REPRESENTATIVE FARMS ECONOMIC OUTLOOK FOR THE JANUARY 1999 FAPRI/AFPC BASELINE

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Executive Summary

The farm level economic impacts of the Federal Agriculture Improvement and Reform Act of 1996 (FAIR) on representative crop and livestock operations are projected in this report. The primary objective of the analysis is to determine the representative farms' economic viability by region and commodity throughout the life of the 1996 Farm Bill. The representative farm economic data is developed in cooperation with a panel of producers to describe and simulate representative crop, livestock, and dairy farms. Projected prices, policy variables, and input inflation rates from the Food and Agricultural Policy Research Institute (FAPRI) January 1999 Baseline.

- All of the crop farm sectors show substantial cash flow pressure. The pressure stems from 2 major areas: low prices and adverse weather in 1996 and 1998. The crop farms are able to maintain firm wealth on average.

- Six of the 13 feed grain farms have a 25 percent chance of a negative net cash farm income in any one year. Ten of the feed grain farms had a greater than 60 percent probability of a cash flow deficit in 1998. All of the moderate size feed grain farms, except the Central Missouri farm, experience a cash flow deficit after 1998 of greater than 40 percent.

- Seven of the 10 representative wheat farms have a 40 percent probability of experiencing annual cash flow deficits. One-half of the wheat farms exhibit cautionary signs related to their economic health over the baseline period.

- All of the cotton farms are projected to have serious cash flow problems over the 1996-2002 study period.

- Two-thirds of the 9 rice farms experience cautionary levels of cash flow deficits over the study period. The three farms in Missouri and Louisiana exhibit a high probability of losing real net worth by 2002.

- The dairy sector appears strong but prices are highly volatile. Nine of the 26 dairy farms experience increasing cash flow pressure over the period. Low baseline feed prices and a high 1998 milk price present a favorable baseline for the dairy farms.

- Rising cattle prices over the baseline period present a positive outlook for the beef cattle ranches. The Wyoming and Missouri ranches reduce the odds of cash flow deficits and the Colorado and Montana ranches are able to build some cash reserves.

- Cash flow problems on all of the hog farms in 1998 are overcome by 2002 for 6 of the 8 farms. The hog price debacle of 1998 is extremely difficult for the moderate size Missouri and Indiana farms to overcome. The larger farms are better able to survive over the long haul.

REPRESENTATIVE FARMS ECONOMIC OUTLOOK FOR THE JANUARY 1999 FAPRI/AFPC BASELINE

The farm level economic impacts of the Federal Agriculture Improvement and Reform Act of 1996 (FAIR) on representative crop and livestock operations are projected in this report. For this report the FAIR Act will be referred to as the 1996 Farm Bill. The analysis was conducted over the 1996-2002 planning horizon using AFPC's whole farm simulation model. Data to simulate farming operations in the nation's major production regions came from two sources:

- Producer panel cooperation to develop economic information to describe and simulate representative crop, livestock, and dairy farms.

- Projected prices, policy variables, and input inflation rates from the Food and Agricultural Policy Research Institute (FAPRI) January 1999 Baseline.

The primary objective of the analysis is to determine the farms' economic viability by region and commodity throughout the life of the 1996 Farm Bill.

The AFPC farm level policy simulation model incorporates the historical risk faced by farmers for prices and production. Averages for the simulated values of key output variables are normally presented in AFPC policy analysis reports. This report breaks from that tradition by presenting the results of the January 1999 Baseline in a risk context using selected probabilities and simulated ranges for annual net cash farm income values. The probability of a farm experiencing annual cash flow deficits and the probability of having to refinance cash flow deficits are provided to show the financial risk faced by the representative farms. The probability of a farm losing real net worth is included as an indicator of the equity risk facing farms over the life of the 1996 Farm Bill.

This report is organized into ten sections. The first section summarizes the process used to develop the representative farms and the key assumptions for the farm level analysis. The second section summarizes the FAPRI January 1999 Baseline and the policy and price assumptions used for the representative farm analyses. The third through sixth sections present the results of the simulation analyses for feed grain, wheat, cotton, and rice farms. The seventh through ninth sections summarize simulation results for dairy, cattle and hog farms. Two appendices constitute the final section of the report. Appendix A provides tables to summarize the physical and financial characteristics for each of the representative farms. Appendix B provides the names of producers, land grant faculty, and industry leaders who cooperated in the panel interview process.

Panel Process

AFPC has developed and maintains data to simulate more than 80 representative crop and livestock farms chosen from major production areas across the United States (Figure 1). Characteristics for each of the farms in terms of location, size, crop mix, assets, and average receipts are summarized in Appendix A. The location of these farms is primarily the result of discussions with

staffers for the House and Senate Agriculture Committees. Information necessary to simulate the economic activity on these representative farms is developed from panels of producers using a consensus building interview process. Normally two farms are developed in each region using separate panels of producers: one is representative of moderate size full-time farm operations, and the second panel usually represents farms two to three times larger.

The data collected from the panel farms are analyzed in a whole farm simulation model (FLIPSIM) developed by AFPC. The producer panels are provided pro-forma financial statements for their representative farm and are asked to verify the accuracy of simulated results for the past year and the reasonableness of a four to five year projection. Each panel must approve of the model's ability to reasonably reflect the economic activity on their representative farm prior to using the farm for policy analyses.

The farms used in the analysis have all been updated with the panels through 1996 and many have been updated in the first quarter of 1999. Representative farms in the whole farm data base that have not been updated in 1996 are not reported in this Working Paper. All of the crop farms are assumed to begin 1996 with 20 percent intermediate- and long-term debt, based on information provided by ERS-USDA and the panel members. Initial debt levels for dairy farms were set at 30 percent; initial debt levels for beef cattle ranches were 1 percent for land and 5 percent for cattle and machinery; and initial debt levels for hog farms were 45 percent.

Key Assumptions

- All farms classified as moderate scale are the size (acres or number of livestock) considered to be representative of a majority of full-time commercial farming operations in the study area. In many regions, a second farm, two to three times larger than the moderate scale farm is developed as an indicator of size economies.

- Dairy, hog, and cattle herd sizes are held constant for all farms over the 1996-2002 planning horizon.

- The farm was structured so government payment limits were not effective at reducing contract payments and loan deficiency payments.

- Minimum family living withdrawals were assumed at a base rate of 10 percent of gross receipts or $25,000 annually, whichever is lower. Actual family living withdrawals are determined by historical consumption patterns. Therefore, as the farm's profitability increases so does the level of family living withdrawals.

- The farm is subject to owner/operator federal (income and self-employment) and state income taxes as a sole proprietor, based on the current tax provisions.

- No off-farm-related income including family employment was included in the analyses.

- Farm program parameters, average annual prices, crop and livestock yield trends, interest rates, and input cost inflation (deflation) are based on the January 1999 FAPRI Baseline which assumes implementation of the 1996 Farm Bill.

- Contract payments for participating cotton, wheat, feed grain, and rice producers are made based on 85 percent of their historical base acreage times farm program yield times a contract payment rate. The contract payment rate is included in the January 1999 FAPRI Baseline.

- The farms are assumed to be enrolled in the 7 year production flexibility program and take full advantage of the flexibility provisions in the 1996 Farm Bill (within the current crop mix). Crop mix changes after 1996 (1998 if updated) were estimated based on projected net returns for each of the enterprises currently produced on the farms. During the update process most of the crop farm panels indicated that they would flex out of their current crop mix, but only if expected net returns per acre from the change exceeded $40, due to rotation and/or other cultural concerns.

- Marketing loan provisions for cotton, rice, wheat, feed grains, and soybeans were authorized in the 1996 Farm Bill and are assumed to be in place for the farm level analysis.

- The farm level simulation model incorporates price and yield risk faced by farmers. Historical yield variability for crops and production for livestock (sale weights and milk/cow) over the past ten years are assumed to prevail for the planning horizon. Market prices for crops and feedstuffs are assumed to be more variable than over the past ten years due to the 1996 Farm Bill provisions, based on recent research. The assumed increase in relative price variability is: 82 percent for feed grains, 40 percent for wheat, 26 percent for soybeans, 1 percent for cotton and rice, and 10 percent for livestock. Random prices are appropriately correlated based on historical correlations, among crop and livestock prices, both within year and across years.

- To simulate the historical portion of the planning horizon crop yields were held constant, based on county averages obtained from USDA/NASS for 1996 and 1997. Average yields for 1998 were simulated based on the USDA/NASS state averages or on average yields provided by facilitators. Prices were held constant at USDA/NASS state values for 1996 and 1997. The 1998 prices were stochastic to simulate the effect that the 1998 crops have not been all marketed.

- The 1996 Farm Bill eliminated the dairy assessments after 1996 and provides for a reduction in the milk support price starting in 1997. Each year the dairy support price falls 15 cents per hundred weight until the support price reaches $9.90 per hundred weight in 1999, after which it is eliminated.

- Market loss assistance payments and disaster provisions passed in late 1998 have been incorporated.

- All farms are assumed to carry MPCI at the 50/100 level.

