Determining Cost of Production for Finishing Cattle

Prepared by Bill Halfman, UW Extension Agriculture Agent

Determining the cost of production for feeding cattle serves many important purposes for the farm operation. Some of the factors that are necessary to consider include:

- determining what feeders should be bought for,
- analyzing strengths and weakness of the operation,
- determining if cattle feeding fits with the farm's goals and needs,
- determine how much can be spent on capital improvements
- help producers to lock in profits using forward pricing tools

Determining an accurate cost of production can also be a challenge for many producers for a variety of reasons.

The purpose of this fact sheet is to provide an overview of typical costs associated with feeding cattle, provide options to determine reasonable values for some of the more difficult costs, including home grown feeds, yardage, and fixed or overhead expenses. Considerations for comparing your costs to other costs will also be discussed, and a list of resources for helping producers determine their cost of production will be provided.

The following table provides a list of expenses usually incurred in a cattle feeding operation:

Variable (Direct) Expenses	**Fixed (Overhead) Expenses**
Feeder price	Equipment and Machinery
Purchased feed	Buildings
Home grown feed	Real Estate and Personal taxes
Bedding	Farm Insurance
Vet and medicine	Interest
Transportation	
Marketing	
Fuel and power	

Direct Expenses
Feed costs fall into two categories, purchased and home grown. Basic records should allow assignment of purchased feed to groups of livestock. The challenge is allocating and assigning a value to home grown feeds fed to the cattle. Some basic recording of ration mixes and amounts fed will help determine the quantity of home grown feed used. Assigning a value to the feed is more challenging. Following are three different options for assigning a cost to home grown feeds:

1. Cost of production. This method uses the farm's cost to produce the feed. This is the cost of production minus the government payments for crop programs. This is not the best method for assigning a value to the crops fed to the livestock as it puts all the risk of showing a profit onto the cattle and ignores opportunity cost of the feed.
2. Opportunity Cost. This method assigns the value to the homegrown feed of what it could have been sold for and should also include a storage cost and interest charge on the amount the grain could have been sold for.
3. Cost that feed could be purchased for. This method is finding out what the feed could be purchased for most likely using a pre-booked format from an area feed mill or feed broker and using that value. It may be best to find out what the feed could be booked for in the fall when harvest time usually has prices at a seasonal low.

Methods 2 and 3 are the most fair to the livestock enterprise and place risk of profit for the feed on the crop enterprise.

When assigning expenses for hauling manure, the crop enterprise should be assigned a portion of the manure hauling expenses equivalent to the fertilizer value of the manure applied to the cropland and the remainder of the hauling bill assigned to the livestock enterprise. This method accounts only for the macro-nutrients, farms with soils lacking in micro-nutrients could use the same approach. While it is known that manure adds organic matter to soil, and organic matter is most often beneficial there is not a commonly accepted value for this benefit.

Other direct expenses like veterinary costs, ear tags, hired trucking and similar costs should be easy to track with a set of good yet straight forward records.

Yardage
Yardage is a term used to describe the following costs of feeding cattle; labor, building/ facility, water, electric, equipment and fuel for feeding, manure hauling and bedding. It may or may not include the actual bedding material cost and the cost for chute and processing use. Yardage can be a real challenge to determine. Many times the figure of 25 cents per head per day is used. There is great potential for under charging if that factor is used for the following reasons: the value is an old value and it comes from western and southern plains with mild

weather, dirt lots and a high volume of cattle per location. The climate there is arid which allows for high evaporation and leads to dry material for manure which makes for less volume and is much cheaper to haul. In reality, with current costs of inputs, yardage is more likely 35 to 50 cents or more per head per day for many producers.

A large part of yardage is the fixed or overhead costs associated with feeding cattle. This is primarily facilities and equipment. Many producers have a difficult time determining accurate values for overhead costs. This is due to a variety of reasons including the varying age of these items and determining what percentage of the costs of an item used in many enterprises to assign to each enterprise.

Overhead Expenses

Costs for buildings and equipment represent a charge for depreciation, interest on investment (also called opportunity cost), repairs, taxes, and insurance. These five expenses of capital items are often referred to as the DIRTI 5.

The purpose of assigning these charges is that assets wear out and if the business is to continue they need to be replaced. In theory if we pay cash for a capital item, we should be able to generate enough money, and put into savings, over the life of the item to purchase a replacement for the worn out asset.

The key factors to determining an annual cost for fixed costs are:

1. valuation of the asset
2. determining an annual charge for the asset, including opportunity cost
3. determining repairs, tax and insurance for that asset

The best source to determine the repair, tax and insurance costs of fixed assets is from a good set of farm records. If those are not available or a projection is being calculated for a potential new asset then the common practice is to use the following method to determine annual expenses. For repairs, use 5% of the new value of the item, for taxes and insurance use 0.5% of the new value.

Many cattle feeders in Wisconsin use “retired” dairy facilities for feeding cattle. Often times the bunk feeders and loafing sheds are used to house the cattle. It can be challenging to determine a value of those buildings which may appear to have no value. Cattle will wear buildings out over time and can lower the value of the building quicker than other potential uses.

Following are four options for determining the value of existing buildings so annual costs can be determined:

1. Alternative revenue method. This method assigns an alternative use of the building revenue as part of the annual cost. For example some buildings may be able to be rented out for hay or machinery storage and

may be able to generate from 10 cents to 40 cents or so per square foot per year. Additional repair costs should be added to that figure.

