

Representative Farms

Financial Analysis of Missouri Broiler-Beef Farms

FAPRI-UMC Report #07-02
July 11, 2002

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Introduction

Broilers are a major contributor to Missouri's agriculture economy. USDA estimates that Missouri marketed 240 million broilers in 2000 with a value of \$356 million—nearly 8 percent of the state's cash receipts from all agricultural commodities. Broilers rank sixth behind cattle, soybeans, corn, hogs, and hay in value of production and provide about 960 full-time jobs in the direct care of flocks. The regional impact is magnified in the relatively few counties where broiler production is concentrated.

While these numbers are important economic indicators, they say nothing about farm-level income or the financial performance of broiler operations. In fact, public data on broiler farms is relatively scarce and the limited data available is sometimes prone to misinterpretation due to the integration of the industry. For example, one should be careful not to confuse the value of production with cash receipts earned by growers for their share of the production process. Growers actually receive a small fraction of the \$1.48 per bird value noted above.

This analysis focuses on the farm-level financials of broiler farms as they are operated in Missouri, specifically in the four southwest corner counties of McDonald, Newton, Barry, and Lawrence. Features unique to broiler operations will be highlighted, including an assessment of some risks. This study is intended to increase understanding of a vital part of Missouri's agriculture while respecting internal business of the growers and the integrators.

Representative Farms

Primary data for this analysis was developed by two independent panels consisting of growers and representatives of integrator firms. By consensus, each panel has developed detailed financial, production, and environmental information to create a model farm that represents the operations of the growers as a group; hence the term "representative farm". Since initiation in 1998, the broiler panels have met regularly to refine and update data for simulation. FAPRI works with more than 40

other panels across the state, each with unique characteristics and enterprise combinations.

Basic characteristics of the representative farms are shown in Table 1. Imbedded in the model farms are real world production and waste management practices that form integrated systems. Simulations are adjusted to capture local conditions. For example, production flow, asset values, building repairs, machinery lists and replacement schedules, specific contract terms, credit terms, and adjustments for weather events are unique for each farm. Many of these factors get masked in the summarized presentation of financial statements, but they underlie all the calculations. The farms contract with different integrators and thus have different terms in the base contract. The smaller farm is paid more per bird, but earns less per house because of differences in bird size, turnover, and housing capacity. The larger farm owns and operates all of the forage handling equipment whereas the smaller farm owns relatively little machinery and has the hay crop custom harvested. Both farms sell about one-third of their hay production as a cash crop.

Table 1. Key characteristics of representative broiler farms.

Characteristic	Farm A	Farm B
Broiler houses (number)	6	4
Annual broiler sales (number of birds)	868,000	504,000
Farm location (counties)	Lawrence & Barry	McDonald & Newton
Total acres operated	160	200
Acres cash leased	40	0
Fescue grass hay (acres)	65	40
Fescue grass seed (acres)	65	0
Cow-calf enterprise (number of cows)	50	50

Actual historical data is used for the pre-2002 period. For example, growers experienced abnormally high heating fuel costs in the winter of 2000-01, which were partially offset by the integrators. To simulate the farm forward through time, prices, costs and market values are adjusted using FAPRI's long-range baseline estimates (Jan 2002). Each panel reviews the results of the baseline output and makes modifications as necessary prior to using the representative farm in analysis.

The objective of this project is to set a baseline of financial performance for existing farms as opposed to individual enterprises. Thus, analysis is conducted on a whole-farm, cash basis. Since growers on the panels integrate cow-calf operations with their broiler units, the representative farm analysis lumps beef and forage/seed enterprises with the broiler enterprise.

Caveat Lector

The financials in this report bear a strong resemblance to many farm businesses and are therefore useful for public discourse. But, since these data are not pulled from a single source it is not legitimate to presume the data represent any particular operation. The reader is further cautioned to not stretch the analysis beyond its capability and draw conclusions concerning the profitability of various alternatives, such as one type of broiler farm in comparison to the other. Nor is it appropriate to make broad generalizations about the industry at large based solely on these data.

Two Business Phases, Two Simulation Scenarios

Broiler farms typically experience two distinct phases of business growth. Through the first phase the farm is characterized by a period of high debt and opportunities for reducing income tax liability via interest and depreciation deductions. The second phase begins when the loan is paid off. The end of the depreciation recovery period may or may not coincide with loan payout.