FAPRI January 1999 Baseline

Projected crop prices for FAPRI's January 1999 Baseline are summarized in Table 1. Projected corn prices decline from the high of $2.71/bu. in 1996 to a low of $2.00/bu. in 1999 then increase until they reach $2.17/bu. in 2002. Wheat prices are projected to decline to $2.66/bu. by 1998 and then increase through 2002 when wheat prices are projected at $3.34/bu. Cotton prices will likely decline until 2000 reaching a low of $0.5309/lb. and then increase slightly to $0.5796/lb. in 2002. Rice prices are projected to decline from the $9.96/cwt. level realized in 1996 to $8.61/cwt. by 1999 and remain below $8.90/cwt. throughout the remainder of the study period.

Assumed loan rates and projected annual contract (AMTA) payment rates, net of 1995 deficiency repayments in 1996 and 1997, are also summarized in Table 1. The farms growing contract commodities were assumed to have accepted the 1995 advance deficiency payments and had the repayments offset against 1996 contract payments for wheat, barley, oats, and upland cotton and the 1997 contract payments for corn and soybeans. The assumed contract or AMTA payment rates for 1998 reflect the increase for the 1998 market loss assistance payments authorized in 1998.

Projected livestock prices for FAPRI's January 1999 Baseline are summarized in Table 2. Beef cattle prices are projected to increase throughout most of the planning horizon after the drought induced decline in 1998. Actual feeder cattle prices were reported at $61.31 and $81.34/cwt. for 1996 and 1997, and then projected to decline to $77.70/cwt. in 1998. Following this one year adjustment prices are projected to increase gradually to $91.98/cwt. in 2002. Hog prices decline after 1996 reaching a low of $31.74/cwt. in 1998 and then recovering to $43.44/cwt. in 2002. Annual milk prices for the 12 states, where representative dairy farms are located, are summarized in Table 2. U.S. milk prices increased dramatically in 1998 to $15.39/cwt. but are projected to decrease to the $13.00 to $13.20/cwt. range for the 2000 through 2002 period.

Projected annual rates of change for variable cash expenses are presented in Table 3. The rate of change in input prices and interest rates come from FAPRI's January 1999 Baseline which relies on WEFA's macroeconomic projections. Annual interest rates paid for long- and intermediate-term loans and earned for savings are also summarized in Table 3. Assumed annual rates of change in land values over the 1997-2002 period are provided by the FAPRI Baseline (Table 3).

Definitions of Variables in the Summary Tables

**Annual Change in Real Net Worth, 1996-2002 --** annualized percentage change in the operator's net worth from January 1, 1996 through December 31, 2002, after adjusting for inflation. This value reflects the real annualized increase or decrease in net worth or equity for the farm over the planning horizon including changes in real estate values.

**Net Income Adjustment (NIA), 1996-2002 --** NIA is the annual increase or decrease in net cash farm income necessary to cause the change in real net worth, including land inflation, to equal zero over the planning horizon. If the change in net worth is negative, the NIA is the annual increase in net income necessary to prevent a loss in total real net worth. NIAs are expressed both as total dollars per year and as a percent of average annual cash receipts.

- **Cost to Receipts Ratio, 1996-2002** -- average ratio of total cash expenses to total receipts (from all sources). Cash expenses include interest costs, fixed cash costs, and variable costs but exclude principal payments, depreciation, income taxes, and family living expenses. Total receipts include crop and livestock receipts plus government payments and insurance indemnities.

- **Government Payments/Receipts, 1996-2002 –** sum of all farm program payments (AMTA and marketing loan deficiency payments) divided by total receipts received from the market plus contract payments, marketing loans, crop insurance indemnities, and other farm related income.

- **Total Cash Receipts** -- sum of cash receipts from all sources, including market sales, AMTA (or contract) payments, CCC loans, marketing loan deficiency payments, crop insurance indemnities, and other farm related income. The values in the tables are the average total receipts for each year in the planning horizon.

- **Net Cash Farm Income** -- equals total cash receipts minus all cash expenses. Net cash farm income is used to pay family living expenses, principal payments, income taxes, self employment taxes, and machinery replacement costs. The values in the tables are the averages for each year in the planning horizon.

- **Probability of a Cash Flow Deficit** -- is the number of times out of 100 that the farm's annual net cash farm income does not exceed cash requirements for family living, principal payments, taxes (income and self-employment), and actual machinery replacement expenses (not depreciation). This probability is reported for each year of the planning horizon to indicate whether the cash flow risk for a farm increases or decreases over the planning horizon.

- **Ending Cash Reserves** -- equals total cash on hand at the end of the year. Ending cash equals beginning cash reserves plus net cash farm income and interest earned on cash reserves less principal payments, federal taxes (income and self employment), state income taxes, family living withdrawals, and actual machinery replacement costs (not depreciation).

- **Probability of Refinancing Deficits** -- is the number of times out of 100 that cash flow deficits are greater than available cash reserves. This probability is reported for each year of the planning horizon to indicate whether the financial risk for a farm increases or decreases over the planning horizon.

- **Nominal Net Worth** -- equity at the end of each year equals total assets including land minus total debt from all sources. Net worth is not adjusted for inflation and averages are reported for each year in the planning horizon.

- **Probability of Losing Real Net Worth** -- is the number of times out of 100 that real net worth is less than the initial net worth for the farm. The probability is reported for each year of the planning horizon to indicate whether the equity risk is increasing or decreasing from year to year.

Feed Grain Farm Impacts

Eleven of the thirteen feed grain farms are projected to increase real net worth over the 1996-2002 study period. Annual average changes in net worth, after adjusting for inflation, range from -2 percent on the Nebraska farm (NEG800) to more than 7 percent for the large Texas Northern High Plains operation (Figure 3). Six of the thirteen feed grain farms had projected annualized increases in real net worth of more than four percent.

In all regions where AFPC monitors both a moderate and large scale operation, the larger operations are more financially sound than their moderate scale counterparts (Tables 4-5 and Figures 3-7).

While only the moderate Nebraska and Tennessee farms appear to be struggling based on their ability to maintain net worth over the study period, there are some warning flags from an operational perspective for at least six other farms.

- Six of the thirteen feed grain farms have approximately a 1 in 4 chance that net cash farm incomes will be at or below zero for any individual year during the study period (Figures 4-7).

- Ten of the feed grain farms had greater than a 60 percent probability of a cash flow deficit in 1998. Low prices for crops and livestock, and low yields in Texas and the Southeast, were responsible for the low farm incomes which caused cash flow deficits for many farmers.

- The probability that the farm will annually experience a cash flow deficit after 1998 is greater than 40 percent for the moderate Iowa, both Nebraska, the Northern Missouri, the moderate Texas Northern Plains, both Tennessee, and the moderate South Carolina operations (Figures 4-7).

- These annual cash flow deficits will have to be covered either through refinancing operating debt or drawing down cash surpluses. Eight of the feed grain farms appear capable of offsetting annual declines in cash flow from cash reserves. Both Nebraska farms, the moderate Tennessee farm, the moderate South Carolina farm, and the Northern Missouri farm, however, will likely have to depend on debt refinancing if they are to maintain operations. The probability of refinancing ranges from 95-99 percent for the moderate Nebraska, 49-79 percent for the large Nebraska farm, 29-41 percent for the moderate South Carolina farm, 88-93 percent for the Northern Missouri, and 69-79 percent for the moderate Tennessee. On all five farms the average cash expense to receipts ratio exceeded 85 percent. Past experience suggests that expense to receipt ratios exceeding 85 percent will likely lead to operational cash flow problems for most crop dependent farms.

Wheat Farm Impacts

All ten wheat farms experience annual growth in real net worth over the 1996-2002 study period

(Figure 9). The annual growth in real net worth ranges from 1.7 percent for the Northwest Kansas farm to over 7 percent for the moderate Colorado farm.

While the wheat farms appear sound based on their ability to maintain real net worth, there are warning signs from an operational perspective.

- Six of the ten farms, both Washington, both North Dakota, and both Northwest Kansas farms have a greater than 5 percent chance of experiencing negative net cash farm incomes in any individual year for most of the study period (Figures 10-12).

- Seven of the farms, WAW1500, WAW4250, NDW1760, NDW4850, KSSW1385, KSNW2325, and KSNW4300, have greater than a 40 percent probability of experiencing an annual cash flow deficit in any individual year (Table 6 and Figures 10-12).

- Only two of these eight farms, however, will likely have to seek outside sources to refinance cash flow deficits. The moderate Washington farm is projected to seek outside refinancing up to 36 percent of the time by 2002. It is also troubling that this percentage is steadily increasing over the period. The moderate Northwest Kansas (KSNW2325) farm will likely need to refinance its operating loan 45 percent of the time by 2002 (Figures 10-12).

In three of the five wheat regions, the larger scale operation appears to be in better financial shape than their moderate scale counterparts (Table 6 and Figure 9). This is not the case, however, in Eastern Colorado and North Dakota where the moderate scale operations have a slight financial advantage, due in part to lower labor costs.

