and all subsidies for farm inputs phased out by 1996. Access to farm input supplies is more critical than their cost. Therefore, positive steps should be taken to encourage the pervasive development of farm input distribution systems by the private sector in competition with the autonomous Agricultural Supply Units, whose state-conferred monopoly powers and subsidy advantages should be eliminated to encourage the development of the private sector.

8. The Agrimech enterprises should all be privatized during 1995 by auctioning all equipment for either vouchers or cash. Equipment should be auctioned as individual units allowing private sector potential buyers, including current employees, to freely accumulate desired inventories of farm machinery and repair parts which can then be used to provide competitive farm mechanization services. Purchases by state farms or farm associations is also an option/alternative.
9. Consideration should be given to providing a legal entity framework for family associations so that beneficial impacts from these informal associations can be derived.
10. All available resources should be made available to complete the cadastral survey, issue land titles, and establish a land market. Combined with the macroeconomic reforms to contain inflation, this action will provide the collateral requirements for access to commercial credit.

Recommended Support Programs to Stimulate Economic Development of Small Private Sector Farmers

The lack of services aimed specifically at the small independent private farmers and family associations is typical of the evolutionary transition stage from a centrally planned agricultural sector to an open competitive market. IFDC experience in other transforming economies has highlighted the need for ongoing support of the evolution of policy actions and steps which are consistent with the overall policy framework. The provision of technical assistance to foster the emergence of competitive private sector entrepreneurs to provide marketing services to the small farmer community is central to stimulating economic development in the agricultural sector. This process is highly suited to a development aid project. This type of project is currently not being addressed in Romania by the donor agencies. It is therefore strongly recommended to USAID/Romania that tangible assistance in support of small private farmers should be provided by projects tied to quantifiable policy benchmarks for the disbursement of subsequent tranches of grant funds.

Specifically, a project designed to foster the development of entrepreneurs who would be engaged in the supply of farm production inputs (feed, fertilizer, plant protection products, machinery, and technology) is urgently needed. The development of a private agri-inputs sector is central and essential to the process of linking the farm family with the sources of supply of production inputs and services. Also, the private inputs supply sector can play a dynamic role in linking the farmer with markets for surplus production.

The project should focus on the provision of technical assistance designed to strengthen the emerging private agri-inputs sector to enable it to provide products and services to the private farm sector. A high priority should be given to developing the agri-inputs distribution systems and to expand the marketing services offered to the private farm sector by the former state enterprises and the emerging agribusiness entrepreneurs.

Furthermore, the immediate implementation of a project to foster the development of a private agri-inputs marketing sector will help to focus attention on the constraints to development and thus hasten the implementation of GOR policy reforms designed to facilitate the privatization/market reform process.

Programming Romanian Cadastre Funds From the Commodity Import Grant Agreement (CIGA)

Public and Private Cadastres

There are at least six cadastral surveys being conducted by various ministries in Romania. However, the most important concerns surveying land parcels to grant land titles and is being conducted by MAA. It is important to note there is a law under discussion in Parliament (Lege Privind Cadastral General) that would place all cadastral surveys under the same agency who would be responsible for any special cadastre.

Originally, there were about 20-25 million parcels of land to be surveyed. It is also estimated that there will be about 5 million people in Romania who will own land eventually. However, to allow roads, easements, liens, and the associated provisions for providing access to small parcels of land, it is now estimated that there are more than 50 million parcels to

survey, more than double the original estimate. It is expected that 6 to 10 years will be required to complete a survey. The cadastre will maintain three types of registers; an alphabetical list of owners, a list of parcels showing ownership, and a list of owners showing each parcel owned.

There are numerous opportunities to begin to privatize the surveys and donor agencies and some ministry personnel view the possibility favorably. There are two basic types of survey programs in Romania, those associated with the land law and those associated with the cadastre. The implementation of the land law allows for private companies to be involved. This law deals with recovering land owned previously, including measurement and granting a clear title but the law does not cover all properties. The cadastre deals with all properties, and the current law specifies this must be done by the GOR. The cadastre is important to the GOR because it provides a basis for taxation.

There are about 4,500 MAA employees involved in the cadastre, but MAA estimates 10,000 are needed. There are plans to hire a large number of contract employees to supplement the MAA staff. Assuming that 20%-25% are surveyors and engineers, at some point there will be a large trained cadre of private surveyors. In addition, many of the ministry personnel involved in the current cadastres would likely be willing to work for private firms, especially if wages were attractive or more workhours per week were offered.

There are a few privately owned small surveying and engineering firms with three or four employees in Romania with very limited experience. Many of the employees work at full-time jobs and work in private firms to supplement income. However, there appears to be a large number of engineers that are underemployed that would be interested in surveying work.

The major problem for private firms in Romania is the cost of equipment. To buy a total station (theodolite), vehicles, printers, plotters, and other essential equipment and supplies could cost 50 million lei (\$81,300), and with a 50% or higher interest rate, the number of firms that can afford such costs is minimal. Credit is very difficult to obtain because most firms have limited collateral, perhaps only a vehicle. Thus the amount they can borrow is extremely limited. Some type of donor assistance is needed to enable small firms to obtain adequate credit and to encourage their growth and development.

Because few Romanian firms have experience in surveying, it will be necessary to select and screen firms that are credible and reliable. Perhaps test results could be one criterion for selection. A group such as the National Society of Professional Surveyors in the United States might be used to develop the criteria and recommend firms that should be given contracts for surveying and financial assistance. There are a number of engineering companies in the United States that would likely be willing to help with the surveying. It is possible that they could be used to help train Romanian firms or work in joint ventures by supplying both equipment and expertise. One U.S. engineering firm has already made a proposal to select 40-50 control points in Albania at \$1,350/point in the control grid. Something similar could be done in Romania and gradually allow more and more involvement of private Romanian firms.

The following points should be considered to assist in the privatization of the surveys.

1. A donor agency such as USAID should encourage the MAA to contract nonministry professionals to conduct the surveys. A donor agency might have to supplement part or most of the cost of hiring private surveyors.
2. A firm or organization should be selected to evaluate the capabilities and credentials of the privately owned engineering and surveying firms currently operating in Romania and recommend those appropriate for the MAA to contract for survey work. This same firm or organization could be used to evaluate the potential of new firms and to develop the criteria to determine which ones are qualified.
3. Loans, grants, or bank guarantees may be made by a donor agency to credible privately owned Romanian firms owned by or staffed with reputable individuals who have the necessary training and skills to purchase the equipment needed to participate in the surveys.
4. Grants could be provided to U.S. firms to survey control points in the control grid based on a set fee and to perform some of the more difficult surveying jobs until Romanian firms gain more experience.

5. Grants should be made by donor agencies to U.S. engineering companies to help train Romanian firms involved in the cadastral survey. The grant could provide an incentive on the number of tracts that are eventually successfully surveyed by the Romanian firm. The U.S. firm could be encouraged to form joint ventures with the Romanian firms and still earn incentives for a specified period of time.
6. Work constructively with the Romanian Government to improve the current cadastre law so private surveys would be permitted. The cadastre law is currently being debated in parliament and will likely be changed sometime in the future, but the way it will be changed is very uncertain as many amendments have been offered.
7. A company or organization should be hired to analyze and develop these and other related ideas that have merit and make specific recommendations on how to implement them as rapidly as possible to privatize the land and cadastral surveys.

The Role of MAA

The MAA has been authorized to implement the CIGA based on letter No. 105649 dated December 9, 1992. An agreement was signed between the MAA and the MOF on April 15, 1993. This agreement describes how the program is to be conducted and the responsibility of each ministry. The MOF has delegated the full authority and responsibility to the MAA for implementing the CIGA. The MAA will provide the MOF with (1) copies of information sent to USAID within 48 hours, (2) a report on each step of the project, (3) a report summarizing activities during each quarter, and (4) a report on any modifications to the project within 4-5 days. The MAA is also to confirm to the MOF that the funds in foreign and local currency resulting from CIGA have been used in accordance with the provisions of the agreement, together with justifying reports and auditing documents.

The Role of MOF

The MOF shall provide financial supervision for the project. The MOF has an account with the Banca Agricola. The minister has informed USAID in a letter dated February 23, 1993, that this account is a separate account numbered 64.26.01.60 and is a non-commingled, interest-bearing account to receive local deposits in lei from the auction of the feed supplement under

the CIGA. Purchases of equipment and supplies for the cadastral survey will be charged to this account.

According to Section 3.1 of the MAA/MOF agreement, the disbursements in lei from the special account will be made only with the approval of the MOF, after the confirmation of USAID that the MAA has fulfilled its obligations. Also according to Section 2.1 of the MOF/MAA agreement, the MOF must agree in writing on how the funds are used.

The Role of IFDC

IFDC will provide support to the cadastral survey in the areas of programming, budgeting, and the development of a reporting and evaluation system. Equipment and supplies to be purchased have been identified. A budget will be developed and submitted to USAID by the MAA as soon as approvals for these items are received from the MOF and USAID. A system of evaluation and reporting is being developed jointly with the Directorate of the Geodesy and MAA personnel. The main contact of IFDC has been the Directorate of the Geodesy. An organization chart showing the units of the MAA involved in the cadastral survey is shown as **Figure 10**. The Directorate of the Geodesy conducts the surveys and requires equipment and supplies for the cadastre. The Directorate of the Cadastre documents the work and maintains the cadastre registry. IFDC will assist the Directorate of the Geodesy in the preparation and submission of reports on equipment purchases.

Role of EC-PHARE

The EC-PHARE (European Community, Poland, Hungary, Albania, Romania, and Estonia) program is not a part of this program but has been a major donor for the cadastral survey. Their equipment was procured by developing a short list of suppliers and competitive bidding. The equipment was imported from EU member countries and did not use lei. The bidding was managed by EC-PHARE and not by the MAA.

EC-PHARE purchased 170 total stations (theodolites) and 42 model 386 computers. This equipment was purchased in 1991, but most was not received until 1992. In 1992, 42 plotters, 42 digitizers, 100 additional theodolites (similar to the 170 bought previously), and 2 pilot graphic stations were purchased. EC-PHARE also provided technical training for 200 persons.

Approximately \$5.3 million of equipment has been imported under the EC-PHARE program and an additional \$5.8 million in 1993.

Current Programming and Budgeting in the MAA

Procurement of Equipment and Supplies – A list of equipment and supplies required for the cadastre was developed jointly by the General Directorate for Land, Cadastre, Geodesy and Land Management; the Directorate of the Geodesy; and the Directorate of the Cadastre. The EC-PHARE project has already purchased many of the items from the original list. The remaining items are needed and will be purchased with the auction funds. The items proposed for purchase by the MAA have been discussed with EC-PHARE representatives and, in their judgment, there is no duplication.

USAID has not approved the purchase of vehicles that are not made in the United States and foreign procurement requires special approval. USAID has indicated that salaries for specialists, topographers, surveyors, mappers, specialists from local government, and day laborers could be paid from these funds. The MAA has indicated that these funds will not be used to pay MAA employees, but will be used to contract employees to supplement the MAA staff.

