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Developing a Comprehensive System

David Bache

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INTRODUCTION

This is one of six publications to help you decide what information is needed for efficient management of your hog enterprise and then to help you develop a system of data gathering and analysis.

This publication begins with a general discussion of the changing needs for information and then gets into the specifics of designing a system. The first objective is to help put your particular business in perspective as you consider your need for records. The second objective is to present a sequence of steps to follow in developing a swine records system for your farm. The final objective is to show the flow of data and information between sections of a comprehensive system.

Each of the next five publications is devoted to a particular area of record keeping concern, beginning with a discussion of the importance of the area. When feasible, an estimate is made of the cost of making specific measurements and of their potential value. A variety of other information is provided: calculation, recording forms and reports with sample data to illustrate their use.

Available separately is a packet of blank recording and report forms (EC-602) for producers to copy or to modify to fit their needs.

Historical Perspective

Where Have We Been? Until recently, record keeping was not a matter of great interest to hog producers. The small size of the typical unit and the fact that hog production has usually been a secondary enterprise explains the lack of interest. For instance, as recently as January 1, 1965, 1,057,570 hog farms were reported in the United States and the average inventory per farm was 48 head. With production units as small as this, the record keeping needs were modest and there was little economic incentive to develop systems to monitor performance.

Because most hogs were produced in small units on general farms, individual operators adopted performance standards that were easy to measure. "Pigs weaned per litter" was the accepted standard for sow herd productivity. No trouble counting the pigs at weaning time and dividing by the number of sows from which they were being separated. "Age to Market" was the accepted measure of slaughter hog performance. With farrowing occurring only twice per year on most farms, there was no problem distinguishing between pigs from different farrowings. And there was no problem calculating the elapsed time between the

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Contents

Page

Introduction........................................ 1
Historical Perspective.......................... 1
Where Have We Been?
Where Are We?
Where Are We Going?
What Changes Should You
Consider?......................................... 3
Producer Testimonials
Reasons for Current Interest
The Use of Micro Computers

What Kinds of Records Do You
Need?............................................. 6
Tax and Financial Management
Records........................................... 6
Cost-of-Production Records................... 8
Records for Breeding Stock
Selection and Culling.......................... 11
Records for Inventory Control,
Communication and Scheduling............. 11
Records to Measure Production
and Productivity and to Monitor
Herd Health...................................... 12

Developing Your Hog Record System...... 12
Producer Questionnaires...................... 12
Tables and Exhibits............................ 13
Recording Forms and Reports............... 13
Calculational Definitions.................... 13
Exhibit I-1.................................... 13
Exhibit I-2.................................... 14

The Mechanics of Record Keeping........ 14
Gathering the Data............................. 14
Data Processing................................ 17
Report Writing and Summary............... 18
Data Storage................................... 19

Table I-1. 1982 Iowa Swine Record
Summary......................................... 7
Exhibit I-1. Setting Priorities
for Your Record System...................... 9
Exhibit I-2. A Comprehensive
Record System for Hog Producers....... 10
Exhibit I-3. Daily Data Gathering
Sheet to be Used with a Clipboard... 15

Exhibit I-4. Two-Page Spread from
a Shirt-Pocket Book for Data
Gathering...................................... 16
Exhibit I-5. Criteria for Choosing
Data Processing Services.................. 18

Record Keeping for Hog Producers

The development of this series of
publications was made possible by spe-
cial project funding from the United
States Department of Agriculture--Exten-
sion Service. The ideas presented here
have been developed through close coop-
eration among the national extension
service, the state universities, and the
pork production industry. Errors and
oversights are the responsibility of the
primary authors.

This publication is one of six in a
series, each designed to be a self-
contained unit. Yet the relationship
between this and the other five publica-
tions is of critical importance. Each
publication (section) in the series is
identified by a Roman numeral for pur-
poses of reference back and forth among
the six subject areas. Tables, exhib-
its, recording forms, and reports also
are identified with a combination of
Roman and Arabic numerals. For
instance, Table VI-1, Performance Mea-
sure for the Swine Herd, is the first
table in EC-601 (section VI): it is
found in that publication although it
may be referred to in others. EC-602
consists of blank recording and report
forms for your own operation.
birthdate of the first litter and the date of the first sale from that farrowing. The length of this interval was accepted as an indicator of feed efficiency on the assumption that feed efficiency and rate of growth were closely correlated.

Until recently, hog producers whose only product was hogs were practically nonexistent. Hogs have generally been produced in combination with grain and often with some other livestock enterprise. With this situation, it was very difficult to identify hog production costs as distinct from costs in the competing enterprises.

Where Are We? There were 483,690 hog producing farms reported in the United States on December 1, 1982; the average inventory per farm was 110 head. Seventy-six percent of these hog farmers had fewer than 100 hogs in inventory but these small units had only 13% of the nation's hogs. Enterprises with over 500 head in inventory accounted for 5% of the operations and 48% of the inventory. And medium-sized enterprises--100 to 500 head in inventory--accounted for 19% of the operations and 39% of the inventory.

Where Are We Going? The number of hog farms in the United States has been decreasing about 3% per year over the past 15 years with little change in the number of hogs produced. The result has been a rapid increase in the size of the average unit. Survey data show the average increase in output from large hog farms (units selling over 2,500 head annually) to be about 15% per year. This means that the average of such units doubles output each five years. The chances are very good that this trend will continue.

It is clear that there is a dynamic, growing segment of the pork producing industry composed of a relatively small number of production units producing a rapidly growing share of the nation's hogs. This segment is made up of large, capital-intensive, specialized hog farms with record keeping needs and capabilities that are completely different from those of traditional producers. If you decide to continue as a hog producer, the volume produced on your farm is likely to increase. And the need for records will increase with volume.

What Changes Should You Consider?