Cotton Farm Impacts

Seven of the nine cotton farms experience positive annual increases in real net worth over the 1996-2002 study period ranging from 1 to 8 percent. The Texas Rolling Plains and Coastal Bend farms lose equity annually.

All nine farms are projected to have serious cash flow problems over the 1996 to 2002 period (Table 7 and Figures 15-17).

Four of the cotton farms (TXRP2500, TXCB1700, TNC1675, TNC3800) have a greater than 25 percent chance of a negative net cash farm income in any individual year from 1998 to 2002.

The cash flow problems projected for six of the nine cotton farms will likely lead to an increase in the need for refinancing. The moderate Texas Southern Plains, Rolling Plains, Coastal Bend, and both Tennessee farms will likely have considerable problems getting refinanced through the period.

- The probability of refinancing cash flow deficits is 99 percent in the drought year (1998) for the TXSP1682 farm and improves to 42 percent by 2002. The probability of the TXRP2500, TXCB1700, TNC1675, and TNC3800 farms refinancing cash flow deficits increases over the planning horizon, indicating that these farms will have to restructure to handle the risk conditions facing cotton farmers (Figures 15-17).

- The probability of refinancing cash flow deficits improves from 57 percent in 1998 to 3 percent in 2002 for the large cotton farm in the Texas Southern High Plains (TXSP3697). The probability of refinancing deficits declines from 53 in 1998 to 24 percent in 2002 for the Texas Blacklands farm (TXBL1400).

- The California cotton farms are better able to handle the increased risk associated with cotton due to their lower cost to receipts ratios and diversification in other crops. These farms are projected to have very small probabilities of refinancing cash flow deficits, even though their probabilities of cash flow deficits increase over the period to around 50 percent by 2002.

Rice Farm Impacts

With production flexibility payments and rice prices that are projected to stay in the $8.60 to $9.00/cwt range, all but one of the nine representative rice farms experience annual growth in real net worth, ranging from 0.7 - 8 percent over the study period (Figure 19). Only the moderate Missouri (MOR1900) operation loses real equity on average. Simulation under risk, however, reveals financial problems for the moderate Louisiana operation as well. By 2002, the MOR1900 is losing equity 96 percent of the time while the LAR1100 loses equity 69 percent of the time. The large Missouri (MOR4000) farm is beginning to show signs of financial stress as the probability of losing real net worth increases from 6 percent in 1998 to 33 percent in 2002 (Table 8).

The problem with maintaining real equity is explained by examining the operational parameters on these three farms. Both of the Missouri farms and the Louisiana farm are experiencing cash flow deficits over 87 percent of the time by year 2002. Refinancing from outside sources is necessary more than 99 percent of the time for the moderate Missouri farm, 87 percent for the Louisiana farm and roughly 75 percent of the time for the large Missouri farm (Figures 21 and 22).

Both California farms appear financially sound although there is an upward trend observed in the probability of an annual cash flow deficit (Figure 20). The moderate California (CAR424) farm is experiencing a cash flow deficit 58 percent of the time by 2002, while the large (CAR1365) operation is projected to have a cash flow deficit 39 percent of the time by 2002. Both farms, however, appear to be able to cover their cash flow deficits from retained cash reserves although the moderate California farm has to refinance cash flow deficits 23 percent of the time in 2002.

The large Missouri rice (MOR4000) farm is in better shape compared to its moderate scale counterpart, but there are some warning signs. The MOR4000 is experiencing annual cash flow deficits in excess of 65 percent of the time throughout the period. Initially it is able to cover the cash shortfalls through retained earnings (19% chance of refinancing in 1998) but is having to borrow outside funds roughly 75 percent of the time by 2002. The operational trend, therefore, is troublesome although the farm experiences real net worth declines less than 33 percent of the time (Table 8).

The Texas and Arkansas rice farms are financially sound by most any measure. The only caution being an increasing probability that the large Texas farms will experience cash flow problems (14% in 1998 rising to 38% by 2002).

- During the update process, the Texas and Arkansas farms changed locations within the state. The Texas rice farms are geographically concentrated in what is believed to be the most efficient rice growing area in the Texas rice belt. We now have two Arkansas farms located in the Stuttgart area. Both are larger than our previous panel farm that was located further north. The two Arkansas farms are very efficient as seen by average cash expense to receipt ratios of 66 percent for the ARR2645 and 58 percent for the ARR3400. The Arkansas farms are also the most diversified of our rice panels receiving 50-60 percent of their revenue from rice, 32-38 percent from soybeans, and 8-13 percent from wheat.

Dairy Impacts

- All of the 26 representative dairy farms increase real net worth over the 1996-2002 study period. The annual average increase in real net worth ranges from 0.05 percent on the Central Michigan dairy (MICD140) to over 12 percent on the 700 cow Western New York (NYWD700) and large Central New York dairy (NYCD300) (Figures 24-26). The strong increase in real net worth on the dairy farms is in large part based on the over 40 percent increase in cull cattle prices over the period.

- Only one of the 26 dairies (GAND175) experiences a high (greater than 30 percent) probability of losing real net worth in 1998. But, by 2002 the dairy is able to reduce that probability to 4 percent. On the other hand, the probability of losing real net worth increases from 11 percent in 1998 to 58 percent in 2002 for the Central Michigan dairy (MICD140) (Tables 9-11).

- The combination of low feed prices in the 1997-1999 crop years and high milk prices in 1998 allow the dairies to recover from the reverse situation in earlier years. Net cash farm income sharply rebounds in 1998 (Figures 26-33). Increased receipts allow 5 of the dairies to rebound from negative ending cash reserve positions in 1997 (Tables 9-11). The North Georgia dairy (GAND175) is not able to reverse its cash flow deficit position with a rebound in receipts and incomes.

- Nine (35 percent) of the dairies have a 25 percent or greater probability of a cash flow deficit in 2002. Meaning that expenses and other cash flow requirements exceeded cash receipts in that year.

- Overall, the baseline is favorable for the representative dairy farms. Only two of the dairy farms have greater than a 10 percent chance of losing real net worth in the year 2002 (TXCD400 and MICD140). However, 6 of the 26 dairy farms would lose real net worth if their receipts declined by more than 10 percent (Figures 24-26).

- Risk of negative net cash form incomes are significant for 8 of the 26 dairy farms over the 1999-2002 period (Figures 27-33). The New Mexico (NMD2000), moderate Central Texas (TXCD400), and Eastern Michigan (MIED200) dairies have greater than a 15 percent chance of negative net incomes over the 1999-2002 period. Eight of the dairy farms have greater than a 5 percent chance of negative net cash incomes. Volatile feed and milk prices result in significant income risk for dairy farms.

Beef Cattle Impacts

- The beef cattle outlook is positive due to the upturn in cattle prices projected over the study period. Feeder cattle prices are projected to rise from approximately $61/cwt. in 1996 to $91.98/cwt. in 2002.

- The increase in cattle prices and cheaper feed costs are responsible for projected average annual real increases in net worth of 1.3 to 2.6 percent over the 1996-2002 period for the representative ranches (Table 12 and Figure 35). Despite the positive growth in real net worth, the Wyoming ranch has a 12 percent chance of experiencing a decline in real net worth in year 2002.

- Ending cash reserves grow over the period for the Montana and Colorado ranches. The Wyoming ranch experiences negative ending cash balances throughout the period. On the average, the Missouri beef operation also experiences small cash flow deficits each year of the planning horizon. The probability of refinancing deficits declines for each of the ranches as cattle prices increase through 2002 (Figure 36).

- Net cash farm incomes show substantial improvement over the 1999-2002 period as cattle prices rebound (Table 12 and Figure 36). The Montana and Colorado ranches have larger ending cash positions than the Wyoming ranch and are able to keep the probability of refinancing low.

- The upward trend in cattle prices outpaces inflation and higher feed costs to increase average annual net cash incomes (Figure 36). The risk associated with net cash income is projected to increase due to uncertainty about prices and the compounding of financial problems for operations with low rates of return.

- Nine other representative farms have cattle operations ranging from 25 to 200 cows. Increasing returns from cattle throughout the study period contribute to the bottom line of those representative farms.

Hog Farm Impacts

- Baseline projected hog prices range from $31.74 per cwt. in 1998 to $43.44 per cwt. in 2002.

- All eight representative hog farms experience an increase in real equity over the 1997-2002 period. The annual real equity growth ranges from 1 percent on the moderate Missouri (MOH100) farm to about 8 percent on the ILH750. Annual real equity growth on the large contract farming operation in North Carolina is substantially higher than the other farms at 16 percent (Figure 38).

- All of the hog farms show probabilities of cash flow deficits greater than 60 percent in 1998. The Missouri and Indiana hog farms have a 98 to 99 percent probability of a cash flow deficit in 1998 (Table 13 and Figures 39-40).

- The moderate Indiana farm shows serious signs of financial stress through 2002. Ending cash balances generally decline from 1998-2002, requiring refinancing of the operation. The probability of refinancing increases to 84 percent in 2002. The moderate Missouri hog farm also has negative cash reserves in 1998-2002 and its probability of refinancing deficits is 43 percent in 2002 (Figures 39-40).