Of course, MAA considers vehicle purchases a high priority and one vehicle is needed for each total station. The MAA has 1 billion lei in counterpart funds from EC-PHARE donations such as commodities and spare parts. It is reported that the Deputy Prime Minister has approved vehicle purchases with these funds. Plans are to purchase 300 Romanian ARO 4-wheel drive vehicles if USAID does not allow vehicles to be purchased with auction proceeds.

The Directorate of the Geodesy has indicated the priority items for purchase which are shown in **Table 26**. A list of items has been developed in case the feed supplement funds cannot be used to purchase vehicles (**Table 27**). Additional items given priority, assuming no purchase of vehicles, are shown in **Table 28**.

In addition to the \$8.5 million in the CIGA allocated for the purchase of feed supplement, another \$1.5 million was allocated to GOR to ensure economic assistance with the global positioning system to be used with the cadastral survey. However, as part of this agreement,

data had to be released on various grids and coordinates. So far, the military has been unwilling to share this information.

Current Controls

Government Decrees and Regulations – A number of government documents have been provided by MAA regarding the purchases of equipment and supplies. All documents concern general procedures for importation with foreign currency. Procedures and policies have been established generally by government decree, but purchasing procedures through tenders with Romanian currency have not.

Resolution Number 1/394 dated February 27, 1991. This document outlines import procedures, competitive bidding rules, the roles of the Commerce and Industry Ministry, the Ministry of Commerce and Tourism (Foreign Trade Department), the National Bank of Romania, and eligibility for auction participation. The document also outlines procedures for obtaining foreign currency and procedures on competitive bidding with at least three suppliers. Establishing a competitive climate, including transparency of operations and efficiency, is stressed.

Resolution Number 8 dated October 1, 1991 and signed by Secretary General Nicolae Olteanu. This resolution outlines procedures for obtaining hard currency required for importing goods mentioned in the materials balances for commercial companies. Bids should be chosen competitively by selecting a sole importer from no less than three competitors. The document states that reliability, price, market and credit conditions, product quality, delivery conditions, and certainty in realizing and fulfilling the import operations should be the criteria. Selection of bidders is by the Domestic Trade Department from Tourism and Trade Ministry. Bidders should be registered at the Chamber of Commerce and the Register of Commerce and have an account at a Romanian bank.

Current Procedures

Method of Procurement – General purchasing procedures have been established for importing goods with tenders and foreign currency. However, detailed procedures have not been established for tenders for the purchase of goods using local currency because previous grants have involved foreign exchange and are unlike procedures using proceeds from the auction.

Methods of Inventorying Capital Expenditures – The MAA has a centralized inventory and assigns an inventory number and a room number to every item. A record card is completed for each item which includes a debit and credit form and a portion devoted to repairs required. All equipment that is purchased is signed for by a receiving person and when the equipment is assigned to an employee for use in their job, another agreement is signed by the person supplying the equipment and the recipient. As part of the agreement the recipient agrees to notify MAA in writing about any damage or loss and to return the equipment upon termination of employment.

Control of Expendable Supplies – The MAA maintains a registry for expendables very similar to the register for capital expenditures.

Methods of Assigning Equipment to Districts – A contract is made between the MAA in Bucharest and the director of each judet office stating that the obligation of the MAA is to identify and supply the equipment, provide assistance for 1 year, provide instruction and training on use, and checking if the equipment is used rationally. The receiver agrees to properly register, transport, store, handle, and use the equipment so as to maintain the technical specifications described in the contract. The receiver also agrees to observe the work instructions and report any problems, to provide reports on the equipment use and the results obtained, and to return the equipment to MAA at the end of the contract.

Signature Control and Authorization

The MAA will make a quarterly report to the MOF concerning implementation according to the MAA and the MOF agreement signed April 15, 1993. The MOF/MAA agreement provides the following names as authorized for communication for the MOF: Mr. Mihai Bogza, General Director, International Financial Directorate; and Mihai Giuvelea, General Director, Public Debt General Directorate.

The agreement indicates the following officials have received authorization from the MAA: Alexandru Lapusan, Secretary of State, Chief of Coordinating, Strategy and Reform in Agriculture and Food Department; Viorel Davidoiu, General Director, Directorate of Livestock Orientation; Gheorghe Creineanu, General Director, General Directorate of the Geodesy, Cadastre and Land Cadastral Survey.

Specific Forms

There are several forms used by MAA to inventory the items purchased and to ensure control. These include:

- **Record Card for Capital Expenditures (Fisa Analica Pentru Myloose Fixe)** – This includes the item name, brand, series, approval date received, value, accounting notes, and a record of capital repairs.
- **Capital Expenditures (Receptions Note and Establishing of Differences)** – This includes a document number, a supplier code, a receiver code, an order number, an invoice number, a creditor account, and the number of items purchased. Also included are a debtor account, the quantity, the price per unit, the receiving value and any rebate, the signature of the member of the reception committee, the date received, and the date received in the financial administration offices.
- **Invoice** – This contains information concerning the supplier, a delivery code, a receiver code, and the contract number. The document shows what was sent to MAA, quantity, price per unit and the total value of all units of each product, and the total value of all units of all products. The form also shows the beneficiary, the bank of the beneficiary, code number, total payments, date paid, authorizing signatures, and the signature and stamp of the issuing unit. Details concerning the purchase may be attached as annexes including technical features, accessories, and prices.
- **Process – Verbal** – This is a document that assigns responsibility for an item to an employee. The form documents the building and room where the equipment is located. The employee signs a statement accepting responsibility, agrees to report damages immediately and indicates to whom and identifies where the item must be returned should the employee leave the job. The person delivering the item and the person receiving the item must sign the document.
- **Centralized Inventory** – This is a form for each type of equipment which shows the identification number, the equipment location, and to whom the equipment is assigned.

- **Contract With the Districts** – This is a contract that is signed between the MAA and each district for the measuring equipment and computers. It sets forth the responsibilities of the MAA and includes registering the equipment, guarantees, providing instructions, and checking for faulty use. The judet agrees to take responsibility for the equipment, to register it in the capital expenditures account, taking proper care, reporting malfunctions, reporting on usage, and delivering the equipment back to the Ministry at the end of the cadastral survey. This system was used successfully for the equipment purchased with the EC-PHARE funds.

Adequacy of Controls

It appears that sufficient controls exist in MAA for the cadastre program to work well. One of the greatest problems is lack of experience with this type of program and particularly with procurement. The program most closely related to the CIGA program that has been conducted successfully is that of EC-PHARE. Although procurement in the CIGA program is quite different, there are many other aspects of control that have worked successfully in the EC-PHARE program.

Procedures and Processes of Budgeting – The process of budgeting and determining what is needed is done by those in charge of these activities. There is no duplication of the EC-PHARE spending of the cadastral survey and the original list of equipment and supplies has been reviewed by EC-PHARE personnel and they are in agreement. The list has not been changed in any major way since their review except for the question of vehicles. The list needs to be approved in writing by the MOF according to the April 15, 1993, MAA/MOF agreement.

Accounting – Detailed accounting records are maintained by the MAA. However, the most useful items for accounting for the funds will be the separate bid awards, contracts, invoices, and monthly financial records supplied by the bank. The records needed to audit the accounts have been discussed with Coopers and Lybrand (CL), and they have reviewed the recommendations.

Procurement – There are general procurement procedures that have been adopted using foreign exchange, but procurement procedures using lei and competitive bidding do not exist. Several recommendations have been made for adequate control.

Inventory Control – This is the strongest capability of the MAA and one of the most important. Every capital item is inventoried and someone is held accountable until it is assigned to an employee. There is also a registry maintained at the MAA for consumables received. The purpose of this is to ensure that all expendable supplies that are purchased are accounted for properly and a record of delivery is maintained. The person receiving the delivery signs for the supplies. However, there are no individual assignments of responsibility, as with capital items, because this would not be practical. The current system should ensure adequate inventory control.

Monitoring – Most of the experience in monitoring has been with the EC-PHARE program which has completed a major effort to ensure that field personnel are trained well in the use of the new cadastral survey equipment and technology. The Directorate of the Geodesy has stressed that the equipment is loaned to districts, and that if it is not used it will be transferred to another district. However, so far the need has been for additional equipment; the problem is overuse and not underuse. Most of the equipment and supplies is not highly technical and field personnel will be familiar with use. In general the equipment and supplies will be used to support an effort that is already being monitored well.

Auditing – Coopers and Lybrand (CL) have indicated that financial documents required for an audit will be available through current procedures. Financial records will also be available from the bid awards, contracts, letters of receipt, and invoices.

District Cadastres – A district will sign an agreement with the Ministry to maintain equipment and report any damage. Technically the equipment is being loaned to the districts. Title to all equipment belongs to the MAA, but the district assigns responsibility. There is also a record maintained of all expendable supplies. However, no one is assigned responsibility for expendable supplies.

Procurement Constraints

Ideally, purchases should be made with payment on the date of delivery. However, most Romanian firms have a serious cash flow problem and request payment in advance. In some cases they may receive partial payment at the time the contract is signed, a portion in 30 days, and the remainder upon delivery.

The value of the lei has been declining rapidly. For example, the exchange rate was 530 lei per dollar in February 1993 and had declined to 615 lei per dollar by May 1993, and 1,700 in mid-December 1994. This is the result of a weak economy including balance of payments problems and inflation rates of 70% or more per year.

Romanian firms maintain a limited stock of goods. As a result it may be that suppliers will submit two different bids in the tenders using two different strategies. One for the goods in stock with payment at delivery as specified in the tender and an alternative price and conditions (which will be exceptions to the tender) for delivery a month or 6 weeks from the tender date.

Vehicle manufacturers may not agree to sales to be bid in lei prior to delivery date without payment in advance. They may insist on bids in lei at the time of the auctions subject to adjustments based on changes in the lei value at time of delivery compared with time of bid. It may be that the factory can supply only 20-30 vehicles per month, so delivery could be over an extended time period.

There are some items that are not sold normally in Romania. For these technical and specialized items that may be produced by only one firm, it may not be possible to obtain bids. It may not be possible to get firms to offer prices c.i.f. Romania. In this case the item has to be priced ex-country and a separate price obtained from an importing company in Romania that can arrange freight and delivery.

It appears that the manufacturer of the folex sheets has only an "advertising representative" who has no authority to negotiate and is the only person who can take orders for this product. The manufacturer will not ship the product without advance payment. Importing is cumbersome in Romania because it takes time for commercial companies to change lei into dollars. The second problem is that transport companies in foreign countries will delay shipment until a truck is completely loaded. The goods ordered by the Romanian company will be delayed until a truck bound for Romania is loaded fully.

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There is no unique solution for each of these problems. However, using the funds as quickly as possible after the auctions and conducting the tenders with delivery dates as early as practical would be wise. The problems associated with particular items can be addressed individually in the specifications. These problems have all received consideration in developing the following recommendations.

