Cost Accounting for Growing and Finishing Cattle*

By Jim McGrann
Texas A&M University

Cost accounting is the process of collecting and organizing financial data to report costs of production. The ultimate goal of all accounting is to improve business performance; the purpose of managerial accounting (including cost accounting) is to evaluate decisions made and competitiveness. Accurate measuring of historical costs will establish the accountability of the decision maker. Historical costs can serve as a guide for the future, especially when cost composition is reported and linked to production efficiency measures.

True profits (returns to equity) for growing (backgrounded, stocker, or feeder) and finishing cattle are usually determined at the time of purchase or transfer between phases of production. Buy them right or pay the price at the end. Mistakes are made at the beginning, often because of incomplete or inadequate cost of production and marketing information that results in over payment for stocker or feeder cattle. It is important that cost reports clearly separate incoming cattle cost, gain, marketing, and finishing cost. Using the options and/or futures market successfully for price risk management depends on knowing of the "full cost of production."

This article addresses cost accounting, inventory valuation, reporting, and analysis issues associated with cattle lot accounting where revenue and costs can be accurately identified with specific cattle lots. Cost accounting in situations where cattle are not clearly identified with lots, which is frequently the case for stocker cattle, is also addressed. Key information for decision makers is first identified and report content is explained.

Key Decision Information

Growing and finishing cattle is by definition a margin business. It is value added versus cost of gain or added cost. A negative marketing margin or the difference of sell price and purchase price most frequently offsets the feeding or grazing margin. This marketing margin is referred to as the buy/sell margin, or rollback, as the per hundred weight purchase price of the lighter cattle is greater than the sales price.

Marketing margin is the purchase payweight of the stocker (feeder) based on sales and inventory adjustments (to account for cattle not sold) multiplied by the buy/sell margin or the rollback or roll-up (positive or negative margins between buying price and selling price). With a negative marketing margin, the cost of gain has to be less than its market price (sales price) to generate a positive net income.

Grazing and/or feeding margin is the sales price minus the cost of gain multiplied by the net payweight gain. It is a measure of how much the value of gain exceeds the cost of gain. Under normal buy-sell prices, there is a negative marketing margin. The grazing and/or feeding margin must offset this negative margin for the enterprise to generate a positive net income. To generate a profit, the marketing margin plus the grazing and/or feeding margin must be positive.

To accurately calculate these margins for evaluation of growing and finishing alternatives, decision makers need accurate and timely cost accounting information.
Specific data requirements to calculate marketing and feeding margin include:

(1) Payweight of stocker (feeder) cattle and number of head
(2) Payweight purchase cost of cattle
(3) Net payweight and head out when marketed or transferred (for the phase of production)
(4) Payweight gain
(5) Full cost of gain – all costs including overhead and interest cost
(6) Payweight net sales price including inventory value of cattle net sold

---

* Written by James M. McGrann, Professor and Extension Economist, Department of Agricultural Economics,
Texas A&M University, and Daryl Ellis CFO Jorgensen Ranches, Ideal South Dakota, September 27, 2000.

(7) Number of head sold net of death loss

The formulas for calculating margins are as follows.*

Marketing Margin ($hd) =

(((Total Purchase Payweight * .01) * (Sales Price – Purchase Cost)) / Head Out)

Grazing or Feeding Margin ($ hd) =

(((Sales Price – Cost of Gain) * Net Gain * .01 / Head Out)

Net Income ($/hd) =

Marketing Margin + Grazing and Feeding Margin

* All prices and costs are in $/cwt, weights in pounds and margins are in dollars per head out. Payweight to payweights accounts for death loss.

The most important product of the cattle cost accounting system is the cost of gain as it measures both efficiency and competitiveness of the growing or finishing enterprise. The sum of market margin and grazing or feeding margin is net income per head.

Profit and Cost Centers

It is advisable to set up accounting and analysis systems for cattle lots or production year cattle in separate profit centers. Conversely, cost centers are recommend to summarize activities of an organization. For example, grazing cost centers can be used to accumulate costs, and these costs can then be transferred to the appropriate cattle profit center based on an allocation system that closely approximates use of the grazing resource. Defining ranch overhead (general and administration) as a cost center frequently makes accounting simpler and more accurate. A method for allocating overhead costs must be defined. One suggested approach is to allocate indirect cost based on direct cost, but not including the purchase or transfer cost of the cattle. If total direct costs including the incoming base cost (purchased and raised) are used, the allocation in most ranches would be excessive to growing or finishing cattle, as the purchase or the transfer cost of the feeder can be 60 to 80% of the total direct costs. Management may be required to formulate alternative procedures for a mixed livestock crop environment.