- While each farm generates a positive annual change in real net worth a reduction in receipts of less than 3.6 percent would cause a negative real net worth change on 2 of the operations (MOH100 and INH150).

- The risk associated with net cash farm income is projected to increase over the 1998-2002 planning horizon. Recovery in hog prices through 2001 causes net cash incomes to increase, but with greater risk. Six of the 8 representative farms have greater than a 5 percent chance of negative net cash incomes in 1999. The probability of a negative net cash income in 1999 is greater than 20 percent for three of the farms.

- The hog price debacle in 1998 is extremely difficult for the moderate size Missouri and Indiana farms to overcome. The largest farms are better able to survive over the long haul, which suggests continued growth in this sector.

FEED GRAIN FARMS

Iowa

Facilitators

Mr. Jim Patton - Webster County Extension Agent
Dr. William Edwards - Professor and Extension Economist, Iowa State University

Panel Participants

Mr. Phil Naeve
Mr. Larry Lynch
Mr. Don Sandell
Mr. Bob Anderson
Mr. Larry Lane
Mr. Perry Black
Mr. Loren Wuebker
Mr. Dennis Ammen
Mr. John Ricke
Mr. Britt Shelton
Mr. Virgil Gordon
Mr. Merv Berg
Mr. and Mrs. Jim Carver

Nebraska

Facilitators

Mr. Gary Hall - Phelps County Agricultural Extension Agent
Dr. Roger Selley - Extension Farm Management Specialist, University of Nebraska
Mr. Joe Trujillo-University of Missouri-Columbia

Panel Participants

Mr. Frank Hadley
Mr. Gary Robison
Mr. Kerry Blythe
Mr. Brian Johnson
Mr. Tom Schwarz
Mr. Tony Davis
Mr. Johnny Nelson
Mr. Phil High

Missouri

Facilitator

Mr. Parman Green - Farm Management Specialist, University of Missouri - Columbia

Panel Participants

Mr. Larry Davies
Mr. Ron Gibson
Mr. Ron Venable
Mr. Gerald Kitchen
Mr. John Vogelsmeier
Mr. Clifford Lyons
Mr. Ron Linneman
Mr. Glenn Kaiser
Mr. Jack Harriman
Mr. Jim Wheeler

Texas - Northern High Plains

Facilitators

Mr. Robert Harris - Moore County Agricultural Extension Agent
Dr. Steve Amosson - Extension Economist - Management, Texas A&M University

Panel Participants

Mr. Kyle Williams
Mr. Ellis Moore
Mr. Ronnie Williams
Mr. Kerri Cartwright
Mr. Wesley Spurlock
Mr. Marion Garland
Mr. Tom Moore

FEED GRAIN FARMS CONTINUED

Northern Missouri

Facilitator

Mr. Mike Killingsworth - Farm Management Consultant, Maryville, Missouri
Mr. Joe Trujillo-University of Missouri-Columbia

Panel Participants

Mr. Jack Baldwin
Mr. Roger Vest
Mr. Kevin Rosenbohm
Mr. Don Mobley
Mr. Gary Ecker

South Carolina

Facilitator

Mr. Toby Boring - Extension Agricultural Economist, Clemson University

Panel Participants

Mr. Harry DuRant
Mr. John Ducworth
Mr. Tom Jackson
Mrs. Vikki Brogdon
Mr. Leslie McIntosh
Mr. Steve Lowder
Mr. Billy Davis
Mr. John Spann
Mr. Chris Cogdill

Tennessee

Facilitator

Dr. Daryll Ray, Professor, University of Tennessee

Panel Participants

Edwin Alles
Donald Parker
Greg Story
Paul Wengard
Jack Ogg
Doug Schoolfield
Daniel Wengerd
James Yarbro

WHEAT FARMS

Washington

Facilitators

Mr. John Burns - Whitman County Agricultural Extension Agent
Dr. Herb Hinman - Extension Economist, Washington State University

Panel Participants

Mr. Brian Largent
Mr. Bruce Nelson
Mr. Asa Clark
Mr. David Harlow
Mr. Gary Largent
Mr. John Whitman
Mr. Henry Suess
Mr. Randy Suess
Mr. Todd Scholz

North Dakota

Facilitators

Mr. Shawn Vachal - Barnes County Extension Agent
Mr. Dwight Aakre - Extension Associate - Farm Management, North Dakota State University

Panel Participants

Mr. Mike Clemens
Mr. Arvid Winkler
Mr. Wade Bruns
Mr. Jack Formo
Mr. Jim Broten
Mr. Ray Haugen
Mr. Anthony Thilmony
Mr. Leland Guscette
Mr. Greg Shanenko
Mr. Charles Triebold

South Central Kansas

Facilitators

Mr. Gerald Le Valley - Sumner County Agricultural Extension Agent
Mr. Brad Goehring - Sedgwick County Extension Agent
Mr. Steve Westfahl - Sedgwick County Extension Agent
Mr. Fred Delano - Administrator of Farm Management Association Program, Kansas State University

Panel Participants

Mr. Robert White
Mr. Nick Steffen
Mr. Donald Applegate
Mr. Robert Headley
Mr. Dennis Pettigrew
Mr. Joe Allen
Mr. Tim Turek
Mr. David Messenger
Mr. Rae Reusser
Mr. Jim Stuhlsatz

Colorado

Facilitators

Mr. Dennis Kaan - Regional Extension Specialist, Colorado State University
Mr. Don Nitchie - Director, Farm Mgmt/Marketing, Colorado State University Cooperative Extension
Dr. Paul H. Gutierrez - Associate Professor, Colorado State University

Panel Participants

Mr. Terry Kuntz
Mr. Calvin Schaffert
Mr. John Wright
Mr. Cliff Fletcher
Mr. David Foy
Mr. Leland Willeke
Mr. John Hickert
Mr. Marlin E. Snyder
Mr. Bill Rodwell
Mr. Gerry Ohr
Mr. Rick Lewton
Mr. Ken Remington

WHEAT FARMS CONTINUED

Northwestern Kansas

Facilitators

Mr. Scott Docken - Extension Agricultural Economist, Farm Management Association, KSU
Mr. Mark Wood - Extension Agricultural Economist, Farm Management Association, KSU
Mr. Dan Obrien - Extension Agricultural Economist, Farm Management Association, KSU
Mr. Fred Delano - Administrator of Farm Management Association Program, Kansas State University

Panel Participants

Mr. Harold Mizell
Mr. Brian Laufer
Mr. Lee Jueneman
Mr. Lance Leebrick
Mr. Lyman Goetsch
Mr. Gerald Huessman
Mr. Steve Schertz
Mr. Dennis Franklin
Mr. Rich Calliham
Mr. Vernon Akers

COTTON FARMS

California

Facilitator

Mr. Bruce A. Roberts - Kings County Director and Farm Advisor, University of California Cooperative Extension

Panel Participants

Mr. Mark Hansen
Mr. Steve Boyett
Mr. Ernie Taylor
Mr. John Diener
Mr. Jeff Hildebrand
Mr. Wayne Wisecarver
Mr. Craig Pedersen
Mr. Dave Smith
Mr. Bill Tos
Mr. David Costa

Texas - Southern High Plains

Facilitators

Mr. John Farris - Dawson County Agricultural Extension Agent
Dr. Jackie Smith - Extension Economist - Management, Texas A&M University

Panel Participants

Mr. Milton Schneider
Mr. Dave Nix
Mr. Glen Phipps
Mr. Donald Vogler
Mr. Kent Nix
Mr. Mark Furlow
Mr. Mark Boardman
Mr. Lonny Ferguson
Mr. Todd Gregory
Mr. Thomas Holder
Mr. Brad Boyd
Mr. Jerry Chapman

Texas - Rolling Plains

Facilitators

Mr. Todd Vineyard - Ellis County Agricultural Extension Agent
Mr. Stan Bevers - Extension Economist - Management, Texas A&M University

Panel Participants

Mr. Steve Blankenship
Mr. James Seidenberger
Mr. Ronnie Richmond
Mr. Mike Gray
Mr. Glen Gilbreath
Mr. Mark Lundgren
Mr. B.C. Spraberry
Mr. and Mrs. Darrell Richards
Mr. David Cook
Mr. Ronnie Riddle

Texas - Blacklands

Facilitator

Mr. Ronald Leps - Williamson County Agricultural Extension Agent

Panel Participants

Mr. Donald Stolte
Mr. Herbert Raesz
Mr. Doug Schernik
Mr. Bob Bartosh
Mr. Lonny Rinderknecht

Texas - Coastal Bend

Facilitators

Dr. Jeffrey Stapper - San Patricio-Aransas County Extension Agent
Dr. Larry Falconer - Extension Economist - Management, Texas A&M University

Panel Participants

Mr. Brad Bickham
Mr. Clarence Chopelas
Mr. Darby Salge

Tennessee

Facilitator

Dr. Daryll Ray, Professor, University of Tennessee

Panel Participants

Harris Armour, III
Eugene McFerren
Lee Ann Rhea
Tom Karcher
Mark McNabb
Dewayne Hendrix

Travis London Ronald Woods

RICE FARMS

Arkansas

Facilitator

Mr. Bill Free, Riceland Foods, Inc.