Recommendations

1. The MAA should obtain a list of recommended items to be purchased approved in writing by the MOF.
2. Detailed specifications should be developed for every item to be purchased. Specification should include size, color, weight, thickness, packaging, length of warranty or guarantees if applicable, technical considerations, delivery location, service to be provided, provisions for rejection, quantity desired, and training requirements. Specifications should not normally include brand names.

Specifications should include a delivery date. This will be within 30 days of the award for most items, but this may not be reasonable for some items. Specifications should include payment terms for each item. Normal payment terms will be payment on delivery with no advance payment. However, for expensive items that are not available in Romania and must be imported, it may be that some payment will be made in advance to successful bidders. Any advance payments should include provision for recovery if delivery fails. The development of the specifications is the responsibility of the MAA. IFDC and a contracted accounting firm could review the specifications to ensure that adequate detail has been included.

3. Tenders to solicit bids and announcing tender dates should be placed in the major Romanian newspapers at least 3 weeks prior to the date bids are due and repeated approximately every 4 days. Announcement of tenders should also be mailed to reliable suppliers at least 2 weeks prior to the date the bid is due. General specifications should be included in the ads and detailed specifications in the mailings. The costs of advertising and tender notices should be paid from the auction proceeds.

4. All bids to provide supplies and equipment should be sealed. All bids should remain sealed until the date and hour specified for opening. All bids in the tender will be in lei at the time of bidding in order to match the auction proceeds. Thus the risk of the lei value declining before delivery will have to be built into the bids by the prospective bidders. Separate bids may be submitted at different prices for different delivery dates at each tender. However, bids that do not meet specifications, including delivery dates, may not be considered even if at a lower price. Bids at each tender can be submitted for different quantities. All bids will be valid for 1 month from the date opened until a contract is signed. However, every attempt will be made to make awards and sign the contract within 2 weeks.
5. There should be at least a 6-person committee to open the bids. This committee should comprise the Directorate of the Geodesy and another representative of the MAA, a representative of IFDC, two representatives of Coopers and Lybrand, and a representative of USAID. A smaller committee should evaluate the bids and make the awards. An award committee should consist of the Directorate of the Geodesy, a representative of IFDC, and a representative of Coopers and Lybrand.

Bids submitted for each item will be divided into two groups. The first group of bids will be those that meet all specifications, including delivery date. The bid will be awarded to the lowest bidder in this group. The second group of bids will be those that do not meet all the specifications.

If the lowest bid is valid for less than the total number of items tendered, the bids must be ranked by the bid committee. Remaining bids in the first group should be ranked according to price. The second group of bids for each item will be those that include one or more exceptions to the specifications. For example, the delivery date or payment terms could be an exception. Although price will be the main criteria for developing the ranks, other factors to consider are product quality and company reliability, market and credit factors, certainty of delivery, and delivery and payment conditions.

It may be that some of the exceptions to the specifications are very minor. The two groups of bids must be merged to obtain one ranking for each item. In this case the top ranked

bid in group 1 (meeting all specifications) should be compared with the top ranked bid in group 2 (not meeting all specifications). For example, a bid that has a delivery date 1 week later than that included in the specifications may be more acceptable than a bid meeting the specifications with a higher price.

In all cases the bidder who meets all specifications and submits the lowest bid should receive the award for the entire quantity for which the bid is valid, up to the quantity specified in the tender. However, if there are no bids that meet all the specifications or if the low bid that does is not valid for as many items as the tender specifies, the bid award and/or subsequent bid awards should be based on the rankings.

There should be at least three bids submitted for each item to be purchased. These three bids do not have to meet all of the specifications. If there are less than three bids, then all bids will be rejected and the item will be retendered. Letters should be sent to all known suppliers immediately inviting a new bid. The best bid at the retender will be selected using the previous bid award criteria even if there are only one or two bids. If there are no bids that meet all specifications, the committee shall determine if any of the bids not meeting all specifications will be accepted or if the item should be retendered.

6. As soon as the bids are awarded by the committee, contracts should be signed by the successful bidders with the Directorate of the Geodesy. If contracts are not signed and on file within 14 days after the bid is awarded, the bid may be awarded to the company which the committee then ranks as the best bid. A standard contract will be made available to all successful bidders by the Directorate of the Geodesy. The contract will include all the specifications for the item, including delivery dates and payment terms, and will specify penalties for nonperformance or incomplete performance.
7. All items for which tenders have been awarded should be delivered to the MAA in Bucharest and signed for by the Directorate of the Geodesy or a representative. No items will be delivered directly to districts unless agreed in writing by the Directorate of the Geodesy, MAA, CL, and IFDC. When the items are delivered they will be counted, inventoried, and checked for damage by the Directorate of the Geodesy. An acceptance letter will be signed by the Directorate of the Geodesy and returned to the supplier.

8. The agreement between MAA and MOF also states that all disbursements shall be made only with the approval of the MOF, after the confirmation of USAID that the MAA has met all obligations. When the acceptance letter is received by the supplier, the supplier shall send an invoice to the Directorate of the Geodesy for payment. The Directorate will authorize payment and send the invoice to the MAA representative that has been authorized by the MAA/MOF agreement. The MOF should authorize an order for bank payment after MAA and USAID have authorized the invoice for payment. Banca Agricola would then pay the supplier and debit the MAA account. All payments and transactions from the lei account should be in the form of checks or bank documents that can be easily identified. The authorized signatures should be sent to the president of Bank Agricola.
9. Banca Agricola should prepare a monthly statement showing all financial transactions debited or credited to the account and to whom they were made. A copy should be sent to the Directorate of the Geodesy, MAA; Coopers and Lybrand; and IFDC. A letter should be sent to the President of the Banca Agricola requesting this action.
10. Capital equipment assigned to a district by the MAA should be with a contract similar to that used in the EC-PHARE project.
11. IFDC or USAID and their representatives should have a right to inspect any or all of the equipment at any time. Both should have the right to request and receive within 24 hours a current list of all equipment that has been purchased and the location.
12. All capital equipment items should have an identification tag with a unique number that is not to be removed and is recorded on all documents.
13. The Directorate of the Geodesy should provide IFDC and USAID a monthly report on all equipment and supply items received from each supplier and the quantity of each item received to date. This should be compared with the quantity purchased. The monthly report should also include the amount paid from the Bank Agricola account and the balance in the account. An explanation of any differences from tender specifications, including delivery dates, will also be included. The monthly report should also include the

number of parcels that have been surveyed to date and the number of land titles that have been issued by district. A suggested monthly report form is shown in **Table 29**.

14. The Directorate of the Geodesy should provide IFDC and USAID with a list of all items purchased and the quantity of each item purchased and the location. This list should show total expenditure by item. If any items have not been delivered to the Ministry by that date, this should be noted.
15. The MAA should conduct an inventory at least once each year to check that the number of items in all offices agrees with the number originally purchased. The equipment should be monitored on a regular basis to ensure that it is located where it is needed and is being used properly.
16. The contract between IFDC and USAID stipulated that USAID would conduct the following complementary activities: (1) financial monitoring of the bank funds, (2) performing or contracting for an audit of the funds, (3) auditing any other account used to expedite the use of the feed supplement auction funds, and (4) auditing how the funds were actually used during the cadastre. These four steps are an essential part of the control process.

Problems and Issues

There were initial problems in convincing customs officials that the IFDC imported feed supplement was exempt from all duties, fees, and taxes as stated in the agreement between the U.S. Government and the GOR. This is a result of the terms of the agreement not being shared or understood at all levels of GOR.

A minimal amount of the feed supplement purchased by private farmers was resold to state farms. Such behavior is probably unavoidable and those who participated in the diversion were excluded from future purchases.

The approval for IFDC to work in Romania as a nonprofit organization was not obtained until April 28, 1994. The advantage of this legal status is that checks can be written by IFDC on the local currency bank account. The delay was cumbersome but unavoidable.

The GSM-102 program of the U.S. Department of Agriculture is contrary to the development of private animal production in Romania. The program provided about US \$52 million in credit for the GOR to purchase American soybeans. Following crushing, the meal is made available to enterprises owned by the state. Contrary to popular conception, the struggling private sector has little or no access to the meal and must compete with subsidized state enterprises. Thus, two policies are evident in Romania, one that attempts to strengthen the private sector and the other that supports state-owned animal production.

Furthermore, as the project approached conclusion, it became clear that the effort would not be sustained with funding from USAID. The project was clearly successful in introducing and creating a demand for and interest in high quality animal feed supplement. There is no disagreement on this point by anyone familiar with the project. As the project ended so did the supply of imported supplement. Those who produce swine on a small scale in the private sector are baffled and discouraged about the abrupt end to the supply of feed supplement. Thus, the project simultaneously encouraged and discouraged small scale producers. Succinctly, the project introduced a beneficial and attractive commodity that is currently not available in Romania, at least in the short and medium term. Undoubtedly, lack of quality supplement is a significant factor that contributes to serious financial problems of many private animal producers..

Table 1. Sources of Information About Seminars and Auctions as Reported by Participants^a

Source of Information	Number of Participants Citing Source	Percentage of Participants Citing Source
Television	302	53.0
Ministry of Agriculture and Food	133	35.0
Radio	101	27.0
Posters	97	26.0
Newspapers	100	26.0
IFDC letter	37	10.0
Friends	27	7.0
Banks	28	7.0
Other	4	1.0

- a. Respondents cited more than one source of information.
Percentages are rounded.
Data based on 380 respondents.
Data are for two pre-seminars and two auctions.

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Table 2. Participation in Pre-Auction Seminars by Location and Type of Participant

Location	Seminar Date		Farmers		Observers		Seminars 1 and 2		
	Seminar 1	Seminar 2	Seminar 1	Seminar 2	Seminar 1	Seminar 2	Total Farmers	Total Observers	Grand Total
Alexandria	May 29	-	6	-	7	-	6	7	13
Arad	May 24	-	44	-	12	-	44	12	56
Braila	May 24	September 2	34	29	14	6	63	20	83
Bucharest	May 19	August 27	65	28	39	3	93	42	135
Cluj	May 26	August 24	85	18	27	3	103	30	133
Constanta	May 21	-	83	-	13	-	83	13	96
Craiova	May 21	-	21	-	44	-	21	44	65
Giurgiu	May 17	-	43	-	25	-	43	25	68
Iasi	May 26	August 30	50	19	24	1	69	25	94
Total			431	94	205	13	525	218	743

Table 3. Types of Farm Ownership Represented at Pre-Auction Seminars^a

Type of Ownership	Pre-Auction Seminar 1	%	Pre-Auction Seminar 2	%	Total	
					Participants	%
Individuals	129	43	19	24	148	40
Non-judicial associations	24	8	5	6	29	7
Commercial societies	101	34	48	61	149	39
Agricultural associations	19	6	5	6	24	6
Others	18	6	-	-	18	5
Unknown	10	3	2	3	12	3
Total	301	100	79	100	380	100

a. Percentages are rounded. Data are based on completed questionnaires.

