



**Financial Impact of Proposed CAFO Regulations
on Representative Broiler Farms**

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Financial Impact of Proposed CAFO Regulations on Representative Broiler Farms

This report summarizes FAPRI's preliminary analysis of the farm level impacts of the U.S. Environmental Protection Agency's (EPA) proposed Concentrated Animal Feeding Operation (CAFO) regulations on the broiler industry. This analysis is presented primarily as an alternative method for determining farm level impacts of imposing CAFO regulations.

Representative Farm Approach

The analytical procedure used in this study is based on the representative farm concept. FAPRI has been working closely with two joint panels of broiler growers and integrator representatives since late 1998 to better understand and appropriately model the financial performance of broiler operations under specific conditions. Imbedded in these farms are real world conditions experienced by growers in southwestern Missouri, reflective of localized production and nutrient management practices, grower contract terms, loan terms, asset values, cost structures, etc. For more information on this approach consult the baseline of financial performance published in *Missouri Representative Farms Financial Projections, FAPRI-UMC Report #04-01: June 2001* at <http://www.fapri.missouri.edu>.

Table one summarizes key characteristics of the two representative broiler farms used in this analysis. In addition to representing distinct areas within the southwestern Missouri broiler production region, these farms have different size capacities and contract with different integrators.

Both of these farms are also engaged in non-broiler enterprises, essentially equal in size. For cost analysis, it is generally appropriate to apply enterprise specific costs only to the associated

enterprise, as opposed to the whole farm. However, on these farms it is expected that the beef and forage enterprises have little impact on the overall analysis of broiler specific CAFO costs, due to the relative share of the broiler enterprise.

For simulation purposes the farm begins in 1998 with a zero cash balance and a 40% debt to asset ratio. Moving forward through time, debt positions fluctuate annually depending on intervening production and economic circumstances. The poultry housing loan, a major cash cost, is setup with five years and 40% principal remaining in 1998. Thus, unless the farm experiences cashflow problems and is unable to make principal payments on schedule the housing note will expire in 2003. Other scenarios were simulated, but we believe these assumptions are a reasonable reflection of industry conditions, capturing verifiable financial performance in recent years and establishing appropriate financial positions to simulate cash flows in future years.

The representative farm approach has both strengths and weaknesses for this application. The primary strength is that these farms are a solid representation of production practices and associated financial performance as currently experienced at the farm level. Baseline data for these farms were refined and validated as recently as June of this year. However, because these farms are inherently localized it is not

Table 1. Key Characteristics of Representative Broiler Farms in 2000.

	Farm A	Farm B
Location (Missouri counties)	McDonald Newton	Barry Lawrence
Broiler houses (number)	4	6
Maximum inventory (number of birds)	84,000	137,400
Annual broiler sales (number of birds)	503,994	906,462
Litter production (tons/yr)	480	720
Acres operated (perennial forages)	200	160
Cow-calf enterprise (number of cows)	50	50
Fescue grass hay (acres)	40	65
Fescue grass seed (acres)	0	65
Market value of broiler housing/equipment	\$360,000	\$460,000
Value of total farm assets (operator owned)	\$542,000	\$722,000
Broiler receipts	\$88,703	\$169,416
Broiler receipts (as % of total farm receipts)	78	85
Broiler direct expenses (as % of farm expenses)	62	61
Broiler housing payment (as % of receipts)	24.2	16.2

appropriate to use this analysis to make sweeping conclusions about the financial performance of the industry on a vastly wider scale, with or without CAFO regulations. Similarly, this analysis is unable to address regional impacts that are likely to occur as a result of these regulations—in particular, potentially substantial costs of dealing with nutrient spreading limitations.

This approach does not incorporate any aggregate supply, demand or price impacts that might occur through time as a result of higher costs in the livestock and poultry feeding industry. Nor does it consider the impacts of CAFO regulations on grower-integrator contract arrangements.

CAFO Cost Estimates

Unlike EPA’s annualized cost approach, FAPRI sorted compliance costs into two broad categories: 1) Initial, one-time costs for new purchases and/or construction, and 2) Annually recurring costs associated with maintenance and operation. Three year recurring costs were set to an annual average. Potential CAFO costs for these farms are shown in Table 2. These numbers represent 100% of the costs, or the maximum amount as costed by EPA for farms of this size. No costs were included for nutrient reduction via feeding strategies, as these costs are born by the integrator.

