

Sponsors

University of Minnesota

College of Veterinary Medicine

College of Agricultural, Food and Environmental Sciences

Extension Service

Swine Center

Management accounting standards for pork production

E. Allen Lash

Chairman, NPPC Management Accounting Standards Committee

CEO, Agro Corporation/AgriSolutions Inc.

There are four parts to every business: assets, liabilities, equity (The Balance Sheet), and operations (The Income Statement). In cost accounting, all activities and functions of the operating (operations) part of the business are segregated into various cost and profit centers. Using cost and profit centers has been the accepted cost accounting methodology in business for decades. Agriculture has traditionally used enterprise accounting instead of cost accounting. Cost accounting and enterprise accounting typically do not provide the same results for management.

It is important to understand how cost accounting fits within the total accounting equation. Cost accounting focuses on the financial activity occurring primarily within the income statement and for NPPC Standards, assets are also included.

In current agriculture accounting, assets have rarely been tied to the various cost and profit centers; however, NPPC Management Accounting Standards have made that link. Therefore, if you wish to calculate all of the pork ratios, it will be important to tie each asset to one or more cost or profit center.

It has been difficult in agriculture to tie assets to cost and profit centers. This due to the fact that many assets are used across numerous profit and cost centers. That factor tends to make the asset tie-in more difficult (for example, how do we allocate feed processing equipment for breeding, nursery, and finish, or farm equipment used to pro-

duce crops and haul manure or transport feed?) Assigning assets to cost and profit centers is controversial, but only in agriculture. It has substantial value in measuring financial performance through the NPPC ROE (DuPont) Model.

Liabilities and equity have little relevance in the cost accounting structure. If assigned at all, they are assigned as their percentage of assets (i.e., if pork assets are 74% of all assets, then 74% of liabilities and equity are assigned to pork).

If we view the total financing accounting system as having three primary purposes

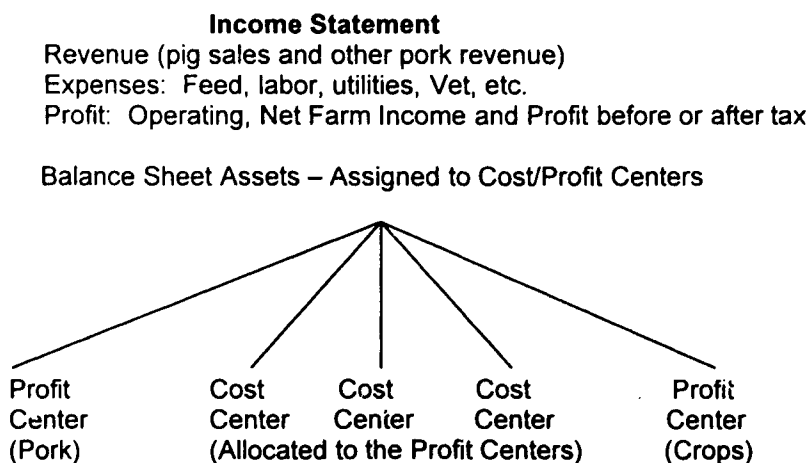
- management/profit,
- credit, and
- compliance tax,

then we better understand the purpose and focus of cost accounting.

Historically, agriculture has used its accounting data in reverse order: tax, credit, and management (profit). However, future results-oriented businesses will focus on the new priority of management, credit, and tax. Frankly, without profit, there is no tax to pay and, in the long-term, no available credit.

Cost accounting is primarily used for management. It has no value or purpose for tax. In a great number of instances,

Figure 1. The Income Statement and Balance Sheet Assets



even credit is not concerned with cost accounting. Credit tends to evaluate the entire business, without breaking out the separate profit centers of the operation. This is not to say that all lenders have little interest in cost accounting. Historically, agriculture has not been able to provide to lenders and others adequate cost accounting information or enough industry standardization to provide a meaningful evaluation of pork cost accounting data. We should, with the NPPC standards initiative, be able to provide excellent cost accounting information in the future.