As production units continue to increase in size and specialization, as production calendars are more tightly scheduled, as the number of people involved in the operation of each unit increases, there will be a growing need for records: Records for the Internal Revenue Service, Records for lenders and absentee owners, Records for consultants, Records for on-farm management, Records for evaluation and motivation of employees. The record-keeping and report-generating task can become unwieldy. Your challenge is to make certain your record-keeping activities will be profitable rather than merely tedious and time-consuming.

Producer Testimonials. First, consider your goal for the size and nature of your hog enterprise. There is no need to adopt recording procedures designed for a big, intensive, multi-man, seed stock unit if yours will have none of those characteristics.

All of us are subject to the federal income tax, so there is no choice in keeping enough records for that calculation. Many, but not all, hog producers will be required by their lenders to have adequate records for preparing

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3 Rhodes, Stemme and Grimes, Large and Medium Volume Hog Producers: A National Survey, SR-223, University of Missouri-Columbia, Ag. Experiment Station.
net worth statements and cash flow projections. Beyond that, the record needs of each producer are unique. Following are testimonials by four farrow-to-finish producers, each with a different but carefully considered idea of the records he should keep. Can you relate to these and learn something from them about where to place the emphasis on your farm?

--From a successful established farmer who runs a 30-sow unit: "I have no need for anything but tax records. I don't borrow money so no one asks me for a Net Worth Statement or a Cash Flow Projection. I do the hog work myself and have plenty of facilities. I don't need sow records because I can remember every sow and her performance."

--From a young 60-sow owner-operator who buys all his breeding stock: "I do borrow so I need to generate a Net Worth Statement and a Cash Flow Projection in addition to my income tax report. Scheduling is no problem; I farrow continuously and control the use of facilities at the breeding barn. I don't need cost-of-production data: if I buy right and produce a good product, what more can I do? I do record and calculate and prepare an annual report of pigs weaned/sow/year, rate-of-gain in finishing, and yield-grade of my market hogs."

--From the owner-operator of a large farm on which there is a 400-sow unit operated with hired labor: "I calculate my own taxes and prepare an annual net-worth statement. And, after two bad years with cattle and hogs, the banker is hinting that he'll need Cash Flow Projections. I have had a lot of trouble with incompetent, irresponsible labor, but I now have the secret to success in raising hogs. What it takes is a system that insures that every animal is observed three times a day by a competent, interested person and that action is taken on his observations. I have developed a system for observing and recording problems, and for the development and continuous updating of a work schedule."

--From the manager of a 600-sow corporate-owned unit: "I deliver receipts and expenses and a quarterly inventory to our accountant who prepares tax and net worth statements. We have not prepared Cash Flow Projections and have suffered financially as a consequence. My success depends completely on this hog unit so cost-of-production records are of critical importance. We calculate production costs quarterly and are members of a record association so we get a comparison with the performance of other producers. We record and chart market prices and some key performance measures. For instance, we have a monthly chart of conception rates which helps in deciding the number of sows to breed to keep facilities full. Daily we record sows bred, sows farrowed, and pigs born. Greatest emphasis is on Sows Bred; we must breed 34 per week to keep our factory full. On a weekly basis, we record sows weaned and pigs weaned; we use this data for an incentive payment to the labor force. A card for recording events in the current pregnancy follows each sow through gestation and lactation; pertinent data are transferred from this to a life-history card on each sow. The life-history record is used for culling (they are given a second chance) and for choosing the mothers of replacement gilts."

Reasons for Current Interest. You can gain perspective by considering some of the reasons for the current interest in hog records. What are some of these reasons? How do they apply to your business?

--The emergence of large, specialized production units. Because all the eggs are in one big basket, such units involve greater risk than traditional diversified farms. Records are an
important tool to control the risk of disease, poor performance, and high costs. In addition, such units are often run by hired labor. As a substitute for the eye of the master, ownership needs reports to monitor performance.

--Large losses during a two and a half year period in 1979, 1980, and 1981. Not since the early 1960's has there been so long a period of sustained losses for hog producers. Many producers and their creditors were badly frightened. Both groups look to records as a tool to help avoid a repeat of a bad experience.

--The development of production technology that makes it possible to gather more and better data. For example: 1) Hand mating makes it possible to identify the sire and monitor his performance; 2) Individual sow identification makes it possible to develop life history records on females; 3) Convenient scales make it possible to calculate Average daily gain in various stages.

--The development of technology that makes it easier to process data. Computers provide for convenient storage of data. But, more important, they can make it very easy to sort data that are stored and to retrieve them in the form of meaningful reports. Because of the importance currently placed on questions about the adoption of microcomputers, a short discussion of their use follows.

The Use of Microcomputers. The service of main-frame computers has been available to many hog farmers since the mid-1960's. Use of these services has grown gradually. However, interest in electronic data processing came to a boil in the early 1980's with the development of relatively low-cost, personal, on-farm, microcomputers.

There are good reasons for caution in deciding to buy a personal microcomputer. The current atmosphere is not conducive to good decisions. A great variety of hardware and software packages are being aggressively merchandised and they are difficult to evaluate. Producers are being pressured from all sides to buy computers. The message is that, unless you do so, you are at least hopelessly old-fashioned and probably a bad parent. Another problem is that microcomputers have had very limited use by hog producers. There is almost no track record of their use and usefulness in your business. Producers have not yet decided what can and should be measured on their farms, and they do not know what to expect of personal computers. The developers of software (the computer programmers) are confused because the producers are confused.

Are you interested in a personal computer? Should you be? Producer experience will be cited to provide perspective in considering these questions. In November 1982, a panel of four hog farmers described their use of personal computers to the audience at the Purdue MicroComputer Workshop at Lafayette, Ind. It quickly became obvious that these four microcomputer enthusiasts shared some common characteristics and experiences. Because we think you can learn by considering these, they are described here:

--Big units. All four were managers of large farrow-to-finish units, ranging in size from a 150-sow purebred herd to a 700-sow commercial herd.