Panel Participants

Mr. David Feilkie Mr. Derek Bohanan
Mr. David Jessup

Texas

Facilitator

Dr. Ed Rister - Professor, Texas A&M University

Panel Participants

Mr. W. A. "Billy" Hefner, III Mr. Andy Anderson
Mr. Ronald Gertson Mr. Madison H. Smith
Mr. Jim Wiese Mr. John Waligur
Mr. Glen Rod Mr. Layton Raun
Mr. Kenneth "Peter" Stelzel Mr. Jason Hlavinka
Mr. Steve Balas

California

Facilitator

Mr. Jack Williams - Farm Advisor, Sutter and Yuba Counties, University of California Cooperative Extension

Panel Participants

Mr. Bill Baggett Mr. Frank Rosa
Mr. Jack DeWitt Mr. Wayne Vineyard
Mr. Don Staas Mr. Paul Lower
Mr. Ned Lemenager Mr. Scott Tucker

Missouri

Facilitators

Mr. Bruce Beck - Farmer's Agronomy Specialist, University of Missouri - Columbia
Mr. David Reinbott - Farm Management Specialist, University of Missouri - Columbia
Mr. Joe Trujillo-University of Missouri-Columbia

Panel Participants

Mr. Sonny Martin Mr. Fred Tanner
Mr. Bruce Yarbro Mr. J. D. Sifford
Mr. C. P. Johnson Mr. Mike Mick
Mr. Davis Minton Mr. Rick Spargo
Mr. Floyd Page Mr. Cloyce Sowell
Mr. Dale Conner

Louisiana

Facilitators

Mr. Eddie Eskew - County Agent, Louisiana Cooperative Extension Service
Mr. Howard J. Cormier - County Agent, Louisiana Cooperative Extension Service
Mr. Ronnie Levy - County Agent/Parrish Chairman, Louisiana Cooperative Extension Service
Mr. D. L. Eugene (Gene) Johnson - Specialist in Marketing, Louisiana Cooperative Extension Service, Natural Resources and Economic Development

Panel Participants

Mr. Alden Horten Mr. Brian Wild
Mr. Tommy Faulk Mr. Allan McLain

Mr. Jackie Loewes

DAIRY FARMS

California

Facilitator

Mr. Jack Prince - President, Dairyman's Cooperative Creamery Assoc.

Panel Participants

Mr. Dave Rebeiro
Mr. Phillip Rebeiro
Mr. Bill Van Beek
Mr. Bob Wilbur

New Mexico

Facilitator

Dr. Robert Schwart - Professor and Extension Economist, Texas A&M University

Panel Participants

Mr. Brad Bouma
Mr. Mike McClosky
Mr. Joe Gonzalez
Mr. Von Hilburn
Mr. Tony Bos
Mr. Dean Harton
Mr. Mark Reischman

Washington

Facilitator

Mr. David C. Grusenmeyer - Professor and Extension Dairy Specialist, Washington State University

Panel Participants

Mrs. Star Hovander
Mr. Ron Bronsema
Mr. Keith Boon
Mr. Jim Heeringa
Mr. Rod DeJong
Mr. & Mrs. Pete DeJager
Mr. Dick Bengen
Mr. Greg McKay
Mr. Ed Pomeroy
Mr. Dave Buys

Idaho

Facilitator

Mr. Dean Falk - Extension Dairy Specialist, University of Idaho
Dr. Wilson Grey - Farm Management Specialist - University of Idaho

Panel Participants

Mr. & Mrs. Martin Lee
Mr. Harry Hogland
Mr. Michael Quesnell
Mr. Greg Ledbetter
Mr. Bill Stouder
Mr. Rick Thompson
Mr. John Beukers
Mr. Jack Van Beek
Mr. Adrian Boer
Mr. Reagon Hatch
Mr. Alan Gerratt
Mr. Hank Hafliger
Mr. Randy Tolman

Texas - Central

Facilitator

Mr. Joe Pope - Erath County Agricultural Extension Agent

Panel Participants

Mr. Lane Jones
Mr. Robert Ervin
Mr. Leonard Moncrief
Mr. Bob Strona
Mr. Jack Parks
Mr. Jake Van Vlie
Mr. Owen Sieperda
Mr. Brian Parish

DAIRY FARMS CONTINUED

Texas - Eastern

Facilitator

Mr. Dale Haygood - Zone Manager, Associated Milk Producers, Inc.

Panel Participants

Mr. George Tenberg
Mr. Greg Inman
Mr. Tim Spiva
Mr. Harold Bryant
Mr. Timothy Norris
Mr. Michael Mund
Mr. Hershel Kelsoe
Mr. Larry Ellison
Mr. W.D. Wafford

Missouri

Facilitator

Mr. Ron Young - Christian County Extension Dairy Specialist, Retired

Panel Participants

Mr. John Mallonee
Mr. & Mrs. Doug Owen
Mr. & Mrs. Freddie Martin
Mr. Wayne Whitehead
Mr. Larry Winfree
Mr. Allen Sulgrove
Mr. Dan Clemens
Mr. John Atkinson
Mr. Joe Peebles

Michigan

Facilitator

Mr. Mike McFadden - Extension Dairy Agent - Michigan State University
Dr. Craig Thomas - Extension Dairy Agent - Michigan State University Extension
Mr. Wes Lane - Director- Communications Division - Dairy Farmers of Ontario
Dr. Sherrill Nott - Farm Management Specialist - Michigan State University

Panel Participants

Mr. Tom Fox
Mr. Keith Moeggenberg
Mr. Bob Pasch
Mr. Jim Wilson
Mr. & Mrs. Don Hopper
Mr. Jason Shinn
Mr. Ron McDonald
Mr. Bryan Neyer
Mr. Jerry Varner
Mr. Mike Fagan
Mr. Jim Reid
Mr. Duane Stuever

Florida

Facilitators

Mr. Chris Vann - Lafayette County Agricultural Extension Agent
Mr. Art Darling - Dairy Farms, Inc.

Panel Participants

Mr. Keith Rucks
Mr. Louis Shiver
Mr. Bill Shaw
Mr. Edward Thomas
Mr. Glynn Rutledge
Mr. Rodney Land
Mr. Brad Hester
Mr. Kevin Jackson
Mr. Boyd Rucks
Mr. Everett Kerby
Mr. Tommy Rucks

Georgia

Facilitator

Mr. Bill Thomas - Professor and Extension Economist, University of Georgia

Panel Participants

Mr. Carlton McMichael
Mr. Mike Rainey
Mr. Ronny Parham
Mr. Bill Boyce
Mr. Bernard Sims
Mr. Lamar Anthony
Mr. Earnest Turk
Mr. Raymond Hunter
Mr. Tom Thompson
Mr. Henry Cabaniss

Mr. Terry Embry Mr. Tim Camp

DAIRY FARMS CONTINUED

Wisconsin

Facilitator

Mr. Jeff Key - Winnebago County Agricultural Extension Agent

Panel Participants

Mr. David Allen
Mr. Larry Engel
Mr. Ronald Miller
Mr. Pete Knigge
Mr. Edwin Davis
Mr. Dean Hughes
Mr. Jeff Bradley
Mr. Pat Brennand
Mr. Jeff Meulmans
Mr. Joe Bonlender
Mr. Glenn Armstrong
Mr. Doug Hodorff
Mr. Fred Kasten
Mr. Jerome Schmidt
Mr. Carl Theonis
Mr. Mike Bradley
Mr. Ben Hughes
Mr. Bob Staudinger

New York - Western

Facilitator

Mr. Jason Karszes - Cornell Cooperative Extension Service

Panel Participants

Mr. Gary Van Slyke
Mr. Willard DeGolyer
Mr. George Mueller
Mr. Peter Dueppengiesser
Mr. John Mueller
Mr. Dick Popp
Mr. Bill Fitch
Mr. John Emerling
Mr. Kent Miller

New York - Central

Facilitator

Dr. Wayne Knoblauch - Professor, Cornell University

Panel Participants

Mr. Gary Mutchler
Mr. Bill Head
Mr. David Shurtleff
Mr. & Mrs. Tom Brown
Mr. Ron Space, Jr.
Mr. Mike Learn
Mr. Dale Van Erden

Vermont

Facilitator

Dr. Rick Wackernagel - Professor, University of Vermont

Panel Participants

Mr. Steve Hurd
Mr. Hank Nop
Mr. Steve Ovellette
Mr. Ted Foster
Mr. Reg Chaput
Mr. Onan Whitcomb
Mr. Mark Rodgers
Mr. Kim Harvey
Mr. Everett Maynard
Mr. Stanley Scribner
Mr. Roger Rainville
Mr. Paul Gingue
Ms. Sally Goodrich

BEEF PRODUCERS

Montana

Facilitators

Mr. Olaf Sherwood - Custer County Agricultural Extension Agent
Dr. Alan Baquet - Farm Management Specialist, Montana State University