In the mid to late 1990s (a period of rapid growth in broiler units in Missouri) broiler housing loans were typically set up on a 10-year term. It was a common practice for established farms to receive guaranteed loans of 100 percent for the broiler units. Equity in farmland or other assets was held as collateral and loans were assigned as they are now with a percentage of the broiler payment being received directly by the lender. It has also been reported that many of the original 10-year loans were extended because of the inability of farms to meet cash needs. Recently, it has become common practice for growers and lenders to establish 15-year loans on new facilities. Tax rules permit broiler units to be depreciated over a 10 or 15-year recovery period.

For this analysis, two scenarios were chosen for 2000-2009 simulations with the following assumptions. The first scenario assumes business start-up in 1995 with a 10-year loan and a 10-year depreciation recovery period. This scenario allows the simulation to span both business phases and is in keeping with history and information provided by the representative farm panel members. Initial debt on broiler facilities was set to 75 percent because our preliminary analysis indicated that this amount approached a ceiling for positive cash flow in phase one. Ending balance sheets for the current year are shown in Table 2. The second scenario assumes start-up in 2000 with 100 percent financing of broiler facilities, a 15-year loan life, and a 15-year recovery period.

Table 2. Balance sheets, year-end 2002. 1995 startup.

	Farm A	Farm B
Assets		
Current	\$472	\$3,727
Intermediate	111,658	81,635
Longterm	674,127	561,216
Total Assets	\$786,257	\$646,578
Liabilities		
Current	1,790	0
Intermediate	14,610	14,793
Longterm	114,993	76,662
Total Liabilities	\$131,393	\$91,455
Equity	\$654,864	\$555,122

Further assumptions are common to both simulations. We begin the simulation period (2000) with no cash and no current liabilities. It is assumed that all other farm assets (land, cattle, and equipment) are owned debt free in 2000. Implicit in this assumption for scenario one is that the farm has operated a broiler enterprise for five years, keeping current with all debt obligations but building no cash. For scenario two, this assumption portrays an established, debt-free cow-calf farm that is adding broilers as a new enterprise.

Side by Side

Tables 2 and 3 summarize how the financials are projected to play out for both farms in the current year (2002) under scenario one, that is, the last half of phase one. At the completion of eight years of production, total debt is 17 percent of assets for the 6-house farm and 14 percent for the 4-house farm.

The selected accounting variables in Table 3 give a measure of detail of how cash flows through the business. Note that the cash flow statement consolidates farm income with a modest off-farm salary (\$25,000 in 2000), which is offset by an equal family living withdrawal. This is a typical scenario of one spouse working off the farm to generate family living expenses and employee benefits while the other spouse is fully employed on the farm. Little compensation remains for the operator in this phase. See the discussion below for cash generated under phase two.

It's clear from these data that taxes are a substantial part of cash outflow for broiler operations. As a general principle, broiler farms can expect to pay more income tax as a share of receipts compared to more independent farms because there are fewer business expense deductions to claim against receipts.

Assuming a "family-of-four" sole proprietorship and off-farm income as noted, Farm A will pay 9.7 percent of farm receipts in state and federal income taxes in 2002. After loan payout (not shown), calculated income tax payments in years 2006-09 average \$38,263 or 19.4 percent of receipts.

Long-range Projections

In the following charts financials are summarized in three key variables. The difference between farm receipts and farm expenses is net cash farm income (NCFI). NCFI plus off-farm salary yields cash available for reducing debt, replacing machinery, paying income taxes, and family living expenses. The remaining balance, if any, is cash reserve that accumulates and is carried forward. In this analysis, cash reserve is the measurement of wealth generated by the farm. Refer to Table 3 for an example of how amounts are derived. Note that the charts project no variability in production and assume that future payments per bird equal the 2002 base contract. This assumption is relaxed below.

Table 3. Modified cash flow statement, 2002. 1995 startup.