Cost Item	Farm A		Farm B	
	Initial Costs \$	Annual Costs \$	Initial Costs \$	Annual Costs \$
<i>Nutrient Management</i>				
Training for litter applicators	117	39	117	39
Operator training for permitting	580		580	
Soil sampling equipment	25		25	
Triennial soil sampling & testing		133		107
Semiannual litter sampling		40		50
Semiannual litter testing		400		560
NMP development	1000	333	800	267
Record keeping		880		880
Spreader calibration		100		100
Regular inspection		130		130
Composter operation		3,600		3,600
On farm buffer, lost revenue		448		358
Off farm hauling, P based		1,959		3,247
<i>New Fixed Assets</i>				
Dead bird composter	7,333		11,000	
Litter storage under roof	65,894		98,841	
Storm water diversion	345		409	
Buffer strip establishment	746		597	
Spreader calibration equipment	500		500	
Totals costs	\$76,540	\$8,062	\$112,869	\$9,388
Cash downpayment (20%)	15,308		22,574	

FAPRI did not attempt to re-estimate the engineering costs as itemized by EPA in the *Cost Methodology Report for Swine and Poultry Sectors, EPA-821-R-01-018*. We did, however, discuss each EPA cost item with the representative farm panels. With two notable exceptions, the panels indicated that the itemized costs estimates were conservative, particularly for new construction projects.

The first exception is EPA’s lack of cost accounting for handling litter twice. With no on-farm storage litter is moved direct from the broiler house to the field. Pre-application storage as suggested by the proposed regulation then creates an additional

hauling step. Cash costs quoted for loading, hauling, and stacking litter are equivalent to \$5 per ton for short hauls (less than one mile) in 6 ton loads, or \$600 per house. This activity is contracted by the growers. Rates are reportedly the same whether clean-out is from a broiler house or from stockpile. While EPA did not include this additional cost, it was also noted that the agency apparently did not credit the farm with a return for the nutrient content of the litter. This amount varies according to the panels. The costing procedure used by EPA and FAPRI effectively makes the additional hauling costs equal to the litter credit with a net zero impact.

Secondly, the panels believe that EPA's estimates of litter production and nutrient concentration of litter for the cost models are dramatically over estimated. However, there is a problem with communication/interpretation in this regard. FAPRI was unable to duplicate EPA's quantification of these important cost variables from the available documentation. Therefore, we developed nutrient budgets based on knowledge of the farms, published manure characteristics for planning purposes and consultation with professional agricultural engineers. (Major references included MidWest Plan Service *Manure Characteristics*, MWPS-18, 2000 and the *Agricultural Waste Management Field Handbook*, USDA-NRCS, 1992). Obviously, nutrient concentration determination is a major factor in deciding the amount of additional costs to apply litter on a phosphorus basis rather than on an nitrogen basis. Missouri farms generally apply litter according to the conservative management approach of 100 lbs of nitrogen per acre.

For the FAPRI analysis, the full costs as estimated by EPA were adjusted downward to correspond with the practices of the growers—approximately equal to one-half of the full costs and so designated. See Table 3. (The full costs analysis is also shown in the results below as a benchmark for potential impact.)

	Farm A	Farm B
Initial costs (2003)	39,156	56,943
Cash downpayment	7,831	11,389
5 Year, P&I payment	8,053	11,712
Annual, recurring costs	4,014	5,379

The rationale for using the “half” costs rates comes from information provided by the panels. For example, they reported that virtually all growers currently use dead-bird composters, but a minority use stacking sheds for litter storage. However, the composting and storage facilities in place are undersized in most cases and expansion is likely to be required as part of CAFO compliance. Although some site-specific adjustments may be required, growers also indicated that buffer strips are currently in place and spreading practices use a set-back from surface and groundwater access points. Thus, no costs were included in the FAPRI analysis for buffer establishment or lost revenue. Growers are at various stages of developing nutrient management plans, thus this item was costed at 100% of EPA rates. The “half” costs rates also assume that litter is spread according to P₂O₅ removal rates, and excess litter is hauled 50 miles.

