SS-AAEA Journal

1999-2000

Student Section of The American Agricultural Economics Association

1st Place

DEVELOPMENT OF THE INTERACTIVE BROILER INCOME SPREADSHEET

Tara Shofner
Department of Agricultural Economics and Agribusiness
University of Arkansas
Fayetteville, AR

Prepared for Undergraduate Student Paper Presentations
AAEA Annual Meeting in Tampa, FL

Abstract

The poultry industry has experienced unprecedented efficiencies since 1960 in large part due to vertical integration facilitated by production contracts between growers and integrators. As growers seek information about contract production they need to be well informed about all aspects of the process, especially potential income. Recent poultry grower complaints have surfaced as a result of incorrect expense and revenue expectations.

The Interactive Broiler Income Spreadsheet (IBIS) is developed to enable current and prospective poultry producers to better estimate income. IBIS, an unbiased Excel spreadsheet tool to assist in decision-making regarding broiler production profitability, uses actual grower expense and revenue information or, alternatively, grower-panel default data to assess income under various grower-specified production, expense and price scenarios.

Poultry integrator grower service personnel, lenders and Cooperative Extension professionals will utilize IBIS to assist growers in operational planning and risk tolerance identification in varying economic situations. Growers may also gauge effects of capital improvements, equipment upgrades, chick placements and time between flocks on income.

Introduction

The structure of the poultry industry has changed considerably over the past several decades. The industry has evolved from chickens roaming in the backyard to highly specialized operations that produce a total of 900 billion birds a year for meat. The poultry industry has experienced unprecedented success in production and marketing efficiencies. One of the reasons this success has been a direct result of the use of contracts between the grower and the integrator. Contracts have worked very well for a number of years; however, recently there have been many complaints from the poultry growers. Part of the problem is a result of poultry growers' incorrect expectations about projected expenses and revenues. These erroneous expectations are a product of poor information that they received prior to signing their initial contract. There is no publicly available data to examine grower returns; therefore, it is nearly impossible to determine the overall financial situation of poultry growers (Rogers, 1992). For the most part potential growers are left to their own devices when evaluation the feasibility of new poultry farms.

As potential growers seek information about contract production they need to be well informed about all aspects of the process, especially the potential income. Investing in a poultry farm is very capital-intensive. The estimated investment for a fully equipped poultry farm in 1996 was $100,800 for a 42'x 500' house, with most farms having at least 2 houses (Vukina, 1998). Even though poultry farmers invest 50% of the capital required for producing the final products for the industry, over 71% of contract growers earn a net income below the poverty level from they poultry operations (Krebs, 1999). A major risk that the grower face is the capital cost of the land, and the degree of the asset fixity for the buildings and equipment, since they have no good alternative use (Rogers, 1992).

Many integrators give the grower only oral information about the profits that they will receive under the contract. This may be because the integrator does not have correct information to give a potential grower. One major problem is that many of the contracts do not generate the initial profits described by the integrator. Even if profits are in line with projections the first year, they often decline after the second year making it necessary for the farmer to seek other income opportunities. According to a 1999 survey

of Arkansas poultry growers conducted by the University of Arkansas on behalf of the Arkansas Farm Bureau Association, growers were asked to rank their satisfaction with various aspects of the poultry business. Many acknowledged discontentment with the financial returns in their poultry operations. For example, 56% of growers expressed some degree of dissatisfaction with the income that they receive from their poultry operations. 67% stated that they are not getting a fair return on their investment. Many also contended that they are unhappy about the communication between themselves and their integrator. When asked, "My company should provide educational programs to help producers better estimate income and expenses" 84% of growers agreed. In response to the question "Communication between growers and companies is adequate," 53% of respondents disagreed. In the free response section, one grower stated, "There is not enough information for potential growers."

As it becomes apparent that income from the poultry operations is not sufficient, many producers are finding it necessary to have off-farm income just to make ends meet. Over 47% of respondents of the AFBA survey revealed that their spouse had either part-time or full-time off-farm employment. There simply may not be adequate net income from the poultry operations only to support a household. This is particularly the case if substantial debt service on the operation exists.

Problem Statement

There are several reasons why profitability from broiler operations is so difficult to forecast. First, it is still nearly impossible to effectively determine revenue for poultry growers because the method used to determine bonus payments are based on average cost production. The bonus pool takes all the producers who sell in the week, and averages their cost of production. If the grower falls above that average they receive a bonus amount proportional to their ranking. If they are below the average they are penalized, and receive no bonus. Therefore, the actual amount that the grower receives in base pay and bonuses depends on performance of other growers that sell in the same week. The payment amount doesn't

actually reflect the growers performance compared to an average grower, but of the other growers who sell the same week he or she sells.