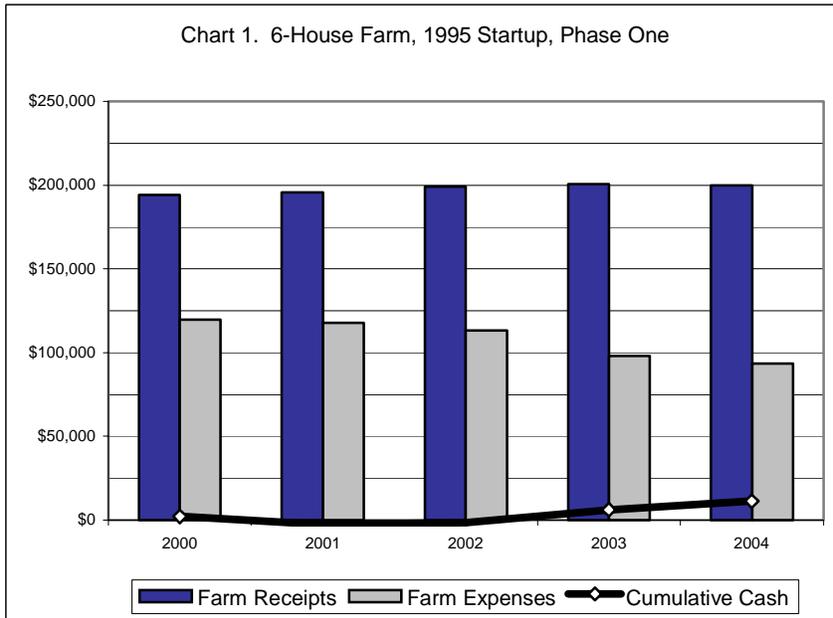
	Farm A	Farm B
Beginning cash	\$0	\$142
Forage crop receipts	5,742	2,124
Cow-calf receipts	25,038	25,354
Broiler receipts	168,431	104,125
Total farm receipts	199,211	131,603
Direct crop expenses	2,495	1,421
Direct cow-calf expenses	3,225	3,045
Direct broiler expenses ¹	70,536	45,116
Unallocated farm expenses ²	21,758	15,324
Interest expenses	15,089	9,157
Total farm expenses	113,103	74,063
Net cash farm income	\$86,108	\$57,540
Off-farm salary & int. earned	26,169	26,173
Cash available	112,277	83,713
Principal payments ³	56,931	37,060
Family withdrawals	26,268	26,268
Fed taxes	14,182	6,734
MO taxes	5,295	3,541
Employment taxes	11,393	6,526
Total cash needs	114,069	80,129
Annual cash surplus	\$827	\$3,584
Cumulative cash reserves	-1,790	3,727

Depreciation deduction	-71,996	-53,308
Net farm income	14,113	4,233
Schedule F net farm profit	\$84,649	\$49,349

¹ Broiler production expenses include litter, propane, electricity, power fuel, supplies, and broiler facility maintenance.

² Unallocated farm expenses include rent, hired labor, RE and property taxes, insurance, general farm fuel, accounting services, and general farm maintenance.

³ Loans for broiler housing primarily, but also new borrowing for machinery replacement and carryover cash deficits, if any.



For the 6-house farm in phase one (Chart 1), projected receipts increase through 2004 due primarily to a new base contract price beginning in 2002 and to a lesser degree a gradual increase in cattle prices. Expenses are highest in 2000-2003 due to the spike in heating fuel costs mentioned earlier and major upgrades of broiler equipment and housing, one-half of the renovation costs incurred in year 7 and one-half in year 8. In 2001 the farm experiences a cash flow deficit of \$4,729, which more than offsets gains from the previous year.

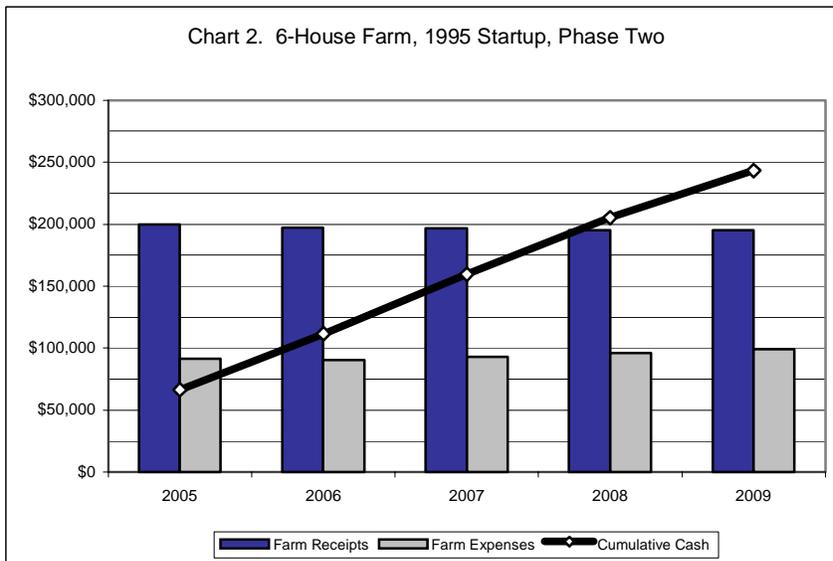


Chart 2 depicts the same farm in years 11-15, post loan payout. Maintaining the assumptions about salary and family living, the farm generates surplus cash at an annual average rate of \$46,432. By the end of year 15 (2009), the farm is projected to have accumulated \$243,389. Corresponding figures for the 4-house farm are \$29,482 and \$163,442. Obviously, the family and/or business will find uses for surplus cash as it accumulates.