Other cost allocation alternatives would be per head or per head day if relative uniform cattle and feeding periods were used. Even if the direst cost method is used, it is advisable to express overhead in a per head/day or month basis because it facilitates communications. Consistency in cost allocation is key for comparative and standardized performance analysis. Overhead cost information is extremely valuable. Decision makers will need to know the "overhead cost" on a per head and per cwt when evaluating alternatives. They must cover overhead before a "true profit" can be achieved. A business will go broke with a sales price that only covers the breakeven direct cost, leaving nothing to cover the business's indirect overhead costs.

Growing Finishing Cattle Revenue and Cost Reporting

Organization and content of revenue and cost reporting is important for comparative analysis and providing useful decision information. Consistency in classification and recording cost is essential to have comparable results. A suggested accounting system reporting format is illustrated in Table 1 and 2 for custom fed cattle and stocker cattle. Presented in Appendix B is an accounting report format for grazing hay, backgrounding, and cow-calf production. Revenue should include sales of market cattle and those culled before reaching intended market weight. Direct expenses are summarized into a sub title for cost of cattle, other direct costs are described. Total direct expenses or the cost of sales can be subtracted from revenue to calculate gross margin. This is the feedyard margin often reported by feedyards as profit (loss). However, this is a misuse of finance terminology and provides misleading information.

A feedyard's typical closeout report will provide sales revenue and direct contracted expenses (see Table 1). The feedyard margin (gross margin) report is insufficient for reporting accurate and complete financial profit for the custom feeder. Managerial accounting systems must record the actual purchased and/or transfer cost of cattle, in freight, financing, and business overhead to accurately measure net income or the contribution to business equity (profit). For grazing cattle, the producers must have an accounting system that captures and allocates all costs including raised feed and pasture costs. General business overhead and financing costs must be included in managerial reports for an accurate representation of profit or loss.

Table 1. Revenue and Cost Summary for Custom Fed Cattle

Lot Number xxx Head* xxxx Net Gain* xxxx

		Total	$/Head	$/Cwt. Gain
	Revenue			
	Cattle Sales			
	Cull Sales			
A.	**Total Revenue**			
	Direct Production Expenses			
	Purchased Cattle for Resale			
	Raised Feeder Cattle (Allocated Expenses)			
	Freight and Trucking			
B.	**Subtotal Cost of Cattle**			
	Other Direct Expenses			
	Contract Production			
	Feed and Yardage			
	Animal Health			
	Insurance			
	Overhead			
C.	**Total Direct Production Expenses**			
D.	**Production Margin (A - C)**			
	Indirect Expenses			
	General and Administration			
E.	**Total Indirect Expenses**			
F.	**Financing**			
	Interest Cost			
G.	**Total Cost of Sales (C + E + F)**			
	Marketing			
	Checkoff			
	Commissions			
	Futures/Options			
	Freight and Trucking			
	Management (including owner)			
	Other Marketing			
H.	**Total Marketing Expense**			
I.	**Total Cost of Before Tax (C+E+F+H)**			
J.	**Net Income Before Tax (A - H)**			

K.	**Cost of Gain Before Tax (I - B)/ Net Gain)***			
L.	**Unit Cost (I. / Net Payweight)***			
M.	**Marketing Margin***			
N.	**Feeding Margin***			