Table 4. Schedule and Locations for the First Auction Series of Swine Feed Supplement

Location	Venue	Date
Giurgiu	Hotel Steaua Dunarii	June 18, 1993
Bucharest	Academia de Stiinte Agricole si Silvice	June 21, 1993
Craiova	Facultatea de Agronomie	June 23, 1993
Iasi	Hotel Moldova	June 24, 1993
Arad	Universitatea de Vest Vasile Goldis Facultatea de Drept	June 25, 1993
Braila	Prefectura Judetului	June 26, 1993
Cluj-Napoca	Universitatea de Stiinte Agricole	June 28, 1993
Constanta	Casa de Cultura	June 29, 1993

Table 5. Quantity Purchased, Mean Price Paid, and Price Range for Swine Feed Supplement in the First Auction Series by Type of Farm Ownership^a

Type of Farm Ownership	Quantity Purchased	Lots Purchased	Mean Price Paid	Price Range
	(mt)	(10 mt)	(US \$)	(US \$)
Individuals	40	4	295	245 - 327
Non-judicial associations	70	7	292	216 - 314
Commercial societies	10,100	1,010	310	215 - 449
Agricultural companies	10	1	272	272
Total	10,220	1,022	309	215 - 449

- a. Prices are rounded to nearest U.S. dollar.
735 lei = US \$1.00.

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Table 6. Number of Buyers, Quantities Purchased, Mean Prices, and Price Ranges for Swine Feed From the First Auction Series by District

District	Number of Buyers	Quantity Purchased	Mean Price Paid	Price Range
		(mt)	(US \$/mt)	(US \$/mt)
Alba	2	180	258.14	239.52 - 299.40
Arges	3	480	272.34	251.49 - 335.32
Bacau	2	30	301.38	299.40 - 305.38
Braila	6	940	313.74	287.42 - 383.23
Brasov	1	40	266.67	257.48 - 275.44
Buzau	3	350	306.13	287.42 - 335.32
Calarasi	2	590	280.13	263.94 - 340.13
Caras-Severin	1	260	239.52	239.52
Cluj	3	470	237.49	216.76 - 263.47
Constanta	5	390	340.94	299.40 - 395.20
Covasna	1	30	247.49	221.55 - 269.46
Dambovita	1	10	287.42	287.42
Dolj	4	510	230.56	182.22 - 281.43
Galati	2	90	317.49	287.42 - 366.46
Gorj	1	10	253.89	253.89
Harghita	1	160	249.77	215.56 - 276.64
Hunedoara	1	10	269.46	269.46
Iasi	4	1,450	323.68	289.79 - 361.90
Ialomita	1	410	286.39	257.48 - 323.35
Mures	5	930	240.4	215.56 - 273.05
Olt	1	210	190.13	189.22 - 192.81
Prahova	3	490	294.48	189.22 - 299.40
Satu Mare	2	30	223.54	215.56 - 239.52
Salaj	1	10	215.56	215.56
Sibiu	1	10	245.5	245.50
Suceava	7	70	276.98	269.46 - 299.40
Teleorman	4	240	268.45	251.49 - 282.63
Tulcea	2	150	326.53	251.49 - 383.23
Vaslui	2	280	277.36	257.4 - 299.40
Vrancea	5	1,390	278.13	221.55 - 324.55
Total ^a	77	10,220	309	215 - 449

a. Total prices are rounded to the nearest U.S. dollar.

Table 7. Locations and Dates of the Second Auction Series

Location	Venue	Date
Cluj	Universitatea de Stiinte Agricole	September 28, 1993
Bucharest	Academia de Stiinte Agricole si Silvice	October 1, 1993
Iasi	Hotel Moldova	October 4, 1993
Braila	Prefectura Judetului	October 7, 1993

Table 8. Type of Farm Ownership, Quantity Purchased, Mean Price Paid, and Price Range for Swine Feed Supplement in the Second Auction Series^a

Type of Farm Ownership	Quantity Purchased	Number of Lots Purchased	Mean Price Paid	Price Range
	(mt)	(10 mt)	(US \$/mt)	(US \$/mt)
Individuals	60	6	606	519 - 628
Commercial societies	3,495	349.5	477	343 - 780
Agricultural companies	350	35	451	343 - 571
Total	3,905	390.5	492	343 - 780

a. Prices are rounded to nearest U.S. dollar.

Table 9. Number of Buyers, Quantity Purchased, Mean Prices, and Price Ranges for Swine Feed Supplement From the Second Auction Series by District

District	Number of Buyers	Quantity Purchased	Mean Price Paid	Price Range
		(mt)	(US \$/mt)	(US \$/mt)
Alba	2	70	432.07	352.56 - 491.72
Bucharest	1	250	534.35	438.03 - 580.12
Bacau	1	30	534.18	534.18
Braila	3	385	499.09	405.98 - 802.35
Buzau	2	360	508.06	352.56 - 545.94
Cluj	1	200	532.58	440.17 - 619.65
Constanta	1	50	534.18	534.18
Covasna	1	240	409.54	352.56 - 470.08
Dolj	2	190	547.00	480.76 - 587.60
Galati	1	20	592.94	592.94
Iasi	4	230	594.71	432.69 - 646.36
Mures	3	440	506.45	432.69 - 625.00
Neamt	1	30	534.18	534.18
Olt	1	10	429.48	429.48
Prahova	2	240	585.82	544.87 - 599.35
Tulcea	4	330	636.67	380.34 - 747.86
Vaslui	1	5	480.76	480.76
Vrancea	3	825	448.01	357.9 - 611.11
Total ^a	34	3,905	492	353 - 802

a. Total prices are rounded to the nearest U.S. dollar.

Table 10. Type of Farm Ownership, Quantities Purchased, Mean Price Paid, and Price Range for Poultry Feed Supplement in the Second Auction Series^a

Type of Farm Ownership	Quantity Purchased	Number of Lots Purchased	Mean Price Paid	Price Range
	(mt)	(10 mt)	(US \$/mt)	(US \$/mt)
Commercial societies	2,370	237	482	365 - 623
Agricultural companies	30	3	588	571 - 675
Total	2,400	240	484	365 - 675

a. Prices are rounded to the nearest U.S. dollar.

Table 11. Number of Buyers, Quantities Purchased, Mean Prices, and Price Ranges for Poultry Feed Supplement From the Second Auction Series by District

District	Number of Buyers	Quantity Purchased	Mean Price Paid	Price Range
		(mt)	(US \$/mt)	(US \$/mt)
Alba	3	310	434.50	376.06 - 513.88
Bucharest	1	40	444.44	439.10 - 449.78
Bacau	2	70	566.23	534.18 - 608.97
Braila	2	360	481.04	392.62 - 642.09
Buzau	1	60	478.98	459.40 - 491.45
Calarasi	1	30	605.40	587.6 - 641.02
Constanta	1	80	480.76	448.71 - 512.82
Dambovita	2	350	501.06	443.37 - 588.67
Giurgiu	1	20	641.02	641.02
Iasi	4	490	532.59	438.03 - 600.42
Maramures	1	10	563.03	563.03
Mures	2	25	539.74	401.7 - 574.25
Prahova	1	140	531.13	496.79 - 544.87
Satu Mare	1	5	375.00	375.00
Suceava	1	40	509.08	498.93 - 519.23
Vrancea	1	200	383.54	376.06 - 391.02
Vaslui	2	170	614.31	480.76 - 662.39
Total ^a	27	2,400	484	376 - 662

a. Total prices are rounded to the nearest U.S. dollar.

Table 12. Summary of Prices in the June 1993 Auction by Location, Date, and Time of Bid

Location/Date	Time (a.m.)	Auction Prices (lei/kg) ^a				
		Maximum	Average Award	Market Clearing	Average Bid	Minimum Bid
Giurgiu 18 June	10	211	202	194	183	158
	12	230	218	210	211	197
Bucharest 21 June	10	251	229	213	211	160
	12	280	240	225	232	210
Craiova 23 June	10	235	188	158	178	158
	12	163	160	159	160	158
Iasi 24 June	10	245	231	215	197	160
	12	266	239	225	222	170
Arad 25 June	10	225	209	200	197	175
	12	250	216	200	209	180
Braila 26 June	10	274	253	240	231	160
	12	320	243	185	243	185
Cluj 28 June	10	271	217	200	197	158
	12	231	196	180	194	170
Constanta 29 June	10	301	276	250	225	158
	12	330	276	241	240	160
Total		330	227		210	158

a. 735 lei = US \$1.00.

Table 13. Demand and Supply at the June 1993 Auctions by Location, Date, and Time of Bid

Location/ Date	Time (a.m.)	Quantity (mt)			Demand to Supply Ratio
		Demand	Supply	Diminishing Supply	
Giurgiu 18 June	10	1,210	400	10,220	3.03
	12	850	400	9,820	2.13
	Total	1,340	800		1.68
Bucharest 21 June	10	1,550	550	9,420	2.82
	12	870	550	8,870	1.58
	Total	1,570	1,100		1.43
Craiova 23 June	10	610	400	8,320	1.53
	12	410	400	7,920	1.03
	Total	810	800		1.01
Iasi 24 June	10	3,950	1,200	7,520	3.29
	12	2,130	1,200	6,320	1.78
	Total	3,980	2,400		1.66
Arad 25 June	10	1,040	450	5,120	2.31
	12	750	450	4,670	1.67
	Total	1,220	900		1.36
Braila 26 June	10	2,520	1,000	4,220	2.52
	12	420	420	3,220	1.00
	Total	2,610	1,420		1.84
Cluj 28 June	10	2,010	900	2,800	2.23
	12	1,050	900	1,900	1.17
	Total	2,020	1,800		1.12
Constanta 29 June	10	2,010	500	1,000	4.02
	12	1,410	500	500	2.82
	Total	2,050	1,000		2.05
Total		13,960	10,220		1.37

Table 14. Auction Prices in September-October 1993 by Supplement Type, Location, and Date

Supplement Type and Location	Date	Auction Prices (lei/kg) ^a				
		Maximum Award	Average Award	Market Clearing	Average Bid	Minimum Bid
Swine						
Cluj	September 28	400	363	330	306	215
Bucharest	October 1	480	423	401	384	250
Iasi	October 4	550	512	490	457	260
Braila	October 7	751	596	551	531	300
Poultry						
Cluj	September 28	393	370	351	320	220
Bucharest	October 1	600	440	410	398	250
Iasi	October 4	600	484	460	439	300
Braila	October 7	620	568	537	524	350
Combination						
Cluj	September 28		365		311	
Bucharest	October 1		430		389	
Iasi	October 4		502		450	
Braila	October 7		586		528	
Total			471		403	

a. 963 lei = US \$1.00.