From a profit/management viewpoint, agriculture has primarily been focused on enterprising rather than cost accounting. As agriculture becomes more sophisticated with larger operations, we will see enterprising lose favor. Cost accounting and/or process cost accounting will be the “best practices” for determining profitability, managing the results of various pork production/service processes or activities (process cost accounting) and accumulating cost of production information (break-even). Many large pork organizations will go one step further and maintain costs and profits by group/pen.

Cost accounting

The accounting process of dividing the operating portion of the business into profit making (profit center—pork, corn, beans, beef, dairy, etc.) and high level support function/activities (cost centers). Total Pork (cost accounting—separates pork from the other profit centers). The purpose is to determine the profitability and/or costs of various operating areas and measure management performance.

Process cost accounting

The accounting process of dividing pork into various support operations and production stage activities and/or functions (cost centers) that are ultimately allocated to one or more pork profit centers. These cost and profit centers should be organized to mirror exactly the owner’s management organization structure. For pork process cost accounting, the total pork profit center is divided into numerous activities or functions. The two pork production cost center groupings are support operations (there are up to 12 suggested subgroups within support operations) and production stages (which has 3 subgroups breeding, nursery, and finish). The four potential profit centers are weaner, nursery, finisher, and genetic premium sales. The profit centers receive, in addition to support operations and production stage allocations, allocations for entity general and administrative and financing costs. The purposes for utilizing process cost accounting are primarily to:

- measure/monitor management performance at each cost center group or sub-grouping activity;
- enhance profitability; and,
- determine costs.

Process cost accounting by group

Process cost accounting by cohort/group is exactly the same as process cost accounting with the excep-

tion that the profit centers (weaner, nursery, and finisher sales) are further subdivided into cohort groups. the sum of all cohorts equals the totals of the profit centers (i.e., finisher sales). This accounting process can be accomplished with or without the use of work in progress (WIP) accounting practices. Adoption of this accounting process should be implemented with caution because of the time and expense associated with accurate implementation. Unless there are full-time accountants on staff and good methods for collecting data, an operation may want to avoid cohort/group accounting. Each operation will need to decide the value of pen information, especially when the results are not known until the pigs have been slaughtered and it is too late for changes.

There are three basic uses of cost accounting information:

- The **First** and primary application of cost accounting is to provide a mechanism to measure individual manager results, accountability, and responsibility. That means **the cost accounting system should emulate exactly the way the business is run and/or its management organization structure**. To ensure accountability, an individual is assigned to manage each cost or profit center activity and/or function. Effective cost performance accounting as a result provides the mechanism to measure each manager and area of accountability.
- The **Second** use for cost accounting—and the one most traditionally recognized in agriculture—is to determine and measure profit from each of the profit centers. This is an important management and business function.
- The **Third** use for cost accounting is for cost control and break-even analysis. The production break-even is established for major processes (breeding, nursery, and finish) by adding the direct costs for each production stage and the allocated support operations (cost centers) centers. Finally, we combine all four cost processes—support operation centers, production stages, general administrative and financing—to identify the total cost per cwt of pork. This information tends to be used by the production or activity managers and the accounting staff.

For the pork industry, process cost accounting will be the best practice to adopt, followed by cost accounting and enterprising (the latter is used infrequently—mainly by smaller producers). Since process cost accounting has become the norm, the question becomes, “Does an operation use just ‘process cost accounting’ (costs for breeding, nursery and finish) or ‘process cost accounting’ with cohort or pen/group accounting?” NPPC Management Accounting standards permit either.

Enterprising

Cost accounting vs. enterprising

Agriculture has traditionally attempted to obtain cost accounting information from enterprise accounting. The basic difference between enterprising and cost accounting information is the financial approach to management, data interpretation, and the application of data in management decision-making. Enterprising focuses almost exclusively on the profit center and generally has disregarded cost centers. Enterprising

- accumulates the direct income and expenses for profit centers such as corn, beans, hogs, cattle, etc.
- usually ignores the cost centers, such as equipment, overhead, and shop and irrigation costs. Even ag professionals have been overlooking or underestimating an often significant cost component of the farm business. You should be aware of the portion of your revenue that is used by the cost centers.