---

*Reported outside the accounting system

Table 2. Revenue and Cost Summary for Stocker Cattle

Lot Number* XXXX Head Out* XXXX Net Gain* XXXX

		Total	$/Head	$/Cwt.
	Revenue			
	Livestock Sales			
	Raised Feeder Cattle		**Out**	**Gain**
	Raised Cull Feeder			
A.	**Total Revenue**			
	Direct Production Expenses			
	Purchased Livestock for Resale			
	Stocker Cattle			
	Freight & Freight and Trucking			
	Death Loss			
	Purchased Stocker			
	Raised Stocker (Allocated Expense)			
B.	**Subtotal Cost of Cattle**			
	Other Direct Production Expenses			
	Animal Health			
	Feed			
	Grazing Cost (at Allocated Cost)			
	Purchased			
	Raised Feed (at Allocated Cost)			
	Insurance			
	Labor & Management (including owner)			
	Overhead			
	Repair and Maintenance			
C.	**Total Direct Production Expenses**			
D.	**Production Margin (A - C)**			
	Indirect Expenses			
	General and Administration			
E.	**Total Indirect Expenses**			
F.	**Financing**			
	Interest Cost			
G.	**Total Cost of Sales (C + E + F)**			
	Marketing			
	Checkoff			
	Commissions			
	Futures/Options			
	Freight and Trucking			
	Management (including owner)			
	Other Marketing			
H.	**Total Marketing Expense**			
I.	**Total Cost of Before Tax (C+E+F+H)**			
J.	**Net Income Before Tax (A - H)**			
K.	**Cost of Gain Before Tax (I - B)/ Net Gain)***			
L.	**Unit Cost (I. / Net Payweight)***			
M.	**Marketing Margin***			
N.	**Feeding Margin***			

*Reported outside the accounting system

Lot Versus Partial Lot Cost Accounting*

Cost accounting for growing and finishing cattle offers special challenges to accurately measure production costs and profitability. There are two situations from an accounting and production data standpoint.

(1) Lot or group accounting – all animals moved in and out together.

(2) Partial lot cost accounting estimates the cost and profitability of sub groups of cattle within the larger group. Partial lot accounting standardized cost based on the allocation method for the given time period. The total of the sub groups equals the cost and net income for the complete group.

Lot Cost Accounting

When the lots or groups of cattle are clearly identified, the beginning or starting date and sales date are similar for all the animals involved. Accumulation of cost is straightforward. It is a "process of" setting up the accounting and production related inventory system to follow the lot. The information system must be designed for proper tracking of costs for each group or lot of cattle. A "lot" may be defined as a fiscal year designation of the cattle group being evaluated, e.g. "199 spring weaned steer calves." All costs, including animal costs, in freight, feed, grazing, processing and health, labor, management, interest, overhead, etc., must be accumulated at the lot level.

The key questions addressed by cost accounting are cost of cattle, cost of gain, marketing margin, feeding margin and net margin. This information should be available for each ranch or subgroup of cattle removed from the total group. Death may be reported separately from cost of cattle; however, death loss should be expensed immediately to avoid improper inventory valuation.

Reports must be designed to easily view factors effective cost of gain, dates for calculation, marketing, and feeding margin as well as inventory valuation.

Proper cost accounting dictates internal transfers should be recorded at cost. As cattle are transferred in or out of the lot, the associated costs must be transferred with the animals. If market price inventory valuations are desired for analysis purposes; market valuation analysis can be accomplished outside the accounting system. This will ensure that all costs can be reconciled through the accounting system.

Partial Lot Accounting

If cattle are moved in or out of a ranch at different time interval cost accounting becomes more complex. Accurately measuring financial performance of cattle going out at different time periods can generate valuable information for evaluating production and marketing practices.

For partial lot accounting, cost accumulation procedures is similar to lot accounting. Partial lot do require adjustments to the "lot" accounting reports. A major adjustment is determining the weighted average cost of cattle. Inventory purchase cost valuation would be the weighted average cost per head multiplied by the head in inventory.

The second adjustment required is the deduction of cumulated direct, indirect and marketing expenses associated with the animals sold. As cattle are sold the "cost of sales" is a combination of the weighted average cost of cattle in the subgroups' portion o direct and indirect accumulated costs. The remaining cost is inventoried and total costs are transferred to the balance sheet as growing or finishing cattle.

When initial purchase or transfer in cost is maintained, then average cost of the cattle is a weighted average cost of cattle. Purchase cost and pounds purchased will provide the cost per pound for cattle going into the group. Death loss is recorded and may be reported separately or if total in cost is used it will raise the average purchase cost of cattle remaining in the enterprise group. Inventory purchase cost valuation would be the weighted average cost per head multiplied by the head in inventory.