Table 15. Demand and Supply at September-October 1993 Auctions by Supplement Type, Location, and Date

Supplement Type and Location	Date	Quantity (mt)			Demand to Supply Ratio
		Demand	Supply	Diminishing Supply	
Swine					
Cluj	September 28	4,000	1,000	3,905	4.0
Bucharest	October 1	3,520	900	2,905	3.9
Iasi	October 4	2,770	1,000	2,005	2.8
Braila	October 7	1,815	1,005	1,005	1.8
Total		7,110	3,905		1.8
Poultry					
Cluj	September 28	2,100	600	2,400	3.5
Bucharest	October 1	2,005	600	1,800	3.3
Iasi	October 4	1,715	600	1,200	2.9
Braila	October 7	1,600	600	600	2.7
Total		4,685	2,400		1.9
Combination					
Cluj	September 28	6,100	1,600	6,305	3.8
Bucharest	October 1	5,525	1,500	4,705	3.7
Iasi	October 4	4,485	1,600	3,205	2.8
Braila	October 7	3,415	1,605	1,605	2.1
Total		11,495	6,305		1.8

Table 16. Allocation of Feed Supplement at the Second Auction by Location and Date (1993)

Location and Date	Quantity Awarded by Bidder Region (mt)				Quantity Offered
	Cluj	Bucharest	Iasi	Braila	
Cluj (September 28)	260	0	0	1,340	1,600
Bucharest (October 1)	630	360	155	355	1,500
Iasi (October 4)	210	610	420	360	1,600
Braila (October 7)	200	270	490	645	1,605
Total	1,300	1,240	1,065	2,700	6,305

Table 17. Participants, Bidders, Winners, and Quantities Awarded by Type of Farm Ownership

Type of Farm Ownership Structure	Participants	Bidders	Winners	Quantity Received
	(number)			(mt)
Individual	120	10	8	940
Association	22	2	1	35
Commercial Society, Law 31	112	61	49	14,650
Agricultural Company, Law 36	19	4	2	820
Other, No Response	10	2	2	80
Total	283	79	62	16,525
	(%)			
Individual	42	13	13	5.7
Association	8	3	2	0.2
Commercial Society, Law 31	39	76	79	88.6
Agricultural Company, Law 36	7	5	3	5.0
Other, No Response	4	3	3	0.5
Total	100	100	100	100.0

Source: Original IFDC Survey Data collected at the May 1993 seminars with participants defined as the farmers participating in the seminars, bidders are a subset of the participants placing bids at the auctions, and winners are the subset of successful bidders.

Table 18. Distribution of Auction Participants by the Number of Swine Equivalents Owned

Number of Swine Equivalents ^a	Participants	Bidders	Winners
	(%)		
None/No Response	7	1	0
1 to 100	29	4	2
101 to 1,000	23	17	18
1,001 to 2,500	8	11	11
2,501 to 5,000	7	11	11
5,001 to 10,000	8	9	8
10,001 to 20,000	10	25	26
20,001 to 40,000	6	17	18
Over 40,000	2	5	6

a. Swine equivalents based on feed consumption with 1 cow = 9 hogs = 110 chickens (USDA, ERS 1975).

Source: Original IFDC Survey Data.

Table 19. Definition of Variables Used in the Model of Price Discovery

Variable	Definition	Units
AWARDUSD	Weighted average price of winning bids.	U.S. cents/kg
PRIORKNOW	Market clearing price lagged one period with estimated import parity price disclosed in May seminars used for period one.	U.S. cents/kg
PRIORKNOW * OCTOBER	Interaction term between PRIORKNOW and OCTOBER dummy variable	U.S. cents/kg
OCTOBER	Dummy variable for auctions: 1 = October auction 0 = June auction	
DEMAND	Total quantity demanded at an auction	mt
BIDS	Number of qualified bids	bids
BIDDERS	Number of bidders participating	bidders
SUPPLY	Short run supply: quantity of supplement offered	mt
SUPPLYLR	Long run supply: Diminishing total supply for both June and October auctions	mt
SUPPLYLR * OCTOBER	Interaction term between SUPPLYLR and OCTOBER dummy variable.	mt
DISTANCE	Average distance between bidders' farms and port of delivery weighted by quantity bid.	km

Table 20. Summary of Statistics for Variables in the Model of Price Discovery

Variable ^a	Mean	Standard Deviation	Minimum	Maximum
AWARDUSD	37.46	10.39	22.50	61.91
PRIORKNOW	32.58	7.5	22.16	51.31
DEMAND	1763.13	1022.56	410	4,000
BIDS	40.08	23.51	8	85
BIDDERS	15.67	6.65	5	27
SUPPLY	688.54	272.53	400	1,200
SUPPLYLR	4485.83	3245.12	500	10,220
DISTANCE	405.37	151.52	159.8	752.7

a. Refer to Table 19 for definition of variables.

Table 21. Coefficients and Residual Statistics for Variables Used in the Model of Price Discovery

Variable ^a	Coefficients	T-statistic
Dependent:	AWARDUSD	
CONSTANT	19.13913	3.562 ^b
PRIORKNOW	0.54797	3.620 ^b
PRIORKNOW*OCTOBER	0.32433	4.420 ^b
SUPPLYLR	-0.00038859	-2.368 ^c
SUPPLYLR*OCTOBER	-0.002950	-3.883 ^b
DEMAND	0.002342	3.929 ^b
DISTANCE	-0.010785	-3.684 ^b
Adjusted R ²	0.9617	
F statistic	97.26	
Standard Error	2.0327	
Durbin Watson Test	2.3149	

* T-statistic, testing the difference of the coefficient from zero.

- a. Refer to Table 19 for definition of variables.
- b. Significant at the 1% level.
- c. Significant at the 5% level.

Table 22. Summary of Deposits to a Special Account of the Ministry of Agriculture and Food in Banca Agricola^a

Type of Deposit	Amount in Lei
First set of auctions	2,356,991,725
Sales at farmers' fair	21,191,600
Second set of auctions	2,912,433,000
Payment from reserved quantity	39,300,000
Port and office sales	81,116,345
Interest earned, June 1993 through February 1994	874,925,253
Total of deposits and interest (March 11, 1994)	6,285,957,923

a. Account No. 64.26.01.60.

Table 23. Performance Indicators of Swine Feed Supplement^a

	Before Use of Supplement			After Use of Supplement		
	Average	Range	SD ^b	Average	Range	SD ^b
Mean days required to reach 100 kg	285	190-330	45.0	220	168-250	26.0
Mean weight gain per day (kg)	0.39	0.28-0.80	0.27	0.56	0.41-0.85	0.21
Mean feed conversion rate (kg feed/kg weight gain)	9.0	5.0-11.0	2.0	6.0	4.0-8.0	1.1
Mean weight of weaned piglets per sow at 21 days (kg)	32.0	25.0-40.0	10.0	46.0	41.0-52.0	7.0
Mean number of piglets per sow at 21 days	8.0	7.0-10.0	1.7	9.0	8.0-9.0	0.65
Mean piglet weight at 21 days (kg)	4.0	3.0-6.0	0.63	6.0	5.0-6.0	0.58

a. Figures are rounded.

b. SD = Standard deviation.

Table 24. Basic Indicators of the Performance of Protein Supplement for Broilers

	Sample Size	Mean Days to Delivery	Mean Weight Gain Birth-Sale	SD ^a	Mean Feed Conversion Rate ^b	SD ^a	Mortality (%)	SD
Sample 1	10,000	54	1.4	0.14	2.4	0.25	6.0	0.6
Sample 2	10,000	54	1.3	0.31	2.4	0.56	7.0	0.6
Sample 3	10,000	54	1.4	0.25	2.3	0.42	7.0	0.8
Sample 4	10,000	54	1.3	0.13	2.5	0.25	9.0	1.4
Sample 5	10,000	54	1.3	0.46	2.4	0.74	7.0	0.24
Control	10,000	54	1.00	0.50	3.2	0.75	20.0	0.75

a. SD = Standard deviation.

b. kg feed per kg live weight gain.

Table 25. Summary of Animal Waste Management Data Collected From 51 Swine Farms and 17 Poultry Farms

Variable	Yes	No	Unknown	Total
	(%)			
Are waste treatment facilities above the general national standard?	38.0	62.0	-	100
Are storage lagoons used?	26.0	74.0	-	100
Is groundwater around farm used by the public?	30.0	35.0	35.0	100
Do local restrictions apply to the use of animal waste?	29.0	65.0	6.0	100
Is irrigation equipment available?	51.0	28.0	21.0	100
Is equipment for spreading waste solids available?	56.0	25.0	19.0	100
Is information on waste management available?	26.0	59.0	15.0	100

Table 26. Items Given Priority for Purchase by the Directorate of the Geodesy if Vehicle Purchase is Allowed

Description	Quantity Required	Estimated Price	Total Cost
		(lei)	(million lei) ^a
4WD vehicles (Aro)	270	3,500,000	945
Copiers format AO	42	2,500,000	105
Facsimile machines	42	600,000	25.2
Rotring drawing sets	2,000	35,000	70
Rotring ink (11 phial)	500	10,000	5
Rolls Folex plastic sheets	2,000	160,000	320
Printer ribbons	500	5,000	2.5
Copier toner cartridges	100	80,000	8
3.5-inch diskette boxes	2,000	16,000	32
Fax paper rolls	4,000	5,000	20
A3 printer paper packs	4,200	10,000	42
AO paper packets	2,000	18,000	36
Electronic Planimeters	170	250,000	42.5
A3 (2 color) printers	42	400,000	16.8
Optical disc system	42	3,000,000	126
Total			1,796

a. 615 lei = US \$1.00 on May 15, 1993.

Source: Ministry of Agriculture and Food, Director of Geodesy, for quantities of each item. Prices have been updated to agree with those used in Tables 27 and 28. Total estimated cost on May 17, 1993, was US \$1,736,200,000.

Table 27. Items Given Priority for Purchase if Vehicle Purchase is Not Allowed

Description	Quantity Required	Estimated Price	Total Cost ^a
		(lei)	(million lei)
386 portable computers	170	1,300,000	221
Copiers format AO	42	2,500,000	105
Facsimile machines	42	600,000	25.2
Scientific calculators	400	20,000	8
Programmable calculators	500	80,000	40
Electronic Planimeters	420	250,000	105
A3 (2 color) printers	42	400,000	16.8
486 portable computers	84	2,000,000	168
A3 plotters	84	1,600,000	134.4
Printer ribbons	1,000	5,000	5
Copier toner cartridges	200	80,000	16
3.5-inch diskette boxes	1,000	16,000	16
Fax paper rolls	8,000	5,000	40
A3 printer paper packs	5,000	10,000	50
AO paper packets	5,000	18,000	90
A4 paper packets	5,000	5,000	25
Rotring drawing sets	1,000	35,000	35
Rotring ink (11 phial)	3,000	10,000	30
Rolls Folex plastic sheets	2,000	160,000	320
Rolls Scotch paper	10,000	800	8
Radiotelephones	600	250,000	150
Radiotelephones battery chargers	600	40,000	24
Computer desks	100	100,000	10
Desks for employees	1,200	35,000	42
Chairs for employees	1,200	10,000	12
Total			1,696.4

a. As of May 15, 1993, the official exchange rate of the lei is 615 lei/US \$1.00.

Source: Ministry of Agriculture and Food, Director of Geodesy.