Charts 3 and 4 use the same representative farm data, but the assumptions are as outlined under scenario 2 to depict financial performance with a start-up in 2000. The farms generate wealth in the early years of the broiler enterprise until housing renovation occurs in years 7 and 8.

expenses and the timing of the renovations swamp the farm's cash flow. The average annual accumulation of cash through the end of the decade is a negative \$3,356. An off-farm source of cash is needed to support farm expenses.

For the 6-house farm, cash reserve peaks in 2005 at \$79,326. This is equivalent to the owner-operator earning \$13,221 annually the first six years of broiler production, although cash flow is irregular. After 2005, with no adjustment in the contract price, escalating

The same pattern applies to the 4-house farm with reserves peaking at \$52,252. Average annual earnings are \$8,708 through 2005. After the peak, the annual cash deficit is \$3,247. There are some obvious implications for cash flow planning indicated in these charts.

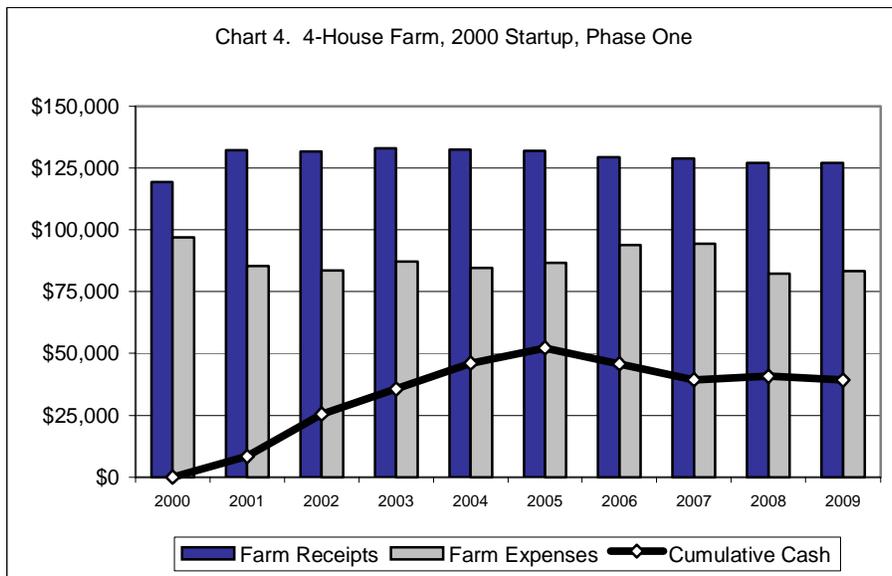
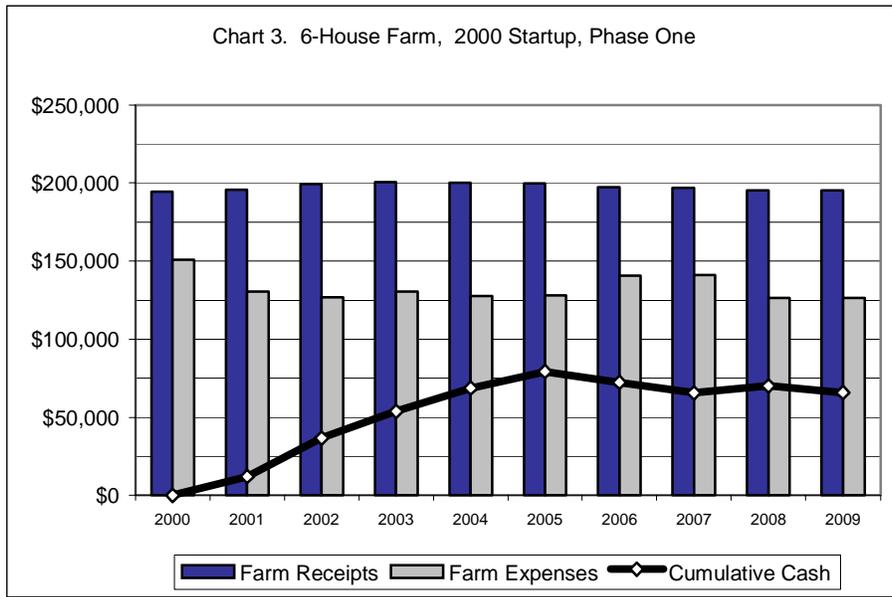