Secondly, estimating income may be difficult because of varying poultry houses sizes. While most new poultry houses are built on a standard house size, many older houses were not built to any standard sizes. Variable dimensions of older houses can also lead to difficulty in estimating profitability. Many potential growers are faced with trying to estimate revenues and expenses from a standard estimate sheet provided by the integrators.

Finally, many potential sellers are not usually willing to supply all of their past records to be evaluated before the sale of their farm. Potential growers may find it very difficult to get an accurate approximation of the farms' past performance. And, as alluded to preciously, integrators do not have accurate records for growers due to the lack of communication and because they view the growers as independent contractors for grower services.

Objectives

The overall objective of this project is to help prospective and current poultry producers to better estimate profits by developing the Interactive Broiler Income Spreadsheet (IBIS). IBIS is an unbiased tool using Excel software that will be made available to existing and prospective growers to use as they make decisions regarding the current and potential profitability of raising chickens. Specifically, it will:

1. Allow grower to more precisely estimate revenues and expenses;
2. Allow growers to calculate the feasibility of new investments;
3. Allow growers to easily change any of the factors that will influence revenues and expenses to reflect current weather, price, interest, or regulatory conditions.

Data and Methods

Budgets play an important role in planning for any new investment. The two types for budgets that are of particular interest to poultry farmers are capital investment budgets and enterprise budgets.

Budgets aid in the systematic evaluation of alternative plans by putting the plans "on paper" to determine which will maximize profits. They can be helpful in planning, implementation and control of any farm business.

Major capital purchases should be carefully analyzed and planned to make certain that they fit into the long-term operation of the business. Given the large amount of capital that poultry farms must borrow, capital budgeting is one of the most important financial management tools available to producers (Beirlein 1995). For many poultry producers the capital budgeting does not end after the initial investment of houses and equipment, but continues with the investment in company-required upgrades. As new technology is introduced, many poultry operations are obligated by their contracts to upgrade or replace existing equipment.

Another type of budget is the enterprise budgets for poultry. Enterprise budgets organize projected income, expenses, and profit of a single enterprise. These budgets may be published by the Cooperative Extension Service or the poultry companies such as Tyson's, Perdue, or Gold Kist. Enterprise budgets are very general and are a good starting place for prospective growers to begin their research into poultry farming. However, they may to use assumptions that can skew projections of profitability. Most of these budgets do not break down the costs into enough detail. Growers are also concerned about the hidden expenses that are not explicitly described on these enterprise budgets or by the integrator. Each poultry operation is unique, and many of these budgets do not reflect different factors such as assorted house sizes, litter as an expense or revenue. They may also disregard the extreme discrepancy between utility expenses due to variable natural gas, propane and electricity rates and the use of wells versus municipally-treated water.

The first step in this project was to develop a data collection sheet. The information collected from this sheet was used as the default information. It was important to have default data especially for potential growers who have no records of their own. This collection sheet also was used as a foundation for the spreadsheet. The data collection sheet gathered information about all areas of production expenses

and revenues for each of four years. The data collection sheet was modified several times, as it became apparent that important information was excluded. One of the most important steps of this project was to accurately reflect all of the expenses that are incurred by poultry growers. Many of the expenses were broken down into usage amount and price per unit instead of simply total cost to be more precise.

After the data collection sheet was developed, growers' participation was needed. The data collection sheets collected information from contract growers from four largest poultry integrators in Northwest Arkansas. Those companies are George's, Peterson's Farms, Simmon's Industries, and Tyson Foods. The companies approved the participation of at least four contract grower from their companies. These growers where selected based on their past performance and record-keeping practices. All information collected was confidential and no names of the growers or integrators were requested on the data that was collected.

Data was collected though personal contact. Each of the four growers selected by the poultry companies were mailed a data collection sheet with a cover letter explaining the purpose of the research. Each letter was followed up by a telephone call to answer questions. In addition, farm visits were made utilizing the same data collection sheets as previously mailed. This additional step proved to be most successful. Many of the growers were not easily reached by phone and felt too busy to sit down and answer numerous questions about their farm; however, all the growers were more than happy to answer questions during the visit. To date, information from eight growers has been obtained, verified, and analyzed, and four others have agreed to personal visits. In addition, all growers' information will be averaged before this panel data will be used as default values for the various cost and income components of IBIS.