--High investment technology. All had made large investments in facilities for confinement production. Consequently, they were concerned about adhering to a tight production schedule and expected the microcomputer to help with that.

--Hired labor. The labor force on these farms ranged from three to seven men. The managers looked to microcomputers
to help monitor performance and to make calculations on which they could base incentive payments.

--Home produced breeding stock. One of the four is a purebred producer who maintains two breeds. The others are commercial producers. Two of these had maintained closed herds; the third was producing the female line internally for a terminal cross to produce slaughter hogs. The point is that all were doing something unusual in regard to breeding stock production. Therefore, they had more need than the traditional commercial producer for records to guide culling and selection.

--Computer experience. Each of the four had considerable experience with computers before buying a micro. Each had subscribed to a computerized record keeping service. All had participated in workshops where main-frame computers were used as decision aids.

--Data base. All had a data base of hog enterprise information before buying a personal computer. The purebred producer had 20 years of performance and pedigree data that he wanted to summarize. One commercial producer had gathered data on mortality rates and causes of death in the various production stages. Another was routinely weighing animals at birth, weaning, feeder-pig size, and slaughter market size. This producer had been calculating rate-of-gain and feed conversion in various stages. The point is that all four had definite ideas of the performance measures that were important. They had developed procedures to gather data. They had data to summarize.

As a summary to this short discussion of microcomputers, consider the following suggestion for the best sequence to follow in adopting this technology. First, identify the needs on your farm for data storage, calculations, reports. Then, look for a source of software that will perform the functions you desire. Finally, select hardware that meets your standards for convenience, capacity, speed, and quality.

WHAT KINDS OF RECORDS DO YOU NEED?

To begin, we want to reemphasize two themes: 1) your needs are unique; 2) record keeping costs money and no records should be kept that don't promise to return more than they cost. In considering your record needs, it helps to divide those into areas of concern. Toward that end, these publications are divided into sections. Each section deals with a specific area of need. The following paragraphs represent a summary statement for each section. Use these summary statements to decide which sections have greatest interest for you.

Tax and Financial Management Records
(EC-597)

Farmers in general are not record-keeping enthusiasts. The typical producer has kept little more than the records he is required to keep. And the principal "demanders" of information have been the Internal Revenue Service and the lenders. The evidence suggests the typical hog producer does not provide very good information even to these two groups, and he has suffered as a consequence. The penalties are overpayment of taxes and poor financial decisions.

The IRS has granted a special exemption to farmers; they are permitted to report on a cash basis. Lenders have accepted net worth statements that are casually prepared—often at the lender's desk as a loan application is completed. Consequently, many farmers do not take inventories, do not have the accuracy checks provided by formal accounting, make no attempt to reconcile net worth change and earnings. EC-597 (Section II) identifies these and other problems and offers suggestions for improvement.

This area of record keeping concern is different from the others a hog
## Table I-1. 1982 Iowa State University Swine Enterprise Record Summary*
### Farrow to Finish Operations