Table 4 indicates the disposition of farm debt over the same period. Recall that the only debt assumed is for broiler housing. Broiler farms

typically have a greater capacity to handle debt and carry more than many other types of enterprises, such as crop or cow-calf only farms.

	2000	2002	2004	2006	2008
6-House Farm	0.672	0.598	0.532	0.467	0.404
4-House Farm	0.576	0.515	0.456	0.403	0.330

Price and Production Risk

Analysis to this point projects financial performance provided beef, forage, and broiler production hold constant through time and future prices materialize as projected. These assumptions are normally accepted even when they are not regarded as a true representation of the future. The following analysis tests these assumptions and estimates price and production risk to the farms.

This approach measures the likelihood that events will unfold to cause the future to deviate from the performance estimates—based on historical price and production interactions. Future production will

be affected by good or poor weather, the presence of diseases, pests, etc. The model captures variance in production levels for several variables, such as, calf crop, sale weight of calves, hay and/or seed production, number of flocks per year, bird weight, death and condemnation rates. Price variability is captured for forage crops, cows and calves, cow-calf feed supplements, and broiler production costs (settlement price). Extremes in production management are not modeled, but the analysis does account for variances within a range considered to be normally experienced within the population of growers. To quantify risk, 100 price and production combinations are simulated with the model.

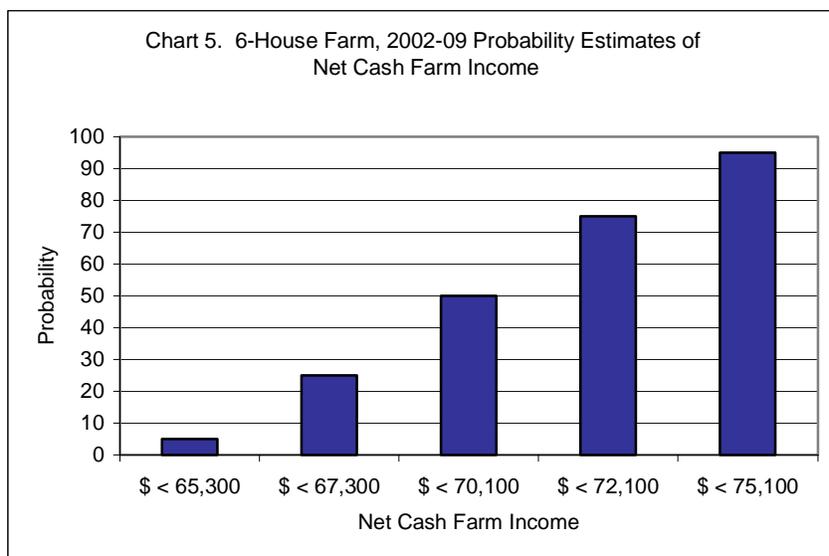


Chart 5 presents the risk results for the 6-house farm. Probability estimates are plotted against future net cash farm income (average of annual NCFI, 2002-2009). For example, the farm faces a 50 percent probability that NCFI will be less than \$70,100. There is a 5 percent probability that NCFI will be less than \$65,300 and a 95 percent chance that it will be less than \$75,100, or a 90 percent probability that NCFI will be between these two data points. Since the estimated amount of NCFI needed to cover

expenses not supported by off-farm salary is \$61,660, we can also say there is an extremely low probability that price and production will combine to cause negative cash flow for the period.

Overall, this is a rather narrow range of potential NCFI income levels. While risks from disease, weather events, and irregular management are still a part of the business, technological advances and integration have made poultry production much more predictable than it once was and generally more predictable than other types of agricultural production. While contracts are not risk free, they certainly lessen the types of marketing risk discussed in this analysis.