Interactive Broiler Income Spreadsheet Development

IBIS is developed using Excel software. A sample of ISIS is located on pages 11-14. The sample data used was from one of the farms included in the data collection phase. The sensitivity of the program can not be adequately observed in the sample; however, the sample does provide a look at the inputs and

outputs of the formulas. IBIS is divided into two parts: assumptions and budget analysis. The assumption section is divided into house dimensions, estimated income, estimated expenses, and loan information. The budget analysis section takes the information from the assumptions and computes profits.

The assumption section begins with the House Dimensions segment that totals the number of houses, and computes the total square footage of the poultry houses. Since most houses are built in a few standard sizes, the sizes 40x400, 40x200, 32x400, and 42x500 are formatted so that the user only has to enter the number of each of those size houses they operate. However, there are many poultry houses that do not fit into one of these four typical sizes. IBIS is designed so users may enter up to three unique house sizes along with the number of houses of that particular size. The total square footage is used in the default formulas, as well as, to figure the net cash returns on a square foot basis. This allows users to compare returns on different size operations.

Next in the assumption section, users are asked to fill in cells with their information or utilizing the provided default numbers. After the user completes the House Dimensions section many of the default values automatically adjust based on the number of houses and total square footage of their operation. Many of the default values have formulas that allow for a more accurate value based on either number of houses, number of chicks, or total square footage. Many current growers, however, will have their own records that more precisely reflect their operation.

The income section separates all areas of possible income-generating activities. Many poultry producers have other enterprises that supply income. For example, some the farmers that participated in the data collection had cattle, sheep, goats, and/or hay operations. IBIS, however, only includes the income that is directly derived from poultry operations. Default information is provided for almost every category except the gas and utility allowances and the average bonus amounts. These three items vary tremendously by company, geographic location, and individual grower preferences. Use of any default

amount could be very misleading; therefore, the individual integrator or producer can better estimate these values.

The expense section is divided into variable and fixed expenses. Usage amount and price per unit divide many of the variable expenses. The fixed expenses include taxes, insurance, depreciation, opportunity costs. Many of the fixed expenses do not have default values because they are things such as initial investment amount on houses and equipment, interest rates on loans, and opportunity cost of land ownership. These values will vary by user. Below the expense section is the Loan Information section. The section asks for basis loan information that will be used in the budget analysis below. There are three areas for loan information: house loans, equipment loans, and upgrade loans. Many users may not utilize all three areas. Some may have a combined house and equipment loan. Also current producers may only need to compute the payments on an upgrade if that is what they are considering.

Also included to the right of the assumption section are question and answer prompts. These help clarify the particular information being asked for and help to answer question that may arise from various growers in actual farm situations. In the IBIS example that is attached, only a select number of prompts are shown. For instance, several of the questions address the different uses of litter. Litter is included in both the revenue and expense sections. This is because litter can be of value to a grower if they spread it on their own farm or sell it to another farmer to spread. If a grower spreads the litter on their own farm it is a credit, and if they sell it is cash revenue. However, litter can also be an expense if the grower must pay someone to clean out the houses and dispose of the litter. This would be the case if the grower either did not have the land area or the desire to spread the litter. It can also be a combination of both revenue and an expense. Other prompt questions include things such as company utility allowances, dead bird disposal cost, and what to enter depending on whether wells or ponds supply water for the farm.

The Budget Analysis section uses the information gathered in the Assumptions section and computes Total Operating Revenue, Total Operating Expenses, Net Cash Returns, and Net Cash Returns Per Square

Foot. The budget analysis includes both budget value and cash value. The net cash income is computed by talking the revenue information that is entered into the cells, and converting it into a pay formula of:

Chicks per flock* Flocks per year* (100-Percent mortality)/100* Average pounds per finished bird* cents per pound (contract base)/100

The other poultry related, income-generating activities then add to the pay formula to get the total operating revenue. Those include litter revenue, gas allowances, utility allowances, and performance bonuses. Total operating expenses are then subtracted from total operating revenues to get net cash returns. Net cash returns per square foot is simply net cash returns divided by the total square footage computed in the assumption section.

There has been continual verification of the effectiveness and accuracy of the IBIS software. Poultry integrators in the Northwest Arkansas area were consulted about the feasibility of this project. They where very instrumental in collecting data for IBIS. Current poultry producers gave advise on the areas of revenues and expenses that should be incorporated, including many hidden expenses that where not on any of the published budgets. With the completion of the IBIS program, verification will continue to take place. A panel consisting of four lenders is being asked to compare its results with their records to see if projections are in line with what they see from their customers. Also trial runs are being conducted through poultry companies as they consult with current and prospective growers before IBIS is released to the public. Continued monitoring of IBIS as the poultry industry changes will be necessary to keep the program up-to-date and functional.