<table>
<thead>
<tr>
<th>SORTED ON THE BASIS OF ITEM # 16</th>
<th>HIGH</th>
<th>LOW</th>
<th>AVERAGE OF 147 FARMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>(MARGIN PER CWT. OF PORK PRODUCED)</td>
<td>49 FARMS</td>
<td>49 FARMS</td>
<td>147 FARMS</td>
</tr>
<tr>
<td>1. Net Profit and Return to Management, $</td>
<td>75230.32</td>
<td>17506.80</td>
<td>44968.10</td>
</tr>
<tr>
<td>2. Return Per $100 of Feed Fed, $</td>
<td>249.04</td>
<td>203.44</td>
<td>226.96</td>
</tr>
<tr>
<td>3. Hourly Return to Labor and Management, $</td>
<td>55.70</td>
<td>18.19</td>
<td>37.84</td>
</tr>
<tr>
<td>4. Annual Percent Return on Capital, %</td>
<td>70.81</td>
<td>24.73</td>
<td>47.02</td>
</tr>
<tr>
<td>5. Average price Per Feeder Pig Sold, $</td>
<td>52.06</td>
<td>60.69</td>
<td>53.91</td>
</tr>
<tr>
<td>6. Average Price Per Cwt. of Market Hogs Sold, $</td>
<td>54.91</td>
<td>54.46</td>
<td>54.65</td>
</tr>
<tr>
<td>7. Average Price Per Cwt. of Breeding Stock Sold, $</td>
<td>48.10</td>
<td>46.60</td>
<td>47.84</td>
</tr>
<tr>
<td>8. Average Price Per Cwt. of All Hogs Sold, $</td>
<td>54.64</td>
<td>53.98</td>
<td>54.29</td>
</tr>
<tr>
<td>9. Feed Cost Per Cwt. of Pork Produced, $</td>
<td>24.87</td>
<td>28.70</td>
<td>26.72</td>
</tr>
<tr>
<td>10. Other Operating Costs Per Cwt. of Pork Produced, $</td>
<td>4.66</td>
<td>7.20</td>
<td>5.81</td>
</tr>
<tr>
<td>11. Depreciation, Taxes &amp; Ins. Costs Per Cwt. of Pork $</td>
<td>3.51</td>
<td>5.54</td>
<td>4.41</td>
</tr>
<tr>
<td>12. Capital Charge Per Cwt. of Pork Produced, $</td>
<td>5.09</td>
<td>7.29</td>
<td>6.20</td>
</tr>
<tr>
<td>13. Operator &amp; Family Labor Cost Per Cwt. of Pork, $</td>
<td>3.23</td>
<td>3.87</td>
<td>3.70</td>
</tr>
<tr>
<td>14. Total Cost Per Cwt. of Pork Produced, $</td>
<td>41.39</td>
<td>52.60</td>
<td>46.82</td>
</tr>
<tr>
<td>15. Margin Over All Costs Per Cwt. of Pork Produced, Not Including Inventory, $</td>
<td>13.25</td>
<td>1.37</td>
<td>7.47</td>
</tr>
<tr>
<td>16. Margin Over All Costs Per Cwt. of Pork Produced, Inventory Included, $</td>
<td>19.80</td>
<td>5.19</td>
<td>12.91</td>
</tr>
<tr>
<td>17. Margin Over All Costs Per Head Sold, $</td>
<td>47.39</td>
<td>11.90</td>
<td>30.38</td>
</tr>
<tr>
<td>18. No. of Feeder Pigs Sold Per Farm</td>
<td>68</td>
<td>23</td>
<td>43</td>
</tr>
<tr>
<td>19. Average Wt. of Feeder Pigs Sold, Lbs.</td>
<td>52</td>
<td>61</td>
<td>57</td>
</tr>
<tr>
<td>20. No. of Market Hogs Sold Per Farm</td>
<td>1430</td>
<td>1077</td>
<td>1246</td>
</tr>
<tr>
<td>21. Average Wt. of Market Hogs Sold, Lbs.</td>
<td>230</td>
<td>227</td>
<td>229</td>
</tr>
<tr>
<td>22. Pig Death Loss, Birth to Weaning (% of Far. Live)</td>
<td>15.84</td>
<td>19.48</td>
<td>17.44</td>
</tr>
<tr>
<td>23. Pig Death Loss, Weaning to Mkt. (% of No., Weaned)</td>
<td>6.70</td>
<td>7.86</td>
<td>6.81</td>
</tr>
<tr>
<td>25. Average Sow Herd Size, No. of Head</td>
<td>123</td>
<td>102</td>
<td>111</td>
</tr>
<tr>
<td>26. No. of Sows Per Boar</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>27. No. of Litters Weaned Per Farm</td>
<td>222</td>
<td>173</td>
<td>195</td>
</tr>
<tr>
<td>28. No. of Litters Weaned Per Sow Per Year</td>
<td>1.78</td>
<td>1.69</td>
<td>1.73</td>
</tr>
<tr>
<td>29. No. of Pigs Weaned Per Litter</td>
<td>8.08</td>
<td>7.46</td>
<td>7.79</td>
</tr>
<tr>
<td>30. No. of Pigs Marketed Per Litter</td>
<td>7.02</td>
<td>7.30</td>
<td>7.04</td>
</tr>
<tr>
<td>31. No. of Pigs Weaned Per Sow Per Year</td>
<td>14.42</td>
<td>12.62</td>
<td>13.50</td>
</tr>
<tr>
<td>32. No. of Litters Weaned Per Crate Per Year</td>
<td>7.86</td>
<td>6.82</td>
<td>7.22</td>
</tr>
<tr>
<td>33. No. of Pigs Weaned Per Crate Per Year</td>
<td>63.33</td>
<td>50.68</td>
<td>56.15</td>
</tr>
<tr>
<td>34. Pounds of Grain Per Cwt. of Pork Produced</td>
<td>304</td>
<td>341</td>
<td>325</td>
</tr>
<tr>
<td>35. Pounds of Supplement Per Cwt. of Pork Produced</td>
<td>78</td>
<td>88</td>
<td>82</td>
</tr>
<tr>
<td>36. Total Pounds of Feed Per Cwt. of Pork Produced</td>
<td>381</td>
<td>429</td>
<td>408</td>
</tr>
<tr>
<td>37. Cost of Ration Per Pound, $</td>
<td>.0654</td>
<td>.0673</td>
<td>.0658</td>
</tr>
<tr>
<td>38. Hours of Labor Per Cwt. of Pork Produced, Hours</td>
<td>0.67</td>
<td>0.87</td>
<td>0.79</td>
</tr>
</tbody>
</table>

* Provided by Dr. Emmett Stevermer, Extension Livestock Specialist, Department of Animal Science, Iowa State University, Ames, Iowa.
producer is likely to consider in these important ways: 1) Most everyone already has a set of tax and financial management records; many hog producers have little else. 2) Rules for keeping these records and making the calculations are set by the Internal Revenue Service and the financial institutions; there is no comparable authority for breeding records, performance records, cost-of-production records. 3) Help is readily available from the IRS, tax consultants, accountants. These differences lead you to consider this area first and to build your hog enterprise records around the tax and financial management hub. However, you can’t completely forget your desires for information about the hog enterprise as you develop this area. You may want to expand your tax and financial management records to gather and store data to measure pork produced, feed conversion, rate-of-gain, hog enterprise costs and returns.

Cost-of-Production Records (EC-598)

Cost-of-production records can serve as the prime tool for evaluation, troubleshooting, and planning. These are sometimes called enterprise records; the process of accumulating them is sometimes called cost center accounting. In any event, they are generated by separating the costs and returns of a single enterprise (e.g., hog production) from the other enterprises on your farm. The goal is to decide whether the enterprise is profitable, and if not, why not.

Every hog producer is a prospective user of cost-of-production reports. But, unlike tax and net worth and cash flow reports, no one is pressuring you to produce these. So you must make your own decision. How important is it to you to have the answer to questions like these: What does it cost me to produce a hundredweight of gain? What is my feed cost? Are my hogs making or losing money?

The best way to demonstrate the importance of cost-of-production records is to show the range in profits and costs that exist in the real world. Table I-1 is a summary of the 1982 swine enterprise records from a group of 147 Iowa farms. This summary includes more than cost-of-production information; only the first 17 lines are devoted to that. Lines 18 through 38 provide information on physical performance; those concerns are dealt with in EC-601, Records to Measure Production and Productivity and to Monitor Herd Health. In preparing Table I-1, the farms were divided into high profit and low profit groups. The per unit profit margin (line 16) is almost four times greater on the high profit farms. Total cost-of-production (line 14) is 27% lower. With such differences, it is critical to know how your unit is performing.