Panel Participants

Mr. Dee Murray
Mr. Donald Ochsner
Mr. Jean Robinson
Mr. Art Drange

Colorado

Facilitator

Mr. C.J. Mucklow - Routt County Agricultural Extension Agent

Panel Participants

Mr. Doug Carlson
Mr. Dean Rossi
Mr. Charlie Cammer
Mr. Wayne Shoemaker
Mr. Jay Fetcher
Mr. Larry Monger
Mr. Pud Stetson
Mr. Jim Rossi

Wyoming

Facilitators

Mr. Jim Gill, County Extension Agent, Washakie County
Dr. Larry Van Tassell - University of Wyoming

Panel Participants

Mr. Bill Greer
Mr. Gary Rice
Mr. Ray Rice
Mr. Jim Foreman

HOG FARMS

Illinois

Facilitator

Mr. Don Teel - Retired Knox County Agricultural Extension Agent

Panel Participants

Mr. David Hawkinson
Mr. Kevin Maine
Mr. Dale Carlson
Mr. David Bowman
Mr. Mike Hennenfent
Mr. John Gustafson
Mr. Sterling Saline
Mr. Steve Maine
Mr. Don Erickson
Mr. Lance Humphreys
Mr. Bob Hennenfent
Dr. Donald G. Reeder

Indiana

Facilitator

Mr. Steve Nichols - Carroll County Agricultural Extension Agent
Dr. Chril Hurt - Extension Farm Management Specialist - Purdue University

Panel Participants

Mr. Rick Brown
Mr. Larry Trapp
Mr. Sam Zook
Mr. Bill Pickart
Mr. Levi Huffman
Mr. Brad Burton
Mr. Trent Odell
Mr. Mark Martin

Missouri

Facilitator

Mr. Parman Green - Farm Management Specialist, University of Missouri - Columbia

Panel Participants

Mr. Larry Charles
Mr. Dale Miles
Mr. Vernon Thoeni
Mr. John Vogelsmeier
Mr. Herbert Kiehl
Mr. Paul Benedict
Mr. R. David Hemme
Mr. Gary L. Sanders
Mr. Robert S. Mayden
Mr. Matt Reichert
Mr. Richard Clemens

North Carolina

Facilitators

Mr. Mike Regans - Wayne County Agricultural Extension Agent
Dr. Kelly Zering - Associate Professor and Extension Specialist, North Carolina State University
Mr. Jeff Chandler - Wayne County Agricultural Extension Agent

Panel Participants

Mr. Ben Outlaw
Mr. David Harrell Overman
Mr. Charlie McClenny
Mr. Ronald Parks
Mr. David Sanderson
Mr. Frankie Warren
Mr. Jeff Hansen
Mr. John Dawson
Mr. R.H. Mohesky

1999 CHARACTERISTICS OF PANEL FARMS PRODUCING FEED GRAINS

IAG950 A 950-acre Northwestern Iowa (Webster County) moderate size grain farm that plants 475 acres of corn, and 475 acres of soybeans. The farm receives 56 percent of its receipts from corn.

IAG2200 A 2,200-acre Northwestern Iowa (Webster County) large grain farm that plants 1,100 acres of corn, and 1,100 acres of soybeans. The farm generates 58 percent of its receipts from corn.

NEG800 A 800-acre South Central Nebraska (Phelps County) moderate size 100 percent irrigated grain farm that plants 770 acres of corn, and 30 acres of alfalfa. The farm also has 100 breeding cows. The farm generates 87 percent of its receipts from corn.

NEG1575 A 1,575-acre South Central Nebraska (Phelps County) large 100 percent irrigated grain farm that plants 1,575 acres of corn. The farm generates about 97 percent of its receipts from corn.

MOCG1500 A 1,500-acre Central Missouri (Carroll County) moderate size grain farm with 250 acres of wheat, 550 acres of corn, and 700 acres of soybeans. This farm is located in the Missouri river bottom and supplies feed to the livestock producers in the region at a premium to other areas of Missouri. Corn generates 45 percent of the farm's receipts.

MOCG3000 A 3,000-acre Central Missouri (Carroll County) large grain farm with 300 acres of wheat, 1,350 acres of corn, and 1,350 acres of soybeans. This farm is located in the Missouri river bottom and supplies feed to the livestock producers in the region at a premium to other areas of Missouri. The farm generates about 56 percent of its total revenue from corn.

MONG1200 A 1,200-acre Northern Missouri (Nodaway County) diversified grain farm with 525 acres of corn, 525 acres of soybeans, and 150 acres of hay. The farm also has 150 breeding cows and 80 breeding sows. The farm generates about 46 percent of its total revenue from corn and soybeans, 31 percent from hogs, and 22 percent from cattle.

1999 CHARACTERISTICS OF PANEL FARMS PRODUCING FEED GRAINS (CONTINUED)

TXNP1600 A 1,600-acre Northern High Plains of Texas (Moore County) moderate size, 100 percent irrigated, grain farm with 642 acres of wheat, 280 acres of sorghum, 470 acres of corn, and 208 acres fallow. The farm generates 70 percent of its total receipts from feed grains.

TXNP5500 A 5,500-acre Northern High Plains of Texas (Moore County) large, 85 percent irrigated, grain farm with 1,675 acres of irrigated wheat, 800 acres of dryland wheat in the corners of all pivot irrigated fields, 275 acres of irrigated sorghum, 2,200 acres of irrigated corn, and 550 acres fallow. The farm generates about 74 percent of its receipts from feed grains.

TNG900 A 900-acre Western Tennessee (Henry County) grain and soybean farm with 400 acres of corn, 500 acres of soybeans, 200 acres of wheat, and 250 acres of hay. The farm generates about 77 percent of its receipts from corn and soybeans.

TNG2400 A 2,400-acre Western Tennessee (Henry County) grain and soybean farm with 1,200 acres of corn, 1,200 acres of soybeans, and 600 acres of wheat. The farm generates about 87 percent of its receipts from corn and soybeans.

SCG1500 A 1,500-acre South Carolina (Clarendon County) moderate size grain farm with 750 acres of double cropped wheat and soybeans, 600 acres of corn, and 150 acres of full season soybeans. The farm generates about 64 percent of its total receipts from corn and soybeans. This farm enjoys high returns on double cropped acreage but timing will not allow more than 750 acres.

SCG3500 A 3,500-acre South Carolina (Clarendon County) large grain farm with 2,020 acres of double crop wheat and soybeans, 350 acres of cotton, and 1,130 acres of corn. This farm enjoys high returns on double cropped acreage but timing is a limiting factor. The farm generates 57 percent of its receipts from corn and soybeans.

1999 CHARACTERISTICS OF PANEL FARMS PRODUCING WHEAT

WAW1500 A 1,500-acre Southeastern Washington (Whitman County) moderate size grain farm, updated December 1998, that plants 900 acres of wheat, 300 acres of barley, and 300 acres of peas. Disease problems require a rotation that includes a minimum amount of barley and peas to maintain wheat yields. The farm generates 71 percent of its receipts from wheat.

WAW4250 A 4,250-acre Southeastern Washington (Whitman County) large size grain farm, updated December 1998, that is harvesting 2,763 acres of wheat, 200 acres of barley, and 1,287 acres of peas. Disease problems require a rotation that includes a minimum amount of barley and peas in order to maintain wheat yields. Winter and spring wheat account for 77 percent of receipts.

NDW1760 A 1,760-acre South Central North Dakota (Barnes County) moderate size grain farm, updated February 1999, that has 704 acres of wheat, 176 acres of barley, 176 acres of corn, 352 acres of soybeans, and 352 acres of sunflowers. Rotation and disease problems will not allow more than 25 percent of the acres to be planted to sunflowers. The farm receives about 41 percent of receipts from wheat.

NDW4850 A 4,850-acre South Central North Dakota (Barnes County) large grain farm, updated February 1999, that plants 2,585 acres of wheat, 470 acres of barley, 705 acres of soybeans, 940 acres of sunflowers, and 150 acres of CRP. Rotation and disease problems will not allow more than 25 percent of the acres to be planted to sunflowers. Wheat accounts for about 50 percent of the farms total gross receipts.

KSSW1385 A 1,385-acre South Central Kansas (Sumner County) moderate size grain farm, updated February 1999, that plants 928 acres of wheat, 138 acres of soybeans, and 319 acres of grain sorghum. The farm generates about 63 percent of its receipts from wheat.

KSSW3180 A 3,180-acre South Central Kansas (Sumner County) large grain farm, updated in February 1999, harvesting 2,258 acres of wheat, 652 acres of grain sorghum, 56 acres of corn, 87 acres of soybeans, and 127 acres of hay. The farm also has 67 breeding cows. The farm generates 67 percent of its receipts from wheat.

KSNW2325 A 2,325-acre North Western Kansas (Thomas County) moderate size grain farm, updated January 1999, that plants 775 acres of wheat, 155 acres of grain sorghum, 620 acres of corn, and has 775 acres of fallow. The farm generates 38 percent of its receipts from wheat.