Table 28. Additional Items Given Priority for Purchase by the Directorate of the Geodesy if Vehicle Purchase is Not Allowed

Description	Quantity Required	Estimated Price	Total Cost ^a
		(lei)	(million lei)
386 portable computers	100	1,300,000	130
Scientific calculators	400	20,000	8
Programmable calculators	500	80,000	40
Printer ribbons	1,500	5,000	7.5
Copier toner cartridges	800	80,000	64
3.5-inch diskette boxes	2,000	16,000	32
Rotring drawing sets	1,000	35,000	35
Rotring ink (11 phial)	3,000	10,000	30
Rolls Folex plastic sheets	3,000	160,000	480
Optical disk systems	42	3,000,000	126
Bookcases for plans and maps	420	200,000	84
Cases for computer disks	200	250,000	50
Salaries for experts			213.5
Total			1,300

a. 615 lei = US \$1.00 on May 15, 1993.

Source: Ministry of Agriculture and Food, Director of Geodesy.

Table 29. Recommended Monthly Report by the Ministry of Agriculture and Food to USAID and IFDC

Month: _____ 1993

Item	Number Received This Month	Number Received to Date	Total Number Ordered	Unit Price	Calculated Expenditures This Month ^a	Calculated Expenditures to Date ^a	Total Projected Cost
				(lei)			(million lei)
386 portable computers			170	1,300,000			221
Copiers format AO			42	2,500,000			105
Facsimile machines			42	600,000			25.2
Scientific calculators			400	20,000			8
Programmable calculators			500	80,000			40
Electronic Planimeters			420	250,000			105
A3 (2 color) printers			42	400,000			16.8
486 portable computers			84	2,000,000			168
A3 plotters			84	1,600,000			134.4
Printer ribbons			1,000	5,000			5
Copier toner cartridges			200	80,000			16
3.5" diskette boxes			1,000	16,000			16
Fax paper rolls			8,000	5,000			40
A3 printer paper packs			5,000	10,000			50
AO paper packets			5,000	18,000			90
A4 paper packets			5,000	5,000			25
Rotring drawing sets			1,000	35,000			35
Rotring ink (11 phial)			3,000	10,000			30
Rolls Folex plastic sheets			2,000	160,000			320
Rolls Scotch paper			10,000	800			8
Radiotelephones			600	250,000			150
Radiotelephones battery chargers			600	40,000			24
Computer desks			100	100,000			10
Desks for employees			1,200	35,000			42
Chairs for employees			1,200	10,000			12
							1,696.4

a. Prices are calculated by multiplying number received by contract price for current month and to date and are not related to actual invoices and payments.

- A. For all items for which total delivered to date is less than number tendered, a short explanation will be given explaining when delivery is expected and whether this represents the terms of the tender or a problem. If it is a problem, please explain what is being done to correct the problem.
- B. How much has been actually paid from the account this month, total paid to date, and what is the balance in the account at the end of the month?
- C. Individual parcels surveyed to date: _____.
- D. Individual land titles issued to date: _____.



Figure 1. A National Map of Romania by District.

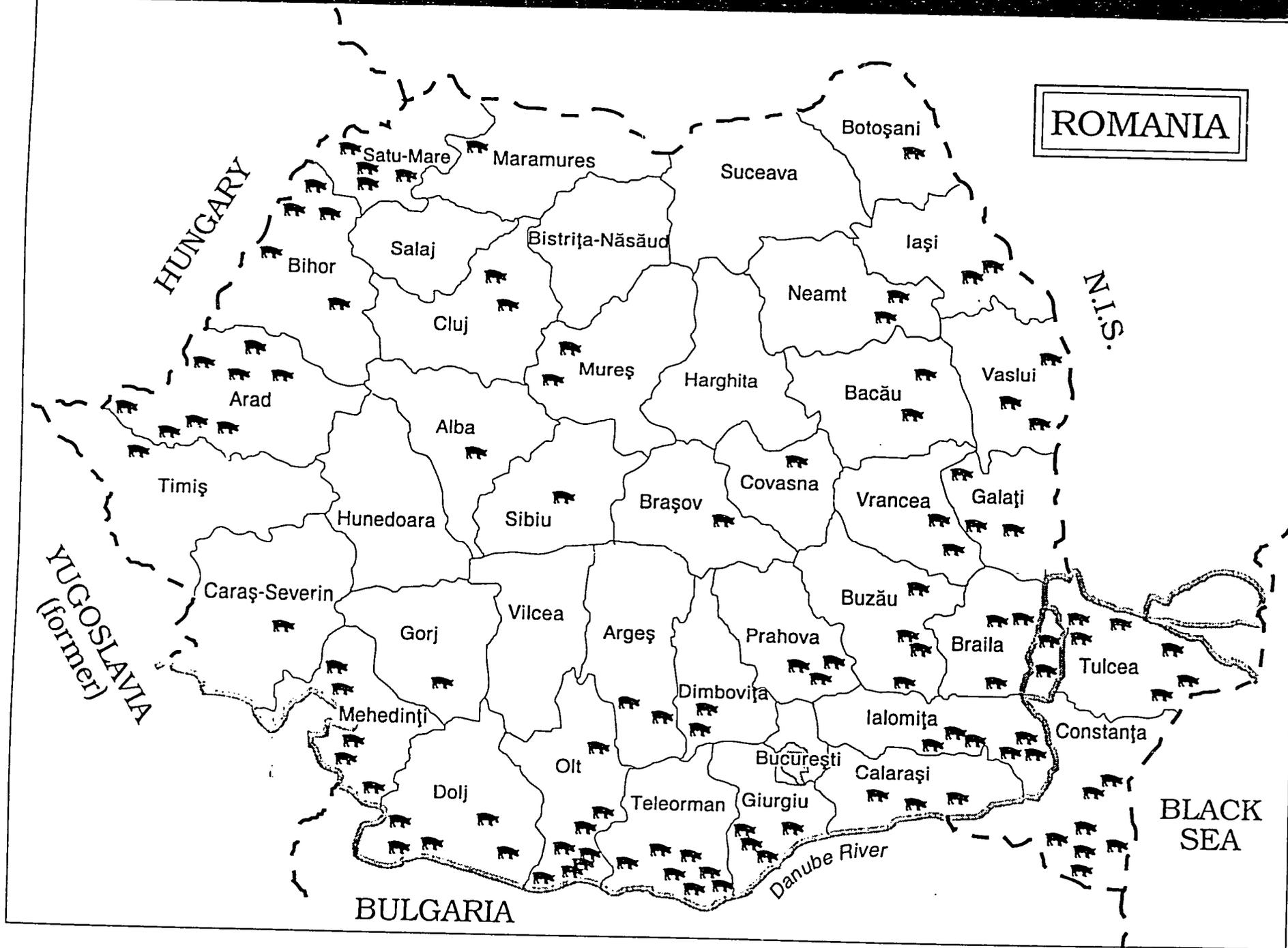
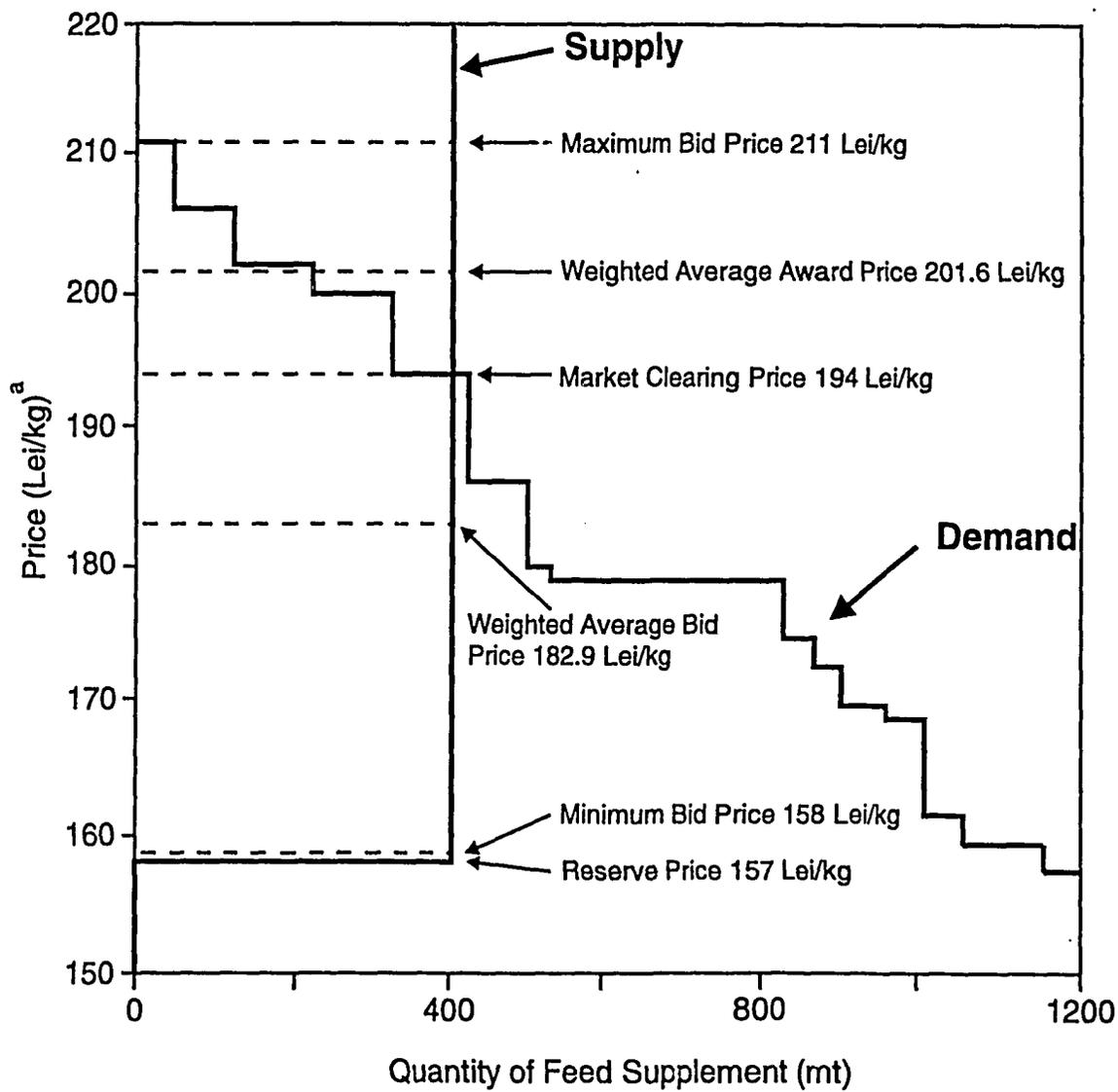


Figure 2. Private Swine Farms in Romania by District.



a. 615 Lei = 1.00 U.S.

Figure 3. Supply, Demand, and Price Indicators of Supplement Awarded, June 1993.