The opportunity for comparison is a great advantage for those joining a record-keeping group. It is likely to be a serious limitation of a system built around a personal microcomputer. For instance, it may not be very revealing to know that your feed cost (line 9) is $28.70 per cwt. of pork produced until you realize some of your neighbors have a similarly measured cost of $24.87. Much of the advantage of cost-of-production data is lost if you do not have an opportunity to compare. Without a comparison, you may not be able to distinguish between good performance and bad.

Beginning, as everyone does, with a set of tax records, the extra effort to generate cost-of-production information is modest but not trivial. The hog producer who pays his taxes on a cash basis has no need for inventories in his tax accounting. However, he needs accurate inventories of the number, weight and value of hogs, and of the weight and value of feed and supplies to generate cost-of-production information. For income tax purposes, the hog producer needs to report dollar income from the sale of animals (no need to know how
Exhibit I-1. Setting Priorities for Your Record System

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Report or Measure</td>
<td>Already Done?</td>
<td>Data Available</td>
<td>Importance</td>
<td>Ranking</td>
<td>Frequency</td>
</tr>
<tr>
<td>1. Taxable Income</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Income Statement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Net Worth</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Cash Flow</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Cost-of-Production</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) Feed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(b) Other variable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(c) Fixed costs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Breeding Herd</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) Boar performance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(b) Sow life history</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Inventory</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) Animals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(b) Feed and supplies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Production and Productivity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) Feed efficiency</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(b) Sow herd</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(c) Growing-finishing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(d) Facilities use</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(e) Labor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(f) Herd health</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

many were sold or their weight). He also needs to have records of farm business expenses for fertilizers, seed and fuel (no need to know the amount or value of corn that the hogs ate!), and of the total expense for veterinary and purchased feed ingredients (no need to separate the hog share of such expenses from the laying flock or the dairy cows!). EC-598 (Section III) shows you how to gather that data and to resolve some other sticky problems: 1. How should the hogs be charged for capital assets (e.g., trucks, tractors, buildings) that they share with other enterprises? 2. How should the hogs be charged for items that come from common storage or that are measured with a single meter (e.g., electricity, fuel, soybean oil meal)?
Records for Breeding Stock Selection and Culling (EC-599)

Any hog producer with a sow herd needs an information system to guide his decisions about which animals should enter the breeding herd (selection) and when to dispose of animals currently in that herd (culling). Since there is no uniformity from farm to farm in the way producers obtain genetic material, there can be no single record-keeping procedure appropriate for all. A seed stock producer or a commercial producer operating a closed herd has entirely different information needs than one who purchases boars for a rotational crossing system.

There has always been confusion among individual producers about the appropriate expenditure of time and energy in generating information for culling and selection. For instance, a continuing problem is that most forms and procedures have been developed for seed stock producers. This has misled many of the commercial producers who follow a rotational crossing system. They have been encouraged to place excessive emphasis on evaluating individual sows and to neglect information that is more important to them. For these, the important information will guide them in selecting breeds and in selecting boars within breeds. They also need a system to identify the breed composition of sows so they can avoid mismating and maximize heterosis.

Commercial producers are currently considering a host of relatively new practices to improve their genetic base. Deciding upon an appropriate set of breeding herd records is further complicated by this interest in closed herds, the use of crossbred boars, the production of terminal crosses, etc. EC-599 (Section IV) includes a discussion of these issues as well as specific recommendations for breeding herd records of three levels of complexity.

Records for Inventory Control, Communication, and Scheduling (EC-600)

Inventories have a variety of uses. They are needed for the cash flow projections and the net worth statements discussed in EC-597 (Section II). They are needed for the cost-of-production calculations described in EC-598 (Section III). They are needed to make a number of the productivity calculations (e.g., feed conversion, rate of gain, pigs per sow per year, etc.) defined in EC-601 (Section VI). In addition to these many uses, inventory data takes on a value of its own. There is a discussion in EC-600 (Section V) of the procedures for taking inventory and using the data to monitor animal performance and the accuracy of ration formulation. The procedures discussed also provide accountability in 1) the use of drugs and other feed additives, and 2) the production, flow, and disposition of animals.

Records for communication and scheduling are a modern phenomenon. Their importance is tied to the development of large specialized hog production units that use expensive facilities. Procedures for communication are needed whenever more than one person is involved in the hog production enterprise. Whenever the management of capital and labor is important, devices are needed to plan and monitor production schedules. Records for communication and scheduling are very different from the other records discussed. One important difference is that the value of these is gone when the message is transferred and the schedule met. There is no value from storing or summarizing these records. Therefore, an important goal in choosing devices is to have them simple and either disposable or reusable. EC-600 (Section V) includes a description of devices and procedures and suggestions for their use.
Records to Measure Production and Productivity and to Monitor Herd Health (EC-601)

In managing your hog enterprise, it is of critical importance to know how much you are producing and at what level of performance. To gain this knowledge, you must choose appropriate measures and find a source of standards for comparison. Then, to profit from the exercise, you must use the results in troubleshooting. EC-601 (Section VI) provides a long list of measures with calculational definitions and performance standards. It includes some recording and report forms with example data when that is appropriate.

There are a number of issues to consider in planning the use of performance measures in your business. These are discussed in some detail in EC-601 (Section VI). Here is a short summary:

--The list of suggested measures is endless. For instance, Table VI-l lists 47. Since it is not feasible to make all these measurements, you must choose among them. In choosing, consider the value of the measure to you and the cost of obtaining it. Avoid placing all your emphasis on the sow herd. This has been a common error in the industry. It probably results from the fact that it's much easier to count piglets than to weigh feed or shoats. However, economics dictates a shift in emphasis to post-weaning performance.

--Many published goals are not appropriate targets for you. You need to establish goals that are economically sound and achievable. The best standard for comparison may be the history of performance on your farm. The best goal is probably the performance of the most efficient producers in your locale who use production practices similar to yours. Lines 17 through 38 of Table I-l provide such goals for Iowa producers. Notice that the high profit Iowa producers weaned 14.42 pigs per sow per year in 1982 (line 31 of Table I-l); this is a long way from the 20 to 22 you are led to set as a goal.