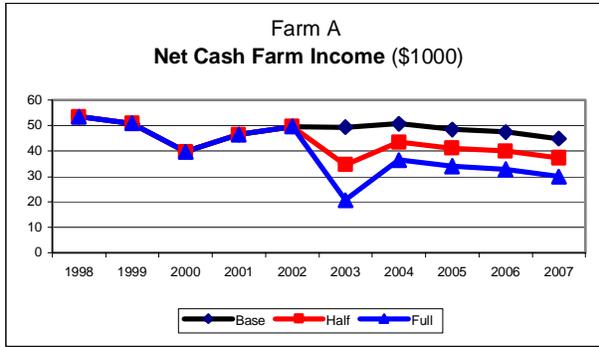
In addition to proper dollar cost accounting, we believe that consideration of cashflow timing is critical for determining the financial impact of additional cost imposition on a farm business. Unlike EPA's cost annualization approach, initial investment costs were setup on an intermediate term loan mirroring local financing conditions. Terms used were 20% downpayment at 9% interest for 5 years. CAFO costs were assumed to be imposed beginning in 2003.

Simulation Results

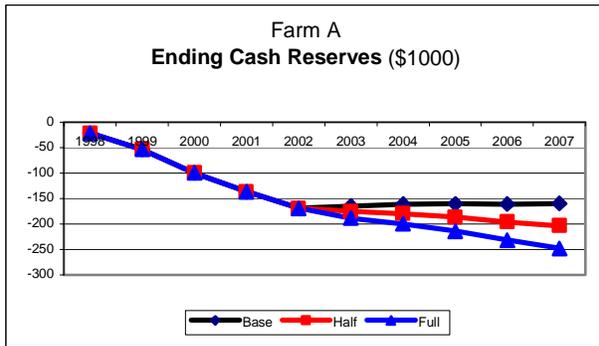
Summary results of imposing CAFO costs on the two representative farms are presented below. By way of definitions, net cash farm income (NCFI) is total cash receipts from farm product sales minus all cash farm expenses. NCFI is used to make scheduled principal payments on all loans, pay taxes, pay for scheduled machinery replacements (not depreciation) and pay modest family living expenses. Ending cash reserve (ECR) is the total cash on hand at the end of the year. It is the cash residual accumulated since 1998 after cash farm expenses, principal payments, taxes, replacements, and family living. Cash reserve, if any, is used to offset annual cash deficits. The farm's (in)ability to build cash over time is a primary indicator of financial health in this analysis.

Table 4 compares compliance costs. Costs relative to receipts are essentially equal for these two farms of different size capacities. Although the magnitude of costs is less for the smaller farm, the amount is a substantially larger share of this farm's net cash income.

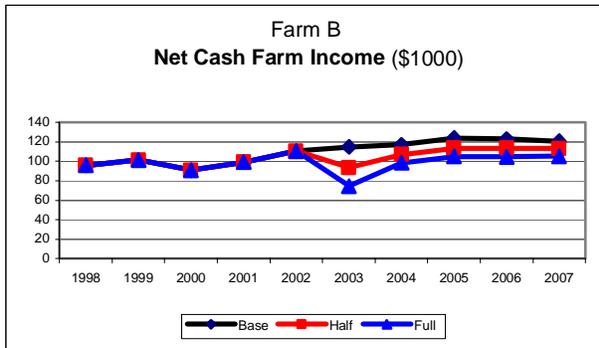
CAFO Costs Incurred First 5 Years of Compliance	Farm A	Farm B
Total CAFO costs for period	\$68,166	\$96,844
as percent of period receipts	9.0%	9.1%
as percent of period expenses	6.1%	18.4%
as percent of period net cash income	34.6%	17.9%



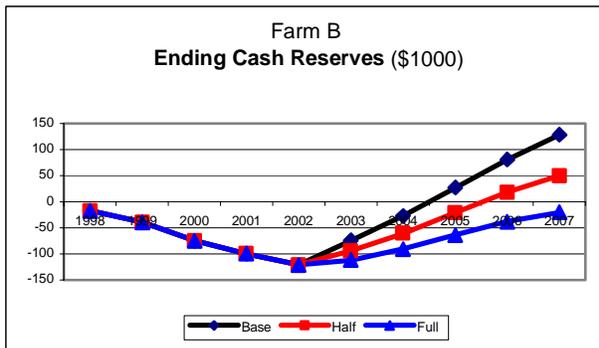
Relative to the baseline, CAFO costs (half) reduce annual NCFI by an average of \$8,870 for the period 2003-2007, or 18.5 percent. In the year of the downpayment, NCFI drops 30 percent.