Traditionally, indirect costs/overhead and other cost centers have been ignored or given very marginal allocation (dollars) in the planning-management process. Financial changes in American agriculture that began in the late 1970s and 1980s should highlight the importance of cost center management. The direct production cost of the profit centers such as corn, beans, hogs, cattle, did not change very much during that period. On the other hand, certain cost center inputs for the same period changed significantly and created major problems for many producers—cost center expenses rose from 15–25% of the total business expenses in the late 1960s and early 1970s to as much as 40–60% of total expenses by the late 1970s and 1980s. Those who understood the difference between direct profit center costs (direct costs only) and profit center costs after cost center allocations obviously fared better. This is a significant management principle. **Chart 1** illustrates in general terms the basic difference in agriculture between enterprising and cost accounting.

Some methods of enterprising attempt cost accounting by assigning all expenses on a line item basis to the various profit centers. However, distributing the charges for insurance, repairs, interest, fuel, supplies and similar costs to profit centers, via line items, is often not practical. All too often in today's computer age, these expenses tend to get lost somewhere in electronic never-never land. Since

Enterprise accounting	
Profit center direct costs	Yes
Cost center direct costs	No
Profit center break-even costs	No

Cost accounting	
Profit center direct costs	Yes
Cost center direct costs	No
Profit center break-even costs	No

most cost center expenses (insurance, utilities, repairs, etc.) are difficult to allocate directly to profit centers, they are often either not assigned to any enterprise, or they are allocated on a line item basis. When expenses are allocated on a line item basis, the user of the information cannot ascertain the direct manageable revenue and costs as opposed to the indirect charges over which the manager may have little if any control.

Process cost accounting

Process cost accounting for pork operations will essentially have the following groups of activities and/or processes:

- production stages,
- support operational centers,
- general and administrative functions,
- financing costs, and
- profit centers.

Production stages

Production Stages are almost inevitably cost centers. As cost centers, this means there is very little (if any income) ever attributed to the production process cost center(s). Production process entails the accumulation of direct expenses and often includes allocations of "support operation centers". These support operation centers are associated with the various phases of pork production. The NPPC Production Standards sub-committee (supported by the financial and management accounting sub-committees) has defined the three pork production processes as follows:

- breeding,
- nursery, and
- finish.

Direct expenses associated with each of the production processes should be accumulated in these production cost centers along with allocations from select support opera-

Process cost accounting

There are five major groupings of cost/profit centers

Production stages	Cost center (allocated to profit centers)
Support operations	Cost center (usually allocated to production stages)
General and administration	Cost center (allocated to profit centers)
Finance	Cost center (allocated to profit centers)
Profit center(s)	Profit center

tions. All of the costs associated with the breeding process would be accumulated in the breeding cost center to provide a total cost of the breeding process. Likewise, the attributable expenses associated with the nursery and finish process would be assigned to those cost center activities. The end result is the total cost for each process: breeding, nursery, and finish.

- isolation,
- nutrient management,
- production management,
- transportation, and
- vet services.

The next cost accounting production process step is to tie those dollar amounts with production units. This converts gross dollars into a meaningful management unit. The production units could be 100 lb. of live gain, per head, per head day, per animal unit, and so on. Accumulating the total dollars and then dividing those dollars by units produced provides management with information that can be used to improve production performance.

Each of these processes is almost always a cost center. All direct expenses and production units associated with each of these support processes are accumulated for reporting purposes. Because the cost for each support process is on one report (just like the production processes) we can now manage that support area.

A good management practice would be to assign an individual to each of those processes to ensure accountability. In fact, a support operation cost center should not be established unless there is an individual manager assigned to the area. This management focus measure the effectiveness of the individual's actual results compared to their projected results for that specific process.