--There is great variation from producer to producer and from organization to organization in the calculational definitions used for various measures. If you do not know how the published performance measure was calculated, you cannot compare with performance on your farm. In response to this problem, included in Section VI is a long list of calculational definitions along with standards for performance calculated according to those definitions.

--The information provided by measures of performance is historical. By definition, many of the measures (e.g., pigs per sow per year) are calculated infrequently. If the only source of production and productivity feedback comes from these, management is often led to "close the barn door after the horse has run away." The measures discussed in EC-601 (Section VI) should be supplemented by other procedures to provide more timely feedback. Some examples are routine observation (the eye of the master), inventory control as discussed in EC-600 (Section V), electronic and mechanical devices to monitor water consumption, feed consumption, etc.

DEVELOPING YOUR HOG RECORD SYSTEM

The preceding text was to help you develop an appreciation for your record keeping needs along with some sense of priority. We must now get more specific. What is important to you? Where should you begin? Several tools are provided in this publication to help with those questions:

Producer Questionnaires

Early in each publication, you will find a questionnaire. Its purpose is to probe the value to you of the record
keeping described there. Spend some
time with the producer questionnaires
before you begin preparing a priority
list of reports (Exhibit I-1).

Tables and Exhibits

These publications contain 14 tables
and 18 exhibits. Several are designed
to show the sources and use of data and
data flow from recording forms to
reports (e.g., Table VI-1, Exhibit II-
1). Some are copies of recording forms
and reports used by individual producers
and by record-keeping services (e.g.,
Table II-1, Exhibit I-3). Several are
designed to help you estimate the impor-
tance of records of a particular kind
(e.g., Table IV-2, Exhibit V-2). Some
provide performance standards (e.g.,
Tables 1, 2, 3, and 4 in EC-601 (Section
VI)).

Recording Forms and Reports (EC-602)

Also offered with these publications
are 27 Recording Forms and 7 Reports.
These forms are described in the various
sections. As they are described, the
use of most of them is demonstrated with
sample data. For the various measures,
these forms and the examples will give
you a clear idea of the data required
and the calculational problems. Some
will want to adapt a selection of these
forms for use on their farms. For their
convenience, a packet of blank Recording
Forms and Reports (EC-602) is available.

Calculational Definitions

For each measure you want to use in
evaluating your hog farm, you need a
precise calculational definition. With-
out that you will fail to develop informa-
tion that can be compared to the per-
formance of your business in earlier
periods or to the performance of others.
And until you have a calculational de-
inition, you cannot evaluate either your
ability to make the measurement or the
cost to you of doing so. Calculational
definitions are provided throughout the
various sections. For instance, you
will find a calculational definition of
herd feed efficiency in EC-601 (Section
VI). The definition shows the data
needed for that particular measure:
1) beginning and ending inventories in
terms of the weight of animals and feed
ingredients, 2) the weight of animals
and feed purchased, 3) the weight of
animals sold, and 4) the weight of
home grown feed used by the hogs.

Exhibit I-1

Exhibit I-1 is a tool to help you
decide where to place your emphasis.
The reports and measures listed in the
left-hand column represent some of the
more important items described in this
publication. Use this list as a guide
but add or delete items to reflect your
needs. You may want to be very spe-
cific. For instance, you may list Pigs
weaned/sow/year or Average daily gain as
measures of productivity (Report #8 in
Exhibit I-1).

In column B, write "yes" if you
already prepare the report or make the
measurement; write "no" if you do not.
It is important to identify what you are
already doing because you are very
likely to build upon that.

For column C, make an evalua-
tion of the availability of the necessary
data and the cost of gathering it. Refer to
the calculational definitions already
discussed. Score availability on a
scale of 0 to 5. A zero means you are
unable to collect the necessary data. A
5 indicates you are already gathering
it.

In column D record a score indicating
the importance of the particular mea-
sure. A zero indicates it has no value
to you; a 5 that you consider it very
valuable.

Rank the reports and measures in col-
umn E according to your evaluation of
the combination of the two preceding
columns. Is it important? Can you col-
lect the needed data?
Finally, in column F, note how often you think a measurement should be made or a report generated (weekly, monthly, quarterly, annually). In completing this column, consider the use of the report as data for other reports. For instance, you might decide you need an annual inventory (Report #7 in Exhibit I-1) to account for the supply and disposal of animals (as discussed in EC-600, Section V). However, an animal inventory will also be necessary to calculate cost-of-production which you may want quarterly, and to prepare a cash flow projection which you may want monthly.

Exhibit I-2

This flowchart shows the relationship between the recording forms and reports described in this publication. A few minutes of studying this should help you understand what follows. It shows the sources of data (circles) and the reports generated from that data (squares). It shows the flow of information among these. In Exhibit I-2, recording forms and reports are identified with the same combination of Roman and Arabic numerals as used in the lists at the opening of this publication and accompanying the description of them in the text. For instance, Recording Form II-1 is the first such form described in EC-597 (Section II). Prepare your own flowchart. It will be invaluable in developing your comprehensive record system.

THE MECHANICS OF RECORD KEEPING

Gathering the Data

One of the themes of this publication is: "Do not gather data that isn't required or that isn't likely to be useful." After you have decided which data to gather, you need to decide who is going to collect it, where, and how. The job of the data gathering system is to encourage accurate and faithful recording, to insure safe storage, and to facilitate retrieval and summary.