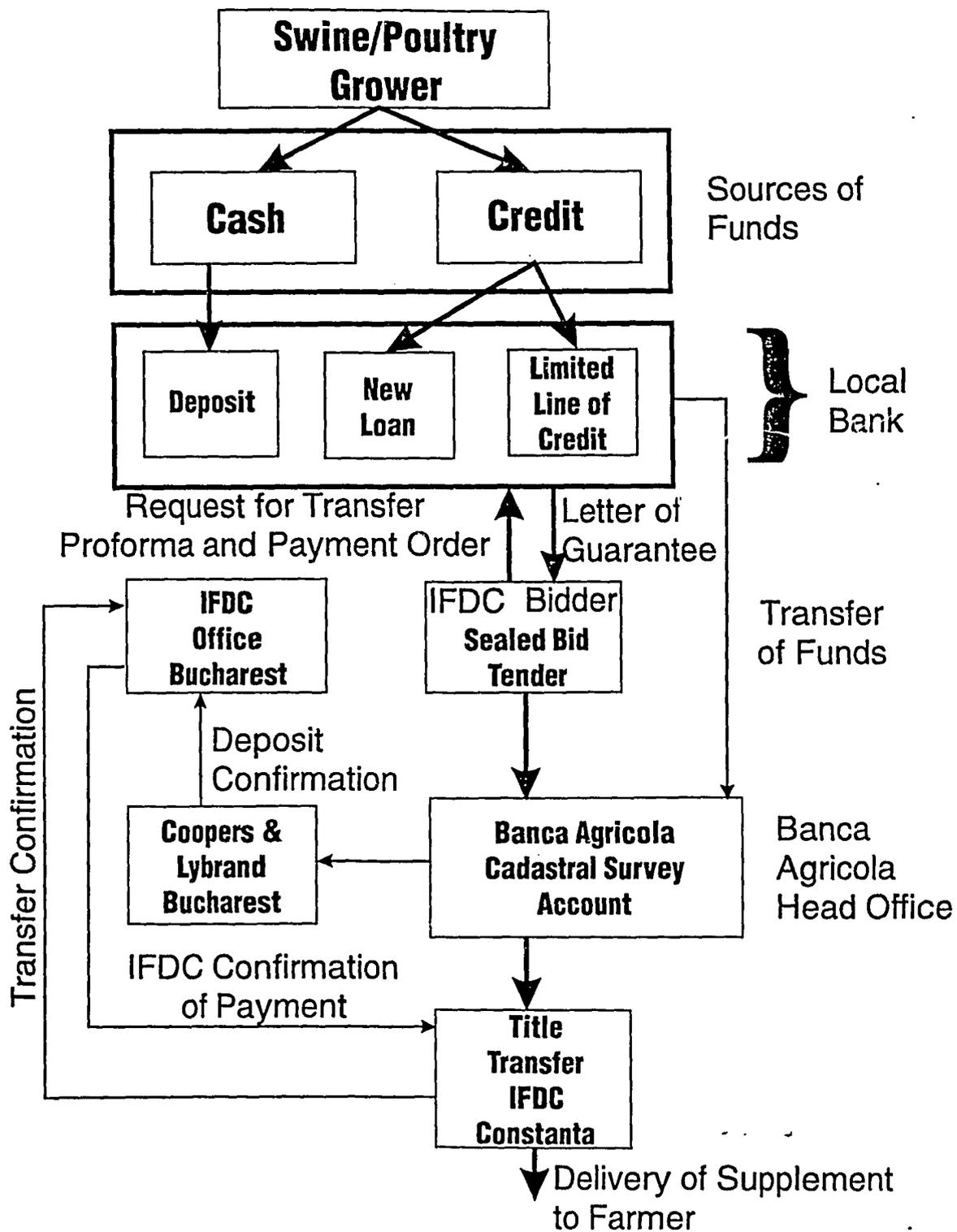


Figure 4. Flowchart of Financial Transaction.

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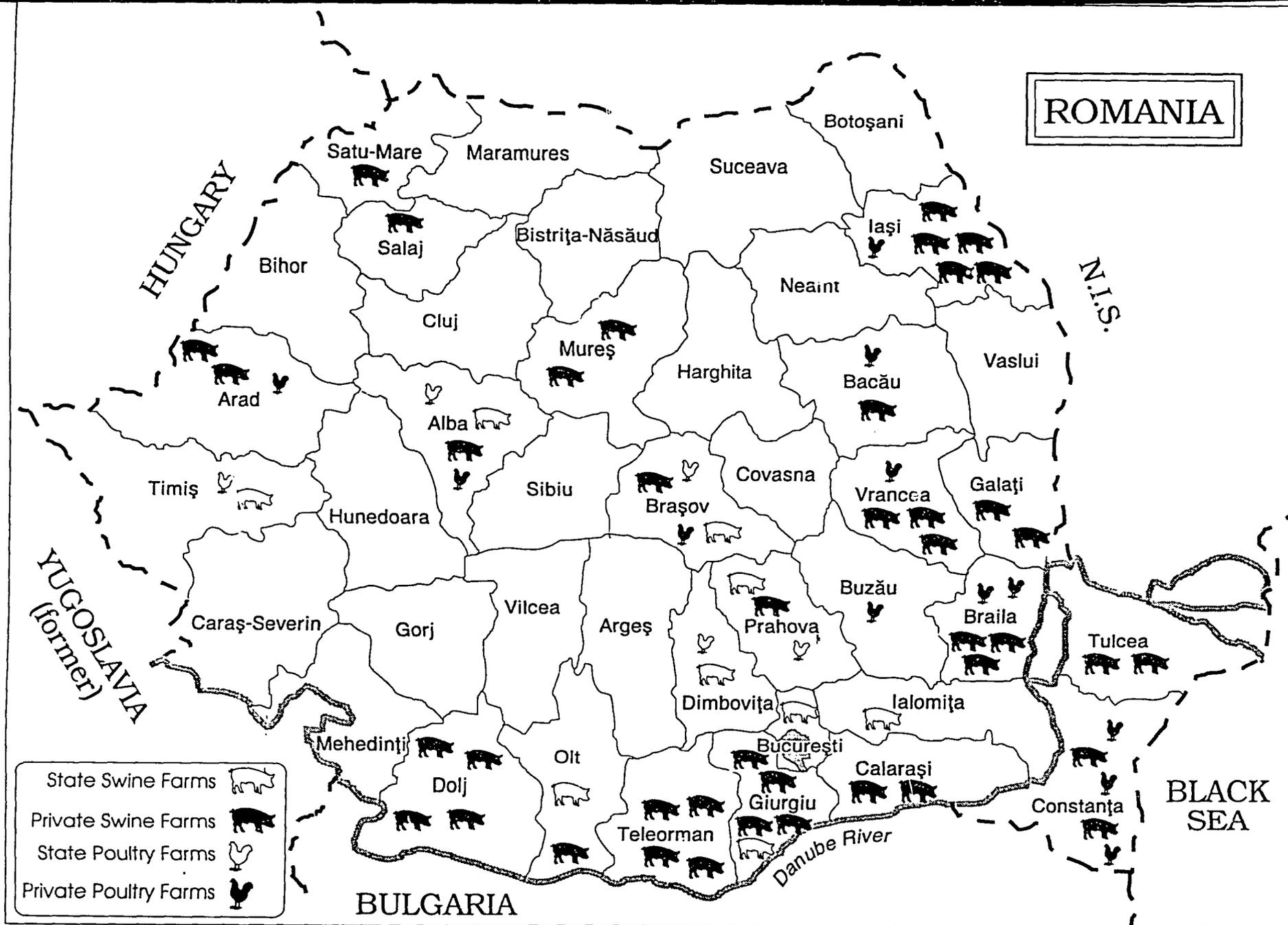


Figure 5. Swine and Poultry Farms Surveyed to Assess Animal Waste Management in Romania.



Figure 7. Poultry Farms Surveyed by District and Number of Birds.

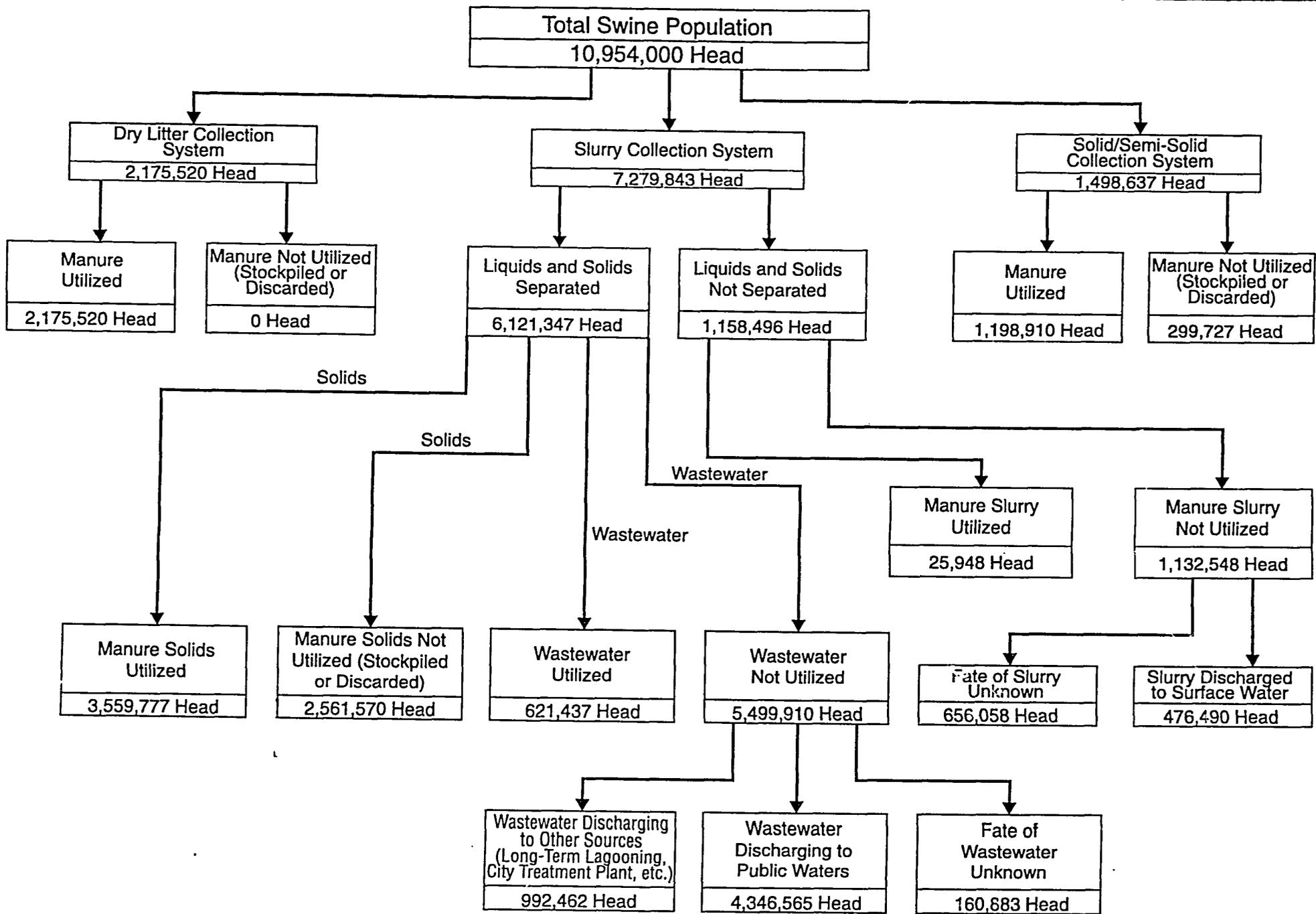


Figure 8. Use and/or Discharge of Swine Manure - Extrapolated From Sample Farms Based on the 1992 Swine Population.