Support processes

Support Processes are processes that are necessary to the continued operation of the business, but are not necessarily directly tied to the production process. Examples of support processes or activities include:

- board stud,
- crew labor,
- equipment,
- facilities maintenance,
- feed processing costs,
- general pork,

General and administration

General and administration (G&A) are expenses associated with ongoing expenses of the business, but are not directly attributable to pork. They include such categories as general business insurance (liability, etc.), professional fees (legal, accounting, tax, etc.), dues, and office expenses (including accounting, human resources, and MIS (computer) personnel). The business may structure

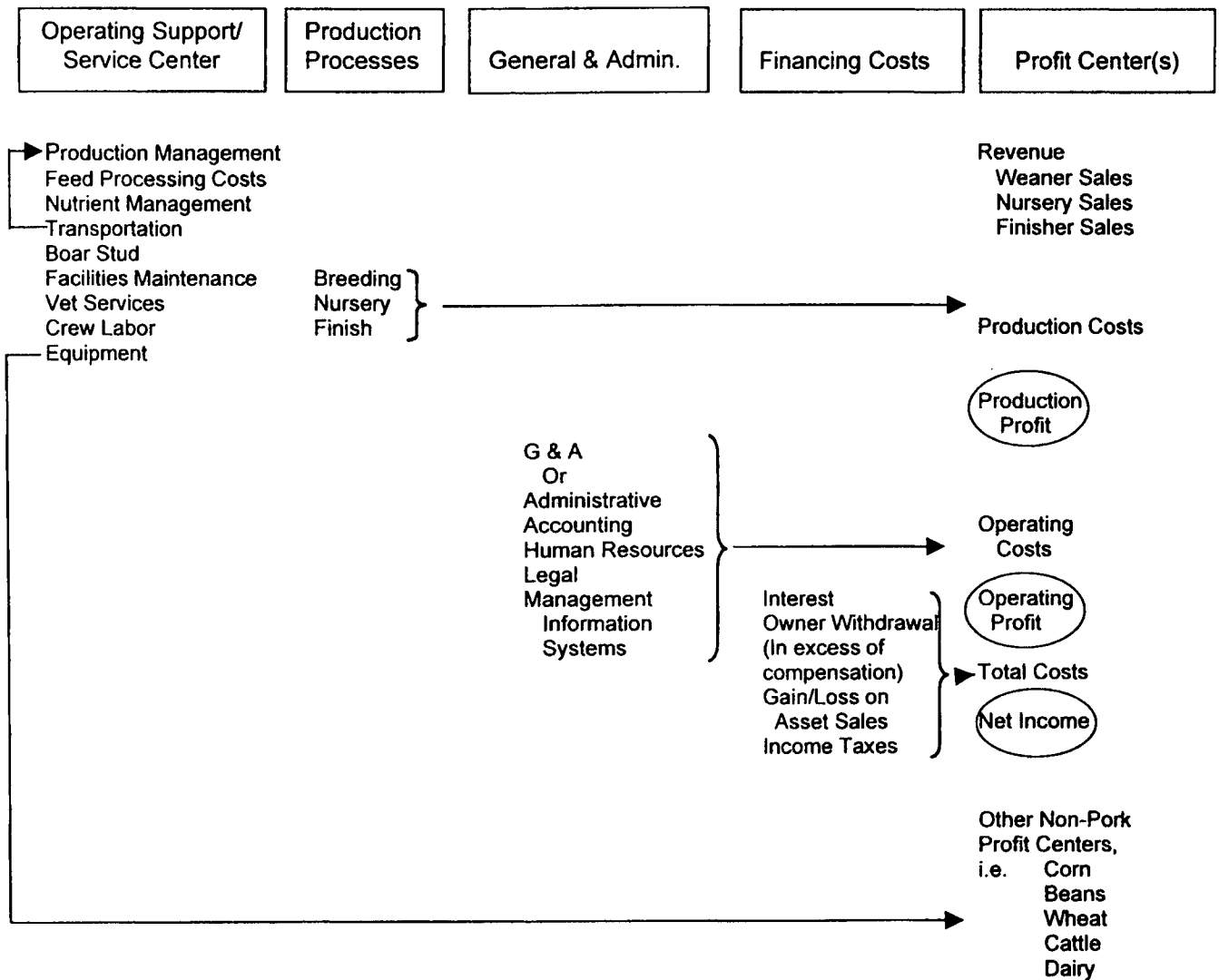
Chart 2. Example of a process-managed operation

First management level	Second management level
<i>Breeding</i>	<i>Owned Facilities</i>
	Nursery
Finish	Jones
	Smith
	Owned
	Brown
	Summers
	Cooper
	Birch
	Hoff,
Etc.	