Application of Results

Several groups will use IBIS, and demonstrate its effectiveness to growers. IBIS will be available to producers though the poultry integrators, area lenders, the Cooperative Extension offices, and the University of Arkansas Home page.

IBIS will be primary used by the poultry integrators in Arkansas. These poultry companies have been very cooperative in its development. IBIS can be used in two ways. First, it will be used as a decision

tool for potential growers. In the past they may have given some growers misleading information largely because they themselves did not have accurate information. IBIS will serve a starting point for these new growers. By having this interactive software, they will be able to play "what if" games while the grower observes. Such "what if" games can help growers identify their risk tolerance to varying income and expense levels. The program can also be handed out on disks to the potential grower if they want to compare numbers with current producers. Secondly, IBIS can be a very effective training tool uses by service personnel for current growers. IBIS is incredibly useful because of the sensitivity of the formulas to small changes in the input data. This is terrible important to the poultry producer whose income is based on such a small margin. For example, changing the flocks per year from 5.5 to 6 can increase income by thousands of dollars a year. Many of these inputs act in the same way. Field supervisors can quickly demonstrate to grower the income effects that management decisions have. In addition, growers have the capacity to gauge the effects of capital improvements/equipment upgrades and chicken placement per year.

IBIS will also be made available to area lenders to use with poultry growers as a planning-aid and for assistance in financing matters. Many lenders have little information of the profitability of poultry farms, and are not in a position to advise on the cost-effectiveness of a poultry grow-out operation.

Another way that this program will be utilized is though Cooperative Extension personnel. This decision-aid program will be made available to all Arkansas Extension County offices. Extension staff will be better prepared to answer questions that current and prospective producers have about the earnings of a poultry operation. In addition, the IBIS program will also be available on the University of Arkansas home page.

As useful as IBIS can be, it does have its limitations. Even the best farm management programs are of no use if producers do not have the skills, technology, or desire to use them. In the AFBA survey, while 60% of respondents used a computer in their farm operation, only 36% of those with a computer used a spreadsheet program. Many farmers do not see the need to implement computer technology in

their daily operations even those who do use computers often do not have the knowledge to use that technology to their full advantage. It is also important to remember that even the best budget planning cannot take the place of good management. IBIS is simply a tool to help management more effective.

IBIS can be a very useful resource for current and existing poultry producers. With the large capital investment that is required for a poultry operation, more precise information is need for evaluating profitability. Almost 45% of growers surveyed by the AFBF survey feel that there is not adequate problem-solving information available to them. For the poultry industry to continue to enjoy the successes they have in the past, growers must be confident in the information that is provided to them.

References

Arkansas Farm Bureau Association Poultry Industry Grower Survey. December, 1999. Conducted by the University of Arkansas.

Banker, D., R. Green, and J. Perry. 1997. "Broiler Farms' Organization, Management, and Performance." Economic Research Service/USDA

Beierlein, J., K. Schneeberger., and D. Osburn. *Agribusiness Management*, 2nd. ed. Waveland Press Inc., 1995.

Cunningham, D., "Contract Broiler Production: Questions and Answers." Georgia Cooperative Extension Service. Leaflet 423. 1995.

Doye, D., J. Berry, P. Green, and P. Norris. 1996. "Broiler Production: Considerations of Potential Growers." Oklahoma State University. Division of Agricultural Services and Natural Resources. OSU Extension Facts F-202

Goodwin, H.L., and A. Rodriguez. "Broiler Production Contracts." Unpublished paper, University of Arkansas, 1998

Johnson, Jim and others. 1996. Farmer's Use of Marketing and Production Contracts. Farm Business. Economics branch, Rural Economy Division, Economic Research Service, U.S. Department of Agriculture. Agriculture Economic Report No. 747.

Kay, R., and W. Edwards. *Farm Management,* 4th. ed. Boston: WCB McGraw-Hill., 1999.

National Contract Poultry Growers Association web site. Various Articles. http://www.web-span.com/pga

Krebs, A.V. 1999. "ConAgra: Increasing Stockholders Wealth at Family Farm Expense." *The Agribusiness Examiner*

Rogers, R., "BROILERS: Differentiating a Commodity." 1990. Department of Resource Economics, University of Massachusetts-Amherst.

Rural Advancement Foundation International-USA web site. Various Articles. http://www.rafiusa.org.