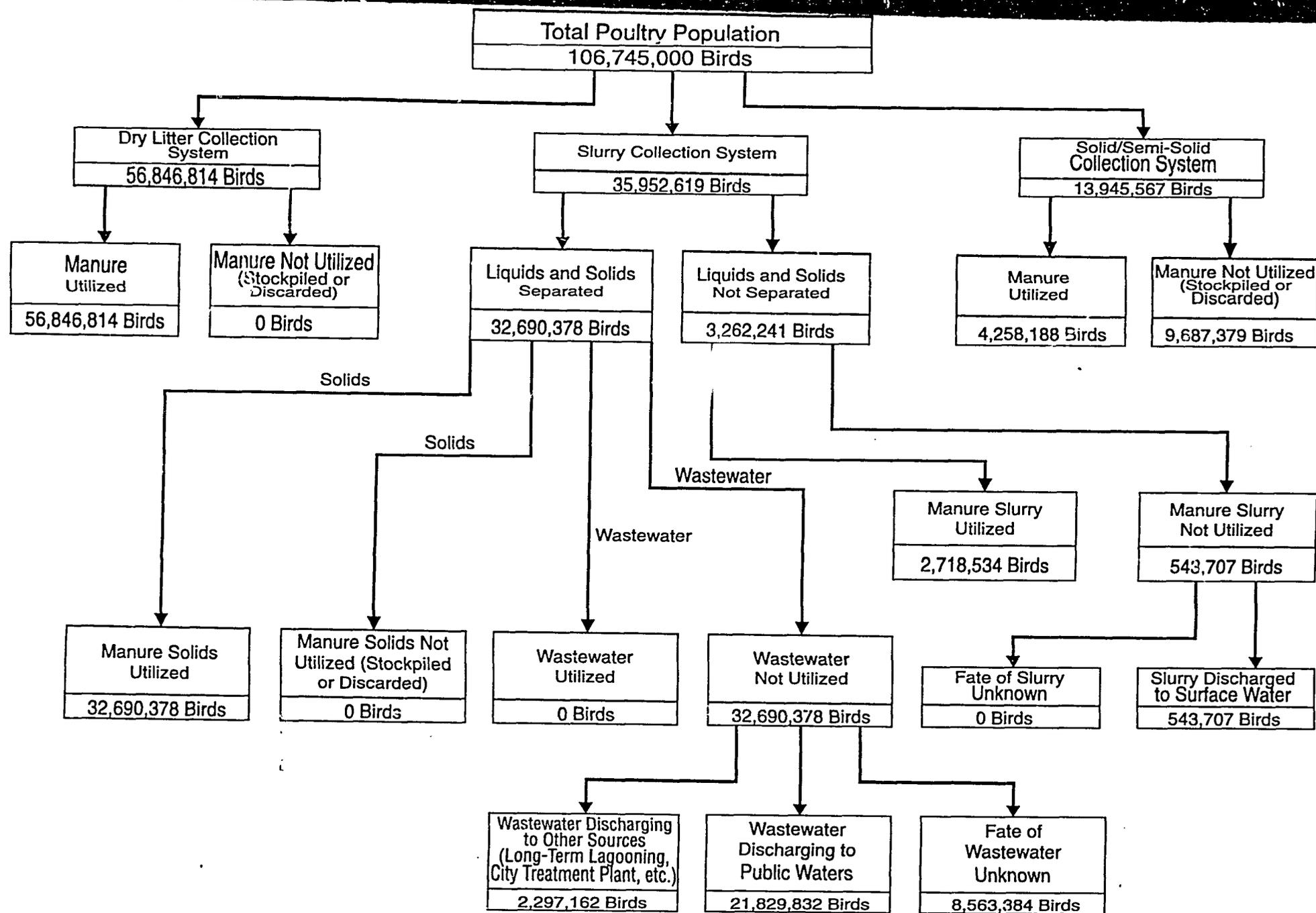


Figure 9. Use and/or Discharge of Poultry Manure - Extrapolated From Sample Farms Visited Based on the 1992 Poultry Population.

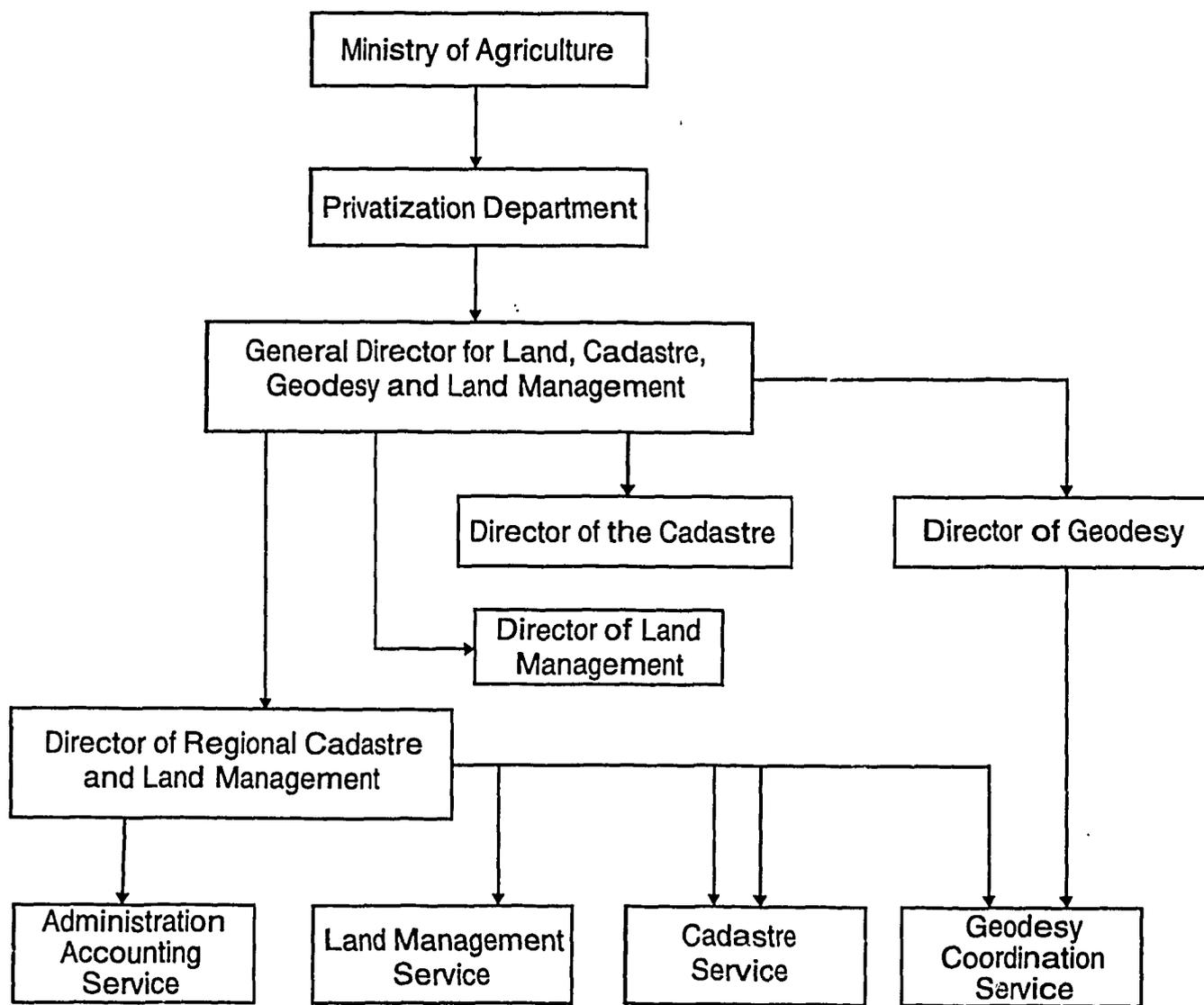


Figure 10. Ministry of Agriculture and Food, Cadastral Survey Organizational Chart.

Appendix

Appendix

Papers and Reports Submitted by the IFDC on the Support to Romania Agricultural Sector Grant Program

1. "Romania Commodities Import Program, Report No. 1" (October 1992).
2. "Romania Commodities Importation Program, Final Revision" (February 1993).
3. "Request for Grant – Assistance to the Government of Romania for Importation of Protein-Based Animal Feed Supplement" (January 1993).
4. "IFDC Romania Commodity Importation Program: Seminar and Auction Report No. 1" (September 1993).
5. "Romania, World Bank Mission for Development of a Strategy for the Transition in Agriculture" (May 1993).
6. "Romania, A Strategy for the Transition in Agriculture" (November 1993).
7. "Private Farmer Price Discovery in a Transition Economy: Sealed Bid Auctions in Romania" (December 1993).
8. "IFDC-Romania Commodity Importation Program: Assessment of Manure Management and Environmental Issues of the Seine and Poultry Production Sector in Romania" (April 1994).
9. "Quarterly Reports."
 - A. January-March 1993.
 - B. April-June 1993.
 - C. July-September 1993.
 - D. October-December 1993.
 - E. January-March 1994.
 - F. April-June 1994.
 - G. July-September 1994.
 - H. October-December 1994.
10. "Logistics Associated With the Second Shipment of High-Protein Animal Feed Supplement to Romania."
11. "Programming Romanian Cadastre Funds From the Commodity Import Grant Agreement (CIGA) (January 1993).

12. "The Introduction of the Free Market to Romanian Agriculture." (M. O. Klein, May 1994).
13. "IFDC Romania Commodity Importation Program: Seminar and Auction Report No. 2 (June 1994).
14. "Executive Summary – A Plan for Privatizing Agri-Input Marketing in Romania" (June 1994) (L. B. Williams).
15. "A Plan for Privatizing Agri-Input Marketing in Romania" (July 1994) (L. B. Williams).
16. "Logistical Considerations With Respect to the Second Shipment and Distribution of Feed Supplement Consisting of Both Swine and Poultry Products to Romania," November 1993 (J. M. Kelly)
17. "Assessment of Manure Management and Environmental Issues of the Swine and Poultry Production Sector in Romania – A Discussion Paper," July 1994 (D. W. Rutland)
18. "Private Farmer Price Discovery at Sealed Bid Auctions in Romania," September 1994 (N. Rask/G. Hellwarth)
19. "Private Farmer Price Discovery at Sealed Bid Auctions in Romania," Norman Rash and Galen Hellwarth, Ohio State University.
20. "Furthering the Reform Process for Agri-Inputs Markets in Romania," (D. Waggoner, I. Gregory, S. Sidhu, R. Diamond), January 1995
21. "Consensus Paper for Modifications and Approval at the Workshop on Animal Manure Management in Romania Workshop," draft for delegates' review (October 1994).

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