Fortunately, most financial data is generated in the farm office, and the rules for tax filing and for preparing financial statements vary little from farm to farm. But observations of animal health and performance must be made in company with the hogs. And, although hogs are occasionally brought to a scale room and litters of pigs are sometimes processed in a room separate from the sows, most observations are made where the hogs are housed. Listed here are three data gathering procedures deserving serious consideration:

--Forms at the observation point. The most common example is the individual litter card fastened to the farrowing crate. But Recording Forms VI-2 (farrowing), VI-6 (nursery, growing-finishing), and VI-7 (gestation) in this publication are other examples. These forms are well adapted to use in fully enclosed buildings where they can be protected from the weather. You can use them in outside lots only if protection (e.g., mailboxes mounted at convenient spots) is provided. As long as a pencil is available, these forms do a good job in encouraging recordings. This is because the forms are readily available to make notes whenever an observation is made. However, there can be a serious problem with lost data because such forms do get lost in the manure pits and eaten by the hogs. When these forms become part of the permanent records, an additional problem arises. Flies and hog house odors are offensive in a clean office and especially in a home office. You can help resolve these problems by keeping duplicate records --an office and a hog house copy. The office copy may be stored in a computerized system.

--Forms designed for use with a clipboard by a person whose job it is to make observations directly. An example is Exhibit I-3, designed by a microcomputer software firm. There is a serious disadvantage to this procedure. The recordings may not be made
Exhibit I-3. Daily Data Gathering Sheet to be Used With a Clipboard*

<table>
<thead>
<tr>
<th>Breeding</th>
<th>Pregnant</th>
<th>Weaned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sow</td>
<td>Boar</td>
<td>Boar</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Farrow</th>
<th>Piglet Transferred</th>
<th>Piglet Died</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sow</td>
<td>Born</td>
<td>Live</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Addition to Herd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sow</td>
</tr>
</tbody>
</table>

*From, The Swine Management Program, Agway R & D, Box 4933, Syracuse, NY 13221.
Exhibit I-4. Two-page Spread from a Shirt-Pocket Book for Data Gathering*

<table>
<thead>
<tr>
<th>DAY OF WEEK</th>
<th>Feed Delivered/Ground:</th>
<th>DAY OF WEEK</th>
<th>Breeding - Farrowing Production:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Weight</td>
<td>Total Cost</td>
<td>Drug Cost</td>
</tr>
<tr>
<td></td>
<td>Gestation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Farrowing</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nursery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finisher</td>
<td></td>
<td></td>
<td>Drug Cost</td>
</tr>
</tbody>
</table>

Hog Movement:

<table>
<thead>
<tr>
<th>Moved From No.</th>
<th>Average Weight</th>
<th>Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farrowing (Weaned)</td>
<td>Nursery</td>
<td></td>
</tr>
<tr>
<td>Nursery: Sold</td>
<td>Kept</td>
<td></td>
</tr>
<tr>
<td>Gro-Fin: Sold</td>
<td>Kept</td>
<td></td>
</tr>
<tr>
<td>Added - Kept No.</td>
<td>Average Weight</td>
<td>Added - Purchased No.</td>
</tr>
<tr>
<td>Boars</td>
<td>Boars</td>
<td></td>
</tr>
<tr>
<td>Gilts</td>
<td>Gilts</td>
<td></td>
</tr>
</tbody>
</table>

Suckling Pig Deaths

SALES No. Total Weight Total Income

* From Hog Log, Pig Improvement Company, Inc; Franklin, KY 42134

(where is the clipboard when you need it?) or they may be made on matchbook covers and shirt cuffs. This procedure works well where there is a resident manager who routinely sees each animal at least twice daily. Permanent records are generated in the office. A microcomputer can solve the data sorting problem you would otherwise have with this procedure and it will provide for safe data storage, retrieval, and summary.

--Shirt-pocket book. Exhibit I-4 is a 2-page spread from a book designed for daily data collection. The advantages and disadvantages are essentially the same as with forms designed for use with a clipboard. But, because of its small size, the shirt-pocket book can be protected and available for recording whenever an observation is made. It fits the situation where the same person is doing the work and making the observations.

You may choose a mix of these three data gathering procedures. A well-designed system might use hanging forms whenever they can be protected, a clipboard to gather data routinely from hanging forms, and a shirt-pocket book to record information in outside lots where there is no protection for hanging forms.
There is need for imagination in the design of recording forms. You should identify a good general form then personalize it and have it reproduced. There will be items that you want to record which are of little or no interest to the typical producer. The unique features are likely to be in the areas of animal health, husbandry and scheduling.

Be sure the data you are gathering will be adequate for all the uses you plan for it. For instance, in choosing forms to gather inventory data, consider that the same data may be used to prepare a net worth statement for your banker, to calculate cost-of-production, and to prepare your tax report (even if you calculate your taxes on a cash basis, you need a depreciation schedule). It would be a shame to have to gather essentially the same data three times to generate three separate reports.

Data Processing

The arrival of the age of the computer has brought a range of choices among processing services. The choice has been made difficult by the silly aura of mystery and the suggestion of superior intelligence that has built up around the computer. Adding to the confusion is the competition for sales between the many firms selling personal computers and software packages for them.

Listed here are the commonly considered methods of processing hog record data; you'll find these listed across the top of Exhibit I-5.

--Hand-prepared records. These are defined to include any system of preparing reports by hand with mechanical aides limited to an adding machine or an electronic calculator.

--The microcomputer is assumed to be on the farm. It has the capacity to store data on tapes or discs, to prepare printed copies of rather elaborate reports, to provide visual display. Satisfaction is currently limited by the shortage of appropriate software. It is often difficult for purchasers to obtain training in the use of software packages and help when they encounter problems.

--Record services are usually offered by organizations that provide other services to hog farmers: the agricultural colleges, farmer organizations, farm supply firms, consultants, etc. They generally process farm records with main-frame (remote) computers which are used to perform a variety of other functions (billing, preparing mailing lists, etc.) and which have great calculational capacity. One problem is that the computers are "remote" so turnaround is often slow and the correction of errors difficult. Satisfaction has been limited by the commitment of the sponsoring organizations to servicing hog producer records and by the availability of service personnel to instruct, interpret, correct, etc.

Listed below are the desirable characteristics of a data processing service for hog farm records. You'll find this same list on the left side of Exhibit I-5.