Baseline cash reserves decline on this farm until the year 2002 when the poultry building loan is paid off. However, under the assumptions in this analysis this farm will not recover from its negative cash position without an external cash infusion. CAFO compliance costs only cement this projection, leaving the farm with \$43,560 of additional debt. (Assumes farm pays family living and has no other source of income).



For farm B, CAFO costs (half) decrease NCFI by an average of \$11,750 from 2003 to 2007. This is a 9.8 percent annual reduction. In the first year of implementation, net cash income declines by 18.3 percent.



In 2003, the base farm begins to pay back loans created to cover cash deficits in the previous years due to the financial burden of the housing loan. The baseline farm is generating positive cash reserves by 2005. CAFO costs (half) pull down the annual growth rate in reserves and postpone positive accumulation. By the end of the period when the CAFO loan is set to expire, the farm is building a cash cushion, but has \$79,000 less in reserve as a result of CAFO regulations.

Conclusions

- According to the representative farm panels, Missouri broiler operations will not bear the full costs of the CAFO regulations as costed by EPA. Due in part to educational efforts, cost-share availability and the implementation of Missouri environmental regulations in the last decade, many of the practices costed by EPA are currently used. As noted, all the panelists have dead-bird composting facilities and some have litter storage, but additional capacity or design features will be needed to move into compliance. This suggests that EPA may wish to consider a third category in their frequency factor approach. Rather than calculate on an either-or basis, some in-between category may also need to be examined. This category would reflect operations partially in compliance now, but requiring additional—possibly significant—upgrades to comply with the new regulations. Total industry costs may be understated as a result of not accounting for intermediate costs of compliance for specific practices.
- For some practices, it is unclear how EPA cost estimates are applied to the model farms, particularly costs related to litter output and land application of nutrients. EPA litter and nutrient production estimates potentially overstate what occurs on Missouri broiler farms by a wide margin. This may be due to an assumption that broiler houses are in continuous production. In future comments, EPA may wish to consider clarifying production levels for litter, nitrogen, and phosphorus and land area spreading requirements.
- While gross income is relatively stable for contract broiler farms, margins are tight and contracts tend to be inflexible for several successive years. The results of this analysis, which include a family living withdrawal, indicate that Farm A does not survive on its own even without CAFO costs imposed. Farms of this size (4 broiler houses) rely on off-farm income to support family living and debt retirement in the early phases of the broiler enterprise. The larger, more financially efficient Farm B survives and is able to build wealth post CAFO compliance.
- While cost annualization is helpful, evaluation of capital investments should include cash flow impacts. This is a standard practice of firm financial management and the credit industry. Cost annualization alone can yield a different decision than one that incorporates cash flow analysis.
- This approach examines broiler farms as they are currently operated and does not segregate the broiler enterprise from the remainder of the farm business by allocating costs to individual enterprises. While the whole farm approach has merit, it is also prone to confounded results because enterprise specific costs are spread over a larger share of the business. That is, whole farm analysis inherently assumes that non-broiler enterprises, such as beef cattle, bear a portion of the broiler CAFO costs. Principles of economic analysis and farm financial management suggest that any measure of industry costs and returns should not be masked by exogenous factors that may or may not be a part of the total business.
- This analysis is presented primarily as an alternative method for determining farm level impacts of imposing CAFO regulations, not as a projection of the impacts of the proposed rule on the broiler industry. The conclusions drawn here are based on only two panels with specific types of broiler operations. While every effort is made to make these farms “representative” of broiler production in these local areas, generalizing the conclusions should be done very carefully.

Comments Submitted by:



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