KSNW4300 A 4,300-acre North Western Kansas (Thomas County) large grain farm, updated January 1999, harvesting 1,948 acres of wheat, 465 acres of sorghum, 549 acres of corn, 262 acres of sunflowers, 75 acres of hay, and 1,001 acres of fallow. The farm also has 100 breeding cows. The farm generates about 45 percent of its receipts from wheat.

COW2700 A 2,700-acre Northeast Colorado (Washington County) moderate size grain farm, updated January 1999, that plants 1,127 acres of wheat, 608 acres of millet, and 446 acres of corn, and will leave 519 acres fallow. The farm generates 52 percent of its receipts from wheat.

COW5420 A 5,420-acre Northeast Colorado (Washington County) large size grain farm, updated in

January 1999, that plants 1,900 acres of wheat, 500 acres of corn, 1,300 acres of millet, 640 acres of CRP, and 1,100 acres in fallow. Wheat produces 59 percent of the farms gross revenue.

1999 CHARACTERISTICS OF PANEL FARMS PRODUCING COTTON

CAC2000 A 2,000-acre Central San Joaquin Valley California (Kings County) moderate size cotton farm that plants 1,100 acres of cotton, 300 acres of wheat, 300 acres of corn, and 300 acres of hay. The farm generates 64 percent of its gross income from cotton.

CAC6000 A 6,000-acre Central San Joaquin Valley California (Kings County) large cotton farm harvesting 3,000 acres of cotton, 1,500 acres of vegetables, 720 acres of wheat, 240 acres of corn, and 300 acres of hay. Vegetables on this farm vary from year to year depending on the price of the particular vegetable, however, the returns to this 1,500 acres remain relatively stable over time. Cotton generates about 69 percent of this farm's receipts.

TXSP1682 A 1,682-acre Texas Southern High Plains (Dawson County) moderate size cotton farm, updated December 1998. The farm plants 1,185 acres of cotton (886 dryland and 319 irrigated), 196 acres of peanuts, and has 183 acres in CRP. This farm is just now starting to adopt the irrigation practices of its larger counterpart. The farm generates 62 percent of its receipts from cotton.

TXSP3697 A 3,697-acre Texas Southern High Plains (Dawson County) large cotton farm, updated December 1998. The farm plants 2,665 acres of cotton (2,095 dryland and 570 irrigated), 285 acres of peanuts, and has 214 acres in CRP. Cotton generates 74 percent of this farms receipts.

TXRP2500 A 2,500-acre Texas Rolling Plains (Jones County) cotton farm that plants 1,240 acres of cotton, and 825 acres of wheat. The farm also has 25 breeding cows and uses the wheat acreage to graze the cattle in the winter. About 74 percent of this farms receipts are derived from cotton. This farm represents the consolidation of two previous representative farms.

TXBL1400 A 1,400-acre Texas Blacklands (Williamson County) moderate size cotton and grain farm, updated February 1999, the farm has 350 acres of cotton, 400 acres of sorghum, 550 acres of corn, and 100 acres of wheat. This farm also has 50 breeding cows which are pastured on rented land that cannot be cropped. Cotton generates 38 percent of the farms receipts.

TXCB1700 A 1,700-acre Texas Coastal Bend (San Patricio County) cotton farm, updated January 1999. The farm has 765 acres of cotton, and 935 acres of grain sorghum. Severe disease problems force this farm to plant at a minimum 50 percent of the land to grain sorghum. About 67 percent of this farm's receipts are cotton receipts.

TNC1675 A 1,675-acre Southwest Tennessee (Fayette County) cotton farm, developed in 1998, with 838 acres of cotton, 670 acres of soybeans, and 168 acres of corn. The farm generates about 68 percent of its cash receipts from cotton.

TNC3800 A 3,800-acre Southwest Tennessee (Haywood County) cotton farm, developed in 1998, with 2,508 acres of cotton, 760 acres of soybeans, 300 acres of wheat, and 532 acres of corn. The farm generates about 77 percent of its cash receipts from cotton.

1999 CHARACTERISTICS OF PANEL FARMS PRODUCING RICE

CAR424 A 424-acre Sacramento Valley California (Sutter and Yuba Counties) moderate size rice farm that plants 400 acres of rice. The farm generates 94 percent of its gross income from rice.

CAR1365 A 1,365-acre Sacramento Valley California (Sutter and Yuba Counties) large rice farm that plants 1,265 acres of rice. The farm generates about 98 percent of its gross income from rice.

TXR2118 A 2,118-acre West of Houston, Texas (Wharton County) moderate size rice farm that harvests 600 acres of first crop rice, and 510 acres of ratoon rice. The farm receives 98 percent of its gross receipts from rice.

TXR3750 A 3,750-acre West of Houston, Texas (Wharton County) large rice farm that harvests 1,500 acres of first-crop rice, 1,275 acres of ratoon rice, and 200 acres of hay. The farm also has 200 breeding cows. About 95 percent of the farm's gross receipts are from rice.

MOR1900 A 1,900-acre Southeastern Missouri (Butler County) moderate size rice farm with 616 acres of rice, 650 acres of soybeans, and 633 acres of corn. Rice accounts for 52 percent of this farms receipts.

MOR4000 A 4,000-acre Southeastern Missouri (Butler County) large rice farm with 1,710 acres of rice, 800 acre soybeans, 1,250 acres of corn, and 240 acres of cotton. About 59 percent of this farm's receipts are generated from rice.

ARR2645 A 2,645-acre Arkansas (Arkansas County) moderate size rice farm with 175 acres of medium grain rice, 512 acres of long grain rice, 958 acres of soybeans, 230 acres of corn, and 450 acres of wheat. About 54 percent of the farms receipts come from rice.

ARR3400 A 3,400-acre Arkansas (Arkansas County) moderate size rice farm with 325 acres of medium grain rice, 975 acres of long grain rice, 1,700 acres of soybeans, and 500 acres of wheat. About 65 percent of the farms receipts come from rice.

LAR1100 A 1,100-acre Louisiana (Jefferson Davis, Acadia, and Vermilion Parishes) moderate size rice farm harvesting 189 acres of medium grain rice, 351 acres of long grain rice, 362 acres of soybeans, and 198 acres of fallow. About 85 percent of this farm's receipts are generated by rice.

1999 CHARACTERISTICS OF PANEL FARMS PRODUCING MILK

CAD1710 A 1,710-cow Central California (Tulare County) large dairy farm that produces 21,800 pounds of milk per cow. The farm plants 200 acres of hay, and 325 acres of silage for which it employs custom harvesting. Milk receipts generate 93 percent of all receipts.

NMD2000 A 2,000-cow Southern New Mexico (Dona Anna and Chaves County) large dairy farm that averages 22,400 pounds per cow. Rather than plant any crops, this farm purchased all commodities necessary for blending its own total mixed ration. Milk sales account for 93 percent of cash receipts.

WAD185 A 185-cow Northern Washington (Whatcom County) moderate size dairy farm that produces 25,500 pounds of milk per cow. The farm plants 115 acres of silage and generates 97 percent of its receipts from milk.

WAD850 A 850-cow Northern Washington (Whatcom County) large dairy farm that produces 23,500 pounds of milk per cow. The farm plants 505 acres of silage and generates 96 percent of its receipts from milk.

IDD500 A 500-cow Idaho (Twin Falls County) moderate size dairy farm that produces 21,000 pounds of milk per cow. The farm plants 120 acres of hay and 183 acres of silage. Milk is 88 percent of the farms gross income.

IDD1800 A 1,800-cow Idaho (Twin Falls County) large dairy farm that produces 21,000 pounds of milk per cow. The farm plants 156 acres of hay and 398 acres of silage. Milk is 93 percent of the farms gross income.

TXCD400 A 400-cow Central Texas (Erath County) moderate size dairy farm that produces 16,100 pounds of milk per cow. The farm plants 120 acres of hay and 183 acres of silage. Milk is 93 percent of the farms gross income.

TXCD825 A 825-cow Central Texas (Erath County) large dairy farm that produces 19,200 pounds of milk per cow. The farm plants 430 acres for silage, 20 acres of haylage, and milk accounts for 94 percent of receipts.

TXED210 A 210-cow East Texas (Hopkins County) moderate size dairy farm that produces 16,000 pounds of milk per cow. The farm plants 195 acres of hay and generates 88 percent of its receipts from milk.

TXED650 A 650-cow East Texas (Lamar County) large dairy farm that produces 17,000 pounds of milk per cow. The farm plants 140 acres of hay and 360 acres of silage. The farm generates 91 percent of its receipts from milk.

1999 CHARACTERISTICS OF PANEL FARM PRODUCING MILK (CONTINUED)

WID70 A 70-cow Eastern Wisconsin (Winnebago County) moderate size dairy farm that produces 20,500 pounds of milk per cow. The farm plants 37 acres of hay, 45 acres of corn, 24 acres of silage, and 89 acres of haylage. Milk makes up 90 percent of this farm's receipts.

WID600 A 600-cow Eastern Wisconsin (Winnebago County) large dairy farm that produces 19,800 pounds of milk per cow. The farm plants 350 acres of corn, 200 acres of silage, and 450 acres of haylage. Milk accounts for 91 percent of the farm's receipts.