When cattle are removed, sold, or transferred, the "cost of sale" is a combination of the weighted average cost of cattle in plus the subgroups' portion of the non-cattle accumulated cost. The remaining cost

* In manufacturing, lot cost accounting is similar to job cost accounting. Non lot accounting is similar to process
accounting.

is inventoried and total costs are transferred to the balance sheet as growing or finishing cattle. When the last cattle are sold, the cost of sales will zero the enterprise or group inventory cost.

Table 3 data illustrate stocker cattle entering on three different dates, weights, and prices. They are inventoried at the end of the fiscal year (if required for fiscal year closing) and then marketed on two different dates. This would not be an uncommon sequence for stocker cattle. Because cattle are mixed, a weighted average cost is used for cattle inventory value as well as in cost of sales. Production costs (using full cost absorption methodology, including finance and general and administrative cost) are allocated to cattle inventory and cost of sales. Cost allocation is based on head days. Death loss has the impact of raising the cost of cattle and reducing sales payweight, which will reduce net income.

The specific records required to implement the suggested methodology includes: total purchase or transfer in cost of cattle, all accumulated cost of growing or finishing the cattle, head days, and head inventory. Head days must be kept both for measuring production (average daily gain) and for cost allocation purposes.

Table 3. Cost Accounting Illustrated for Non Lot Stocker Cattle

Notes: Cattle are not individually identified going in or out by assign weight or cost

Cattle Purchased Dates	Head	Weight	Cost	Weight Lb./Hd.	Cost/Cwt.
1/1/00	30	12,000	$10,800	400	$90.00
10/15/00	50	21,500	$18,920	430	$88.00
11/1/00	20	8,800	$8,096	440	$92.00
Total In (Cattle Inventory)	100	42,300	$37,816	423	
					$/Unit
Weighted Average Cost In($/Cwt.)					$89.40
Weighted Average Cost In ($/Head)					$378.16
Death Loss	1				
Weighted Average Cost Out ($/Head)					**$381.98**

Cost of Inventory or Sales For Cattle

Sales Dates	**Days/Head**	**Cattle Cost**
4/1/01	70	$26,739
5/31/01	29	$11,077
	99	$37,816

Head Days	**Total Days**	**Days/Head**	**Days/Head**		**Inventory**		
			Inventory		Cattle	Cost	Total
As of 12/31/00	7,780	79	79		$37,816	$2,000	**$39,816**
					Total Cost of Sale		
			Out				
Sale 4/1-01	9,009	91	170		$26,739	$4,242	$30,981
Sale 5/31/01 Added	1,740	60	230		$11,077	$2,758	$13,835
Total	18,529			**Total**	$37,816	$7,000	**$44,816**

Other Cost of Sales*

	Total/Head	$/Head	$/Day	$/Day - Out
Cost Accumulated (inventoried) to 12/31/00	$2,000	$20.00	$0.26	
Cost Added to 4/1/00	$4,000		$0.44	$0.36
Cost Added to 5/31/00	$1,000		$0.57	$0.57
Total Cost Accumulated	$7,000		$0.38	

---

*Costs include production, general and administration and financing costs.

Cattle Inventory Equation

To analyze inventory, it is useful to begin reflecting on the base cattle inventory equation.

Beginning Inventory + Purchases - Death Loss – Sales** = Ending Inventory*

* This could be purchases or transferred in from the cow herd at weaning or from other ranches in the same business.

** This could be sales or transferred out to another cattle production enterprise.

For the most accurate measure of production, payweight in and payweight out accurately measures production. Death loss is reflected in payweight out.

Defining Business Intent

When defining the business accounting system and enterprise divisions, it is extremely important to define business intent. For example, is the ranch in the business of marketing weaned calves or producing cattle for a stocker or finished cattle enterprise? Is wheat grown to support the cattle grazing or primarily to produce wheat? Is the ranch in the cattle business or wheat business? Addressing these and similar questions helps the accounting and analysis system designer decide what are the profit centers and what are the cost centers. Definition of intent helps determine reporting, management emphasis, and the managerial accounting systems approach.