1. Confidential - The privacy of your data will be respected.

2.Comparable - Because uniform accounting rules and calculational definitions have been used, your data can be compared with other hog producers.

3. Development - There are built-in procedures to identify ideas for improving the service and to put them into effect.
Exhibit I-5. Criteria for Choosing Data Processing Services*

<table>
<thead>
<tr>
<th>Desirable Qualities</th>
<th>Hand Prepared Records</th>
<th>Micro-Computer</th>
<th>Record Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Confidential</td>
<td>X</td>
<td>X</td>
<td>?</td>
</tr>
<tr>
<td>2. Comparable</td>
<td>?</td>
<td>?</td>
<td>X</td>
</tr>
<tr>
<td>5. Fast turnaround</td>
<td>?</td>
<td>X</td>
<td>?</td>
</tr>
<tr>
<td>6. Access</td>
<td>X</td>
<td>X</td>
<td>?</td>
</tr>
<tr>
<td>7. Flexibility</td>
<td>X</td>
<td>X</td>
<td>?</td>
</tr>
<tr>
<td>8. Accuracy</td>
<td>?</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

* An "X" indicates that this is usually a point in favor of the particular system. A "?" indicates some question about the possibility of obtaining the desirable quality from the service in question.

4. Supervision - Help is provided for understanding the system, interpreting results, making corrections, etc.

5. Fast turnaround - Accurate reports are provided in time for the information to be of the greatest value.

6. Access - The stored data are readily available for corrections, additions, deletions.

7. Flexibility - There is opportunity to individualize the reports to satisfy the unique needs of your business.

8. Accuracy - There are procedural and accounting (e.g., double-entry bookkeeping) rules to minimize errors and detect them quickly when they are made.

Exhibit I-5 is designed to help you choose among data processing services. Some producers will decide to take advantage of the strengths of a couple of systems. For instance, a record service (data mailed to a central location and processed by a mainframe computer) might be used for cost-of-production records and accounting where expert help and a comparison with other farms are important. A personal microcomputer might be used for scheduling and for breeding stock selection where the ability to generate a report quickly and the opportunity to individualize the report are important. Most producers will not be able to justify duplication and will be forced to choose a single data processing system.

Report Writing and Summary

Most records are of no value until the data have been summarized and are available in a form that will guide you in making decisions. For instance, it doesn't help to know that you spent $10,000 for L.P. gas last year. You need to know where it went: To heat your home, to dry grain, to heat the hog buildings. And usage needs to be related to production: What is it costing to dry a bushel of corn? To provide heating fuel for each pig produced? This information permits comparison with other producers, other fuels, other facilities, and it supports decisions.
How often should summaries be prepared? Some short-term reports are valuable; others are not. Make a decision on a reasonable frequency for generating particular summaries after consideration of:

--The needs of management. For instance, on a farm where a weekly farrowing schedule is followed, it's important to know each week how many sows have been bred. It may well be possible to make an adjustment this week to correct for last week's problem.

--The cost. The preparation of reports requires time and energy. It may also impair animal performance (e.g., weighing creates stress).

--The unavoidable errors in some data. For instance, there may be a problem with short-term financial data because of lags in billing. On a monthly report of cost-of-production, how will you charge property taxes that are typically paid only twice a year? Inventories always present an accuracy problem. Therefore, prepare summaries that involve inventory data only when needed.

What should the summary look like? The format and content of your income summary for tax purposes is dictated by the Internal Revenue Service. And your lender will probably want to impose his rules on the development of your net worth statement and cash flow projections. Any other summaries you generate are your own responsibility. Here are some things to consider:

--Generate summary data that will be useful in planning. For instance, the planner needs to know how much labor, fuel, feed it takes to produce a hog. He needs to know how much production to expect from his facilities.

--Prepare a summary report that truly summarizes. For instance, data scattered on individual litter cards is of little if any value as a guide to culling and selection. To be useful, it needs to be summarized onto a life history chart for each sow. And the evaluation procedure can be further improved by summarizing the life history data into a single number, a performance index.

--Use graphics where appropriate. For some data, a picture (graph) is really worth a thousand numbers. Examples are graphs to show seasonal patterns of conception and health problems.

--Calculate performance measures that can be compared with other producers. To do this you need to adopt the commonly accepted calculational definitions. Use this publication as a source. The National Pork Producers Council is currently involved in the development of definitions for the industry.

--Adopt a format that gives a side-by-side comparison between expected results and results achieved. Excellent use can be made of this format in deciding what went wrong with your cash flow projection. It can also be used with physical performance measures. Some producers set "target" values for important measures (number of pigs weaned, weaning weight, etc.) and study variation from the target as a method of tracing problems and rewarding labor.

Data Storage

Pertinent information must be sorted and stored so it can be located when needed. Without a data storage and retrieval system, the value of all your records will be greatly reduced. You must set up a record-keeping work area (office) and a filing system. For detailed recommendations, contact either the Home Economics or Agricultural Economics Department at your nearest agricultural college. But, here are some filing ideas for your hog records:
You'll need storage for raw data. Federal tax regulations require you to keep some of these data: bills, receipts, cancelled checks. Some you'll want to keep even though it's not required. And some you are not required to store and will be anxious to dispose of; the odorous forms that have been hanging in farrowing houses, nurseries, etc., will be unwelcome in an in-home office.

Most raw data will be transcribed (posted) to some data consolidation form, and these will need to be filed: farm account books, life history records for sows, and forms designed especially to accumulate the data necessary to calculate cost-of-production and various physical performance measures. With the adoption of personal computers and of remote terminals for main-frame computers, raw data will be placed directly into storage on discs and magnetic tapes. Disc and tape storage will be organized so data can be removed and subjected to various sorting and calculational procedures.

Summary reports will be generated, and they need to be stored separately: tax returns, cost-of-production, net worth, cash flow. Developing a separate file for each of these reports will facilitate a comparison with performance in previous periods and with projections.