MIED200 A 200-cow Michigan (Sanilac County) moderate size dairy farm that produces 22,000 pounds of milk per cow. The farm plants 220 acres of corn, 50 acres of wheat, and 170 acres of silage. Milk accounts for 93 percent of the farm's receipts.

MICD140 A 140-cow Michigan (Isabella County) moderate size dairy farm that produces 20,300 pounds of milk per cow. The farm plants 175 acres of corn, 70 acres of hay, 65 acres of silage, and 110 acres of haylage. Milk accounts for 88 percent of the farm's receipts.

NYWD700 A 700-cow Western New York (Wyoming County) moderate size dairy farm that produces 22,700 pounds of milk per cow. The farm plants 535 acres of silage and 450 acres of haylage. About 93 percent of the farm's receipts come from milk.

NYWD1200 A 1,200-cow Western New York (Wyoming County) large dairy farm that produces 21,700 pounds of milk per cow. The farm plants 825 acres of silage and 700 acres of haylage. Milk accounts for 94 percent of the farm's receipts.

NYCD110 A 110-cow Central New York (Cayuga County) moderate size dairy farm that produces 22,000 pounds of milk per cow. The farm plants 49 acres of hay, 75 acres of corn, 78 acres of silage, and 84 acres of haylage. Milk accounts for 93 percent of the farms receipts.

NYCD300 A 300-cow Central New York (Cayuga County) large dairy farm that produces 21,500 pounds of milk per cow. The farm plants 170 acres of hay, 142 acres of corn, 190 acres of silage, and 298 acres of haylage. The farm generates 93 percent of its receipts from milk.

VTD85 A 85-cow Vermont (Washington County) moderate size dairy farm that averages 22,400 pounds of milk per cow. The farm plants 60 acres of hay, 58 acres of silage, and 70 acres of haylage. Milk accounts for 90 percent of the receipts.

VTD350 A 350-cow Vermont (Washington County) large dairy farm that averages 22,000 pounds of milk per cow. The farm plants 205 acres of hay, 200 acres of silage, and 177 acres of haylage. Milk accounts for 95 percent of the farm's receipts.

1999 CHARACTERISTICS OF PANEL FARM PRODUCING MILK (CONTINUED)

MOD85 A 85-cow Southwestern Missouri (Christian County) moderate size dairy farm that averages 15,600 pounds of milk per cow. The farm plants 220 acres of hay. About 88 percent of the farm's receipts come from milk.

MOD300 A 300-cow Southwestern Missouri (Christian County) large dairy farm that averages 17,300 pounds of milk per cow. The farm plants 578 acres of hay and 107 acres of silage. Milk accounts for 94 percent of this farm's receipts.

GAND175 A 175-cow Central Georgia (Putnam County) moderate size dairy farm that produces 18,000 pounds of milk per cow. Rather than plant any crops, this farm opts to purchase all of its feed requirements in the form of a premixed ration. Milk accounts for 94 percent of the farm's gross income.

GASD650 A 650-cow Southern Georgia (Houston County) large dairy farm that produces 19,000 pounds of milk per cow. The farm plants 150 acres of hay and 400 acres of silage. Milk makes up 94 percent of the farm's receipts.

FLND380 A 380-cow North Florida (Lafayette County) moderate size dairy farm that averages 17,000 pounds of milk per cow. The farm grows 200 acres of hay. All feed requirements, in addition to hay, are met through a purchased pre-mixed ration. Milk sales account for 93 percent of the farm's receipts. Excess hay sales provide one percent of cash receipts and are expected to provide supplemental sales from year to year.

FLSD2000 A 2,000-cow South Central Florida (Okeechobee County) large dairy farm that produces 16,500 pounds of milk per cow. The farm grows 1,210 acres of hay. In addition to grass hay, grass silage, and pasture, cows receive a purchased premixed ration. Milk sales generate 92 percent of its receipts.

1999 CHARACTERISTICS OF PANEL FARMS PRODUCING BEEF CATTLE

MTB400 A 400-cow ranch located in the eastern plains of Montana (Custer County). The ranch runs cows on a combination of owned, federal, state, and private lease land. One quarter of its total animal unit month grazing needs come from federal land and the ranch owns 14,000 acres of pasture. Of the total land owned, 440 acres are planted for hay. Cattle generates 100 percent of the total receipts on the ranch.

WYB300 A 300-cow ranch located in North Central Wyoming (Washakie County). The ranch harvests hay from 200 acres of owned cropland, and it owns another 1000 acres of pastureland. Rangeland leased from the Forest Service provides 42 percent of the ranch's grazing needs. Cattle generates 100 percent of the total receipts on the ranch.

COB300 A 300-cow ranch located in Northwest Colorado (Routt County). Federal land provides 7 percent of the ranch's AUM needs. Hay is produced on 400 acres of the pasture-hay land, of which the ranch owns 300. The ranch owns 1800 acres of pastureland, and the cattle graze the federal land during the summer months. Cattle generates 90 percent of the total receipts on the ranch. This ranch participates in a retained ownership program through the feedlot with 75% of the steers raised.

MOB150 A 150-cow farm in Southwest Missouri (Dade County). The farm generates 57 percent of its receipts from beef cattle and the remainder from crops. The farm has 80 acres of sorghum, 160 acres of soybeans, 80 acres of wheat, and 400 acres of hay. Surplus hay sales make up only 6 percent of cash receipts.

OTHER Nine other representative farms have beef cattle operations in conjunction with their crop production (NEG800, MONG1200, TNG1300, KSSW3180, KSNW4300, TXRP2065, TXBL1200, TXR3750, and MOH100). These farming operations have from 25 to 200 mother cows in their cow/calf herds and cattle provide from 4 to 22 percent of the receipts on these farms.

1999 CHARACTERISTICS OF PANEL FARMS PRODUCING HOGS

MOH100 A 100-sow hog farm located in North Central Missouri (Carroll County). The farm plants 160 acres of corn, 80 acres of soybeans, 80 acres of wheat, and 40 acres of hay. The farm weans 16 pigs per sow in a year and has a feeding efficiency measure of 3.4 pounds of feed per pound of pork sold. Hogs generate 77 percent of the farm's total receipts while crops produce another 17 percent of receipts.

MOH225 A 225-sow hog farm located in North Central Missouri (Carroll County). The farm plants 400 acres of corn, 400 acres of soybeans, and 200 acres of wheat. This farm feeds 3.7 pounds of feed for every pound of pork sold and averages 19 pigs weaned per sow per year. The hog enterprise generates about 78 percent of the total receipts for the farm. The remainder of total receipts is generated in crop sales.

ILH200 A 200-sow hog farm located in Western Illinois (Knox County). The farm plants 750 acres of corn, 610 acres of soybeans, and 20 acres of wheat. This farm weans 17 pigs/sow/year and operates on 3.5 pounds of feed per pound of pork sold. The hog operation produces about 57 percent of the farm's total receipts while the sale of crops accounts for about 40 percent.

ILH750 A 750-sow hog farm located in Western Illinois (Knox County). The farm plants 1080 acres of corn and 720 acres of soybeans. This farm will wean an average of 22 pigs per sow in a year, and feeds about 3.1 pounds of feed per pound of pork sold in a year. The hog enterprise generates 86 percent of the total receipts on the farm. Corn and soybean sales account for the remaining 14 percent.

INH150 A 150-sow hog farm located in North Central Indiana (Carroll County). The farm plants 750 acres of corn, 225 acres of soybeans, and 25 acres of wheat. The farm feeds 3.3 pounds of feed per pound of pork sold and weans 17 pigs/sow/year. About 54 percent of the farm's receipts comes from hogs, and the remainder of receipts is generated through crop sales.

INH600 A 600-sow hog farm located in North Central Indiana (Carroll County). The farm plants 1,500 acres of corn, 700 acres of soybeans, and 50 acres of wheat. The farm is able to wean 20 pigs per sow per year and feed 3.3 pounds of feed per pound of pork sold. The hog operation accounts for approximately 71 percent of the farm's total receipts. The other quarter of receipts comes from crop sales.

NCH350 A 350-sow hog farm located in Eastern North Carolina (Wayne County). The farm plants 100 acres of hay to dispose of waste from the farrow-to-finish hog operation, but does not plant any crops for feed. All feed for the operation is purchased. The farm will wean 19.5 pigs per sow per year and will feed 3.0 pounds of feed per pound of pork sold. The sale of hogs produces 100 percent of the farm's receipts.

NCH13268 A 13,268-sow hog farm located in Eastern North Carolina (Wayne County). The operation contracts with individual farmers who provide on-site management, labor, and facilities. The operation provides hogs, purchased feed and specialized labor for its group of contract farrowing, nursery and finishing farms. On average the farm will wean 20 pigs per sow per year. A measure of feed efficiency for this operation is 2.9 pounds of feed

per pound of pork sold. 100 percent of the farm's receipts are produced from the sale of hogs.

APPENDIX B:

LIST OF PANEL FARM COOPERATORS

APPENDIX A:

CHARACTERISTICS OF REPRESENTATIVE FARMS