For example, if the cow-calf enterprise is a cost center, the focus should be on reproduction and providing an animal that will maximize average daily gain (ADG) at a minimal cost in the stocker and/or finishing phase (the system of production is cow-calf through finishing). Less emphasis should be placed on weaning weights and unit cost of production in the cow-calf phase when calves are retained rather than marketed at weaning. Of course, if high weaning weights are complementary to high performance in other phases, then this is the best of the two worlds, low unit cost of production at the cow-calf phase, high ADG, and low cost gain on the other phases. Final product marketability of the product produced must be considered to complete the systems analysis approach. A terminal exotic British cross animal has a high preference in the market place today. This is an efficient animal through all phases of production. Under the normal choice-select price spread the net margin gain from efficiency cattle will offset the lower grade and yield price of these more efficient cattle. Accounting systems design can facilitate "measuring performance of the production and marketing system." Designers of accounting systems need to question decision makers on intent to optimize generation of decision information to address these specific questions.

APPENDIX A

Accounting – Chart of Accounts for Growing and Finishing Cattle

The following are specific accounts and sub accounts that are advisable to include in the accounting system for growing and finishing cattle. Also included are the accounts for grazing and raised feed.

Assets

Investment in Growing or Finishing Livestock (Inventory Account)
- Purchased Cattle for Resale
- Raised Cattle
- Non-Cattle Cost Inventoried

Feed Inventory

Liabilities

Operating Loan
- Cattle

Accrued Interest
- Cattle

Real Estate Loans

Revenue

Livestock bought for resale
- Feeder Heifers
- Feeder Steers
- Finished Heifers
- Finished Steers

Raised Livestock

Feeder Heifers
Feeder Steers
Feeder Heifers
Finished Steers

Expenses – Cattle, Grazing, and Raised Feed

Chemical
Custom Hire
Depreciation
Feed Purchase
Feedyard (Feed and Yardage)
Fertilizer and Lime
Futures
Freight and Trucking
Gasoline, Fuel and Oil
Grazing Cost*
Hired Labor and Management (including owner labor)
Insurance
Interest
Overhead*
Property Tax
Professional Fees
Purchased Cattle for Resale
Raised Feed Production Cost*
Rent or Lease
Repairs and Maintenance
Seed
Supplies
Utilities
Veterinary or Animal Health
Pharmaceuticals
Supplies
Vet Services

* Set up as a direct cost or allocation from supporting cost centers

APPENDIX B
Cost Summary Format for Grazing, Hay , Backgrounding and Cow-Calf

Table 4. Grazing Cost Center

Units of Production* XXXXX

Grazing Cost Summary

		Total	$/Unit
	Direct Production Expenses		
	Growing		
	Chemical		
	Custom Hire		
	Depreciation		
	Fertilizer and Lime		
	Fuel, Oil & Gasoline		
	Insurance		
	Labor & Management (including owner)		
	Overhead		
	Poperty Tax		
	Rent or Lease of Land		
	Repair and Maintenance		
	Seed & Plants		
	Supplies		
A.	**Total Direct Production Expenses**		
	Indirect Expenses		
	General and Administration		
B.	**Total Indirect Expenses**		
	Finance Expense		
	Operating Interest		
	Real Estate Interest		
C.	**Total Finance Expense**		
D.	**Total Cost (A + B + C) Allocated Cost**		
E.	**Unit Cost (D/Units Allocated)***		

*Reported outside the accounting system

Table 5. Hay Production Cost Center

Hay Production Revenue and Cost Summary

	Units of Production* xxxxxx	
	Revenue	**Total**
	Sales	
A.	**Total Revenue**	
	Direct Production Expenses	
	Growing	
	Chemical	
	Custom Hire	
	Depreciation	
	Fertilizer & Lime	
	Fuel, Oil & Gasoline	
	Insurance	
	Labor & Management (including owner)	
	Repair	
	Seed & Plants	
	Supplies	
	Overhead	
B.	**Subtotal Growing**	
	Harvesting	
	Custom Hire	
	Depreciation	
	Fuel, Oil & Gasoline	
	Labor & Management (including owner)	
	Repair and Maintenance	
	Supplies	
	Overhead	
C.	Subtotal Harvesting	
D.	**Total Direct Production Expenses (B + C)**	
	Indirect Expenses	
	General and Administration	
E.	**Total Indirect Expenses**	
	Financing	
	Operating Interest	
	Real Estate Interest	
F.	**Total Financing Expense**	
G.	**Marketing Expense**	
	Freight and Trucking	
	Labor & Management (including owner)	
	Other	
H.	**Total Marketing Expense**	
I.	**Total Cost (D+E+F+H-A) Allocated Cost**	
J.	**Unit Cost (I/Units Allocated)***	