Chart 3. Cost accounting example

First management level	Second management level
Brighton, IL	Breeding
	Nursery
Finish	
Webster City, IA	Nursery
Finish	
Macon, MO	Breeding
Nursery	

Figure 2. How an income statement should be assembled and allocated using process cost accounting



G&A as one cost center (G&A) or leave a cost center for each of the following:

- administration
- internal accounting
- human resources
- legal
- management information systems

There could be other cost centers also. Again, one of the above should be established only if there is a manager and there is value in managing the activity.

Financing

Financing expenses are costs for financing the business. These costs are typically allocated to the cost/profit centers based on dollars of assets assigned to those centers.

NPPC standards recommend the use of one cost center as a minimum (“financing”) or broken into the following:

- interest
- owner withdrawals in excess of labor and management
- gain or loss on sale of assets
- income taxes

Profit centers

The profit centers accumulate the actual revenues received and/or inventory adjustments resulting from production. The costs directly associated with that revenue (hauling, check off, etc.) are also accumulated in the profit center; these, however, are usually minimal. Also, all cost centers, (i.e., breeding, nursery, finish, administration, feed processing, facilities management, etc.) are allocated to the appropriate profit center. The profit centers could be:

- **Weaner**

The actual sale of weaner pigs (not a transfer price). This profit center would include the actual sale of weaner pigs and only direct costs through the breeding process. Thus the revenue from the sale of the weaner pigs less the direct and allocated expense equals profit or loss.

- **Nursery**

The actual sale of pigs through the nursery stage (not a transfer price). This profit center would include the actual sale of nursery pigs and costs for the breeding and nursery processes. Thus the revenue from nursery pig sales less the direct and allocated costs equals profit or loss.

- **Finish**

The final stage of the pork production process—the sale of finisher pigs. This profit center includes costs for breeding, nursery, and finish.

If an operation sells only finisher animals, it may have only a finish profit center. If it also sells weaner and/or nursery pigs, then it could also have all three profit centers. Each profit center would have its own revenue, direct expense (minimal), and allocations. The income statement for each profit center has process expense totals (traditional cost accounting format).

Pen or group cost accounting

The pen/group concept of cost accounting (job cost accounting) can be incorporated utilizing the same essential disciplines described above. The only change is to assign the expenses and income to each group. When pen/group cost accounting is implemented, the expense and time associated with accounting increases geometrically. The value of pen cost accounting for many producers may be difficult to justify. The exception, of course, is when the pork producer uses contract production. This is true especially if payments to the contract producer are tied to the results of the group. With contract production, the costs are easily attributable to a particular group of pigs because of the segregated facilities.

Cost accounting structure

A correctly structured cost accounting system will always mirror the management/operation structure. For example: is the management/operating structure by process or location? Does the business have a process manager (i.e., a manager for breeding, a manager for nursery, a manager for finish, etc.) responsible for each process across all locations?

If a particular operation is process management-focused (see below), then from a cost accounting orientation the first level of cost accounting should be the process. If a process has multiple locations to manage, the second level of cost accounting should be the different locations. The cost accounting structure shown below is an example of a process-managed operation that uses its own facilities for breeding through farrowing, but contracts most other production processes.

If the management/operation's structure is by location, then a different structure should be used. In this case, we are assuming there is a location manager that has process responsibility or process managers at that location. In these instances, the location would be the first cost accounting level and the process is the second cost accounting level.

The hierarchical cost accounting structure concept is important because cost accounting reporting is used by management to measure the following:

- manager accountability,
- profitability, and
- cost.

As a result, management must be able to quickly see all of the components of their management sphere (i.e., process or location).

Another important attribute of cost accounting's reporting capability is the ability to assemble different cost or profit centers into reporting groups. This simply means specific cost or profit centers can be requested and grouped together to facilitate reporting on nearly any particular groups(s) of cost or profit center processes or activities.