Contracts for the representative farms specify a base price, but settlement prices on each flock are not constant. Instead, final payment rates are a function of the integrator's share of production costs (chicks, feed, etc.) for a particular flock relative to other flocks produced in the same time

frame. Contracts establish a floor price below the base price (maximum discount), but no ceiling above the base (unlimited premium). In effect, an individual grower is in a competitive tournament with his peers and has a strong incentive to capture a premium above the base price by efficiently raising a maximum number of healthy birds. Integrator management seeks to lift the average and reduce the variance in the distribution of payment rates by encouraging a higher standard of production efficiency for all growers. The tournament contract is one reason for the phenomenal gains in production efficiency and ultimately lower consumer costs that have characterized the broiler industry.

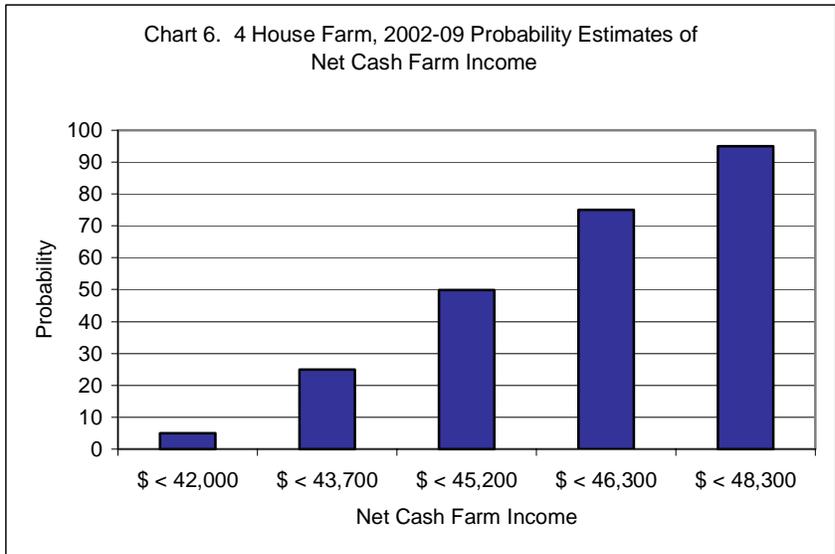


Chart 6 quantifies price and production risk for the 4-house farm. There is a 90 percent probability that average NCFI will range between \$42,000 and \$48,300. The farm needs to generate \$40,670 exclusive of off-farm salary. Therefore, the risk of a negative cash flow is extremely low.

Uncertainty

The foregoing risk analysis is possible because the probabilities of certain outcomes are known, but what about the potential occurrence of future events with no

historical precedence? At the end of the uncertainty spectrum neither the events nor the probabilities of their occurrence are known.

One source of uncertainty that is at least identifiable, but difficult to quantify, involves environmental issues on the watershed. It is well known, for example, that new federal regulations for confined animal feeding operations are to be published in early 2003. While interviews with the representative farm panels indicate that Missouri operators have already implemented many of the changes proposed in the revisions, there is no doubt that additional costs will be born by the industry. The magnitude and distribution of costs across the industry are less certain. What will the financial impact of new regulations be for existing farms? Clearly, not all operations will be impacted to the same degree. Will contracts adjust in response to new regulations? Will some farms actually benefit financially? Since the margins for these farms are rather narrow, any downward shocks to the system can quite easily result in swinging farm cash flow to the negative side. Using the six house farm as an example the

cushion between positive and negative cash flow is a mere \$8,440 at the 50 percent probability level. The implications of these issues are dealt with in more detail in companion research from FAPRI's environmental unit.

Conclusions

Broiler/beef operations typically have high debt capacity and are often highly leveraged in the first 10-15 years of operation. During this period owner-operators often need to rely on an off-farm source of income to meet cash demands. For farms with no broiler debt in the last half of this decade, our estimates indicate a cash income of about \$46,000 per year for a six-house farm and about \$29,000 for a four-house farm, both with 50 beef cows. Opportunities may exist to exceed these income levels. Quantifiable price and production risk for the whole farm is relatively low, but uncertainties abound. To fully understand the cash needs of these farms it is important to do an after-tax evaluation.

Acknowledgements

Special thanks to the following panel members for their outstanding cooperation with this project:

- 6-House Farm**
 David Brittenham
 Ron Campbell
 Cliff Fitchpatrick
 Mike Lucareillo
 Roger Schnake

- 4-House Farm**
 Murphy Biglow
 Jim Durham
 Jerry Evans
 Don Kier
 Bill Wilson

This analysis was conducted using FLIPSIM software, property of the Texas Agricultural Experiment Station.