Table 6. Revenue and Cost Summary for Backgrounding Cattle

Lot Number* XXXX Head Out* XXXX Net Gain* XXXX

		Total	$/Head	$/Cwt.
	Revenue			
	Livestock Sales			
	Raised Feeder Cattle		**Out**	**Gain**
	Raised Cull Feeder			
A.	**Total Revenue**			
	Direct Production Expenses			
	Purchased Livestock for Resale			
	Weaned Steer			
	Transportation			
	Raised Livestock (Allocated Expense)			
	Weaned Steer			
B.	**Subtotal Cost of Cattle**			
	Other Direct Production Expenses			
	Animal Health			
	Depreciation			
	Custon Hire			
	Feed			
	Grazing Cost (at Allocated Cost)			
	Purchased			
	Raised Feed (at Allocated Cost)			
	Insurance			
	Labor & Management (including owner)			
	Overhead			
	Repair and Maintenance			
	Taxes			
	Utilities			
C.	**Total Direct Production Expenses**			
D.	**Production Margin (A - C)**			
	Indirect Expenses			
	General and Administration			
E.	**Total Indirect Expenses**			
F.	**Financing**			
	Interest Cost			
G.	**Total Cost of Sales (C + E + F)**			
	Marketing			
	Checkoff			
	Commissions			
	Futures/Options			
	Freight and Trucking			
	Management (including owner)			
	Other Marketing			
H.	**Total Marketing Expense**			
I.	**Total Cost of Before Tax (C+E+F+H)**			
J.	**Net Income Before Tax (A - H)**			
K.	**Cost of Gain Before Tax (I - B)/ Net Gain)***			
L.	**Unit Cost (I. / Net Payweight)***			
M.	**Marketing Margin***			
N.	**Feeding Margin***			

*Reported outside the accounting system

Table 7. Revenue and Costs For the Cow-Calf and Weaned Calf Production

	Number of Breeding Cows	xxxx	Weaned Calf Production		XXXXXX
	Revenue				
	Cash Receipts		Total	Per Cow	Per Cwt
	Raised Livestock Products				
	Copperative Distributions				
	Agricultural Program Payments				
	Miscellaneous Income				
	Other Cash Receipts				
	Non-Cash Income:				
	Non-Cash Transfers Out				
	Base Value of Qty. Trans. To Raised Repl. Stock				
	Inc. in Base Value of Qty. Trans. Into Rsd. Brding Stock				
	Gain (Loss) on Sale/Death of Breeding Stock				
	Farm/Ranch Product Consumption				
	Other Non-Cash Revenue				
A.	**Gross Revenue**				
	Cost of Sales (Undepreciated Value of Culled Breeding Stock)				
	Operating Expenses				
	Chemicals				
	Custom Hire (machine work)				
	Depreciation				
	Feed Purchase				
	Freight and Trucking				
	Gasoline, Fuel, & Oil				
	Grazing Cost (Allocated)				
	Insurance				
	Hired Labor & Management (including owner)				
	Raised Feed (Allocated)				
	Rents or Leases				
	Repairs and Maintenance				
	Supplies				
	Utilities				
	Veterinary & Breeding				
	Professional Fees				
	Other Non-Cash Operating Expenses				
B.	**Total Direct Production Expenses**				
C.	**Production Margin (A - C)**				
	Indirect Expenses				
	General and Administration				
D.	**Total Indirect Expenses**				
E.	**Financing**				
	Interest Cost				
F.	**Total Cost of Sales (C + E + F)**				
	Marketing				
	Checkoff				
	Commissions				
	Futures/Options				
	Freight and Trucking				
	Management (including owner)				
	Other Marketing				
G.	**Total Marketing Expense**				
H	**Total Cost of Before Tax (C+E+F+H)**				
I.	**Net Income Before Tax (A - H)**				

J.	**Non- Calf Revenue Adjustment***				
K.	**Unit Cost of Weaned Calf***				

---

*Reported outside the accounting system