An example, assume a 40' x 60', 3 sided shed that could be rented for 30 cents per square foot. Revenue would be 2400 ft^2 x 0.30= $720 per year, and add repairs.

2. Assign a current value of ½ the cost of constructing a new building similar to the existing building. Use a capital recovery calculation to determine the annual cost. This may be a good way to assign a value to a building still in very good shape, which has been depreciated out.
3. Use the cost of improvements, remodeling and repairs to determine a current value of a building for calculating annual cost. This method may be best for an old building that was in pretty tough shape and required fair amount of work to make it suitable for cattle feeding.
4. Find the assessed value of the building from the township assessor and use that value for calculating annual cost.

To determine the annual cost for the fixed asset the following factors need to be known: current or original value, salvage value, expected lifetime, and opportunity cost or interest. If the item is being paid for with borrowed money use the interest rate of the loan, if the item was paid for with cash, then use an interest rate that the money could be earning. A capital recovery factor based off useful life and interest rate can be calculated or found in a table to determine annual cost.

The following is an example:
A building on the farm has a value of $8000 and $4000 of remodeling was done to it to make it useful for feeding cattle, for a total value of $12,000. It has an expected life of 15 years and a salvage value of $2000. The building is paid for and remodeling costs were covered from cash. The cash could earn 6% interest in a CD. To determine annual cost of the building the following calculations are done. The building will have a capacity of 40 head of steers and will be kept full all year.

Current value – salvage value= consumable portion
$12,000- $2000 = $10,000

Capital recovery factor (CRF) from the table included in this handout based on 15 years of useful life and 5% interest is 0.1030

Consumable value x CRF = annual cost
$10,000 x 0.1030= $1030

Salvage value x interest rate = opportunity cost
$2000 x 6%= $120

Annual cost + salvage opportunity cost + insurance, taxes and repairs = total opportunity cost (use actual records for repairs insurance and taxes if you have them, if you don't use 5% of original value).

$1030 + $120+ $600= $1750

The total annual cost can be divided by the animals in the building to determine a cost per animal per day.

Total annual cost / animals / days
$1750 / 40 / 365 = 12 cents per day.

The same procedure can be applied to determine machinery costs for the cattle finishing operation. One of the challenges to assigning machinery costs and fuel and utilities is correct allocation of machinery costs among several enterprises on a farm operation. Some form of user friendly record keeping system is the only way to accurately allocate machinery and fuel costs. If a farm operator is interested in doing accurate enterprise analysis, record keeping is essential.

When doing a whole farm financial analysis, breaking fuel and utilities out by enterprise is not needed. If accurate enterprise analysis is desired to examine strengths and weaknesses of an operation, particularly one that has some very large enterprises a more accurate analysis can be completed when fuel and utilities can correctly be allocated. Depending on how the farm operation purchases fuel, examining seasonal trends in fuel and utility consumption may help allocate those resources to the different farm enterprises. For example in spring and fall there will likely be increases in fuel use for planting and harvesting and if the farm is on a monthly "keep full" schedule for fuel they could determine relatively closely the fuel use for the crops from the bills.

Labor is another expense that can be difficult to assign a value to. While many times farmers say they work for nothing there should be some value placed on their time. Two options for assigning a value to the labor used for feeding cattle are; using a self determined hourly rate, based of the opportunity cost of another income for that time, or determine the amount of family living cost that the cattle feeding enterprise is expected to generate.

Benchmarking
Benchmarking is used to compare performance of the operation against other similar operations or the same operations past performance. Close out date is used for making comparisons. Benchmarking against average numbers is very risky due to the extreme range in actual cost of production out there.

For example, daily yardage was calculated for 89 farms from the University of Minnesota Center for Farm Financial Management. The average yardage value

was 32 cents per day, while the low profit group's yardage was 42 cents and the high profit group had a daily yardage of 20 cents per day. This strongly reinforces the fact that producers need to calculate their own costs rather than just use average or traditional figures.

Performance indicators and input amounts should be tracked. These include rate of gain, feed efficiency and quantities of consumable inputs. The value of these factors is that they may be used to compare performance of the operation over time to industry expected performance measure and help the operation identify strengths and weaknesses. These factors may also be used with current input costs to help determine how much feeders can be bought for and still be able to make a profit.

There are several resources listed at the end of this fact sheet for producers to find worksheets for helping determine cost of production and for finding projection budgets to use as patterns for developing their own projections and for financial analysis. A capital recovery factor chart and a sample budget follows.

Websites of interest:

http://www.uwex.edu/ces/animalscience/beef/
University of Wisconsin Animal Science Extension Beef Page, budget information can be found in the Resource Library area.

http://www.iowabeefcenter.org/default.htm
The Iowa State University Iowa Beef Center

http://www.cffm.umn.edu/
The University of Minnesota Center For Farm Financial Management

http://www.oznet.ksu.edu/swao/livestock/focusonfeedlots/
Kansas State University Focus on Feedlots

Capital Recovery Factors

Interest years	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%	16%	17%	18%	1
1	1.0400	1.0500	1.0600	1.0700	1.0800	1.0900	1.1000	1.1100	1.1200	1.1300	1.1400	1.1500	1.1600	1.1700	1.1800	1.1
2	0.5301	0.5378	0.5454	0.5530	0.5607	0.5684	0.5761	0.5839	0.5916	0.5994	0.6072	0.6151	0.6229	0.6308	0.6387	0.6
3	0.3603	0.3672	0.3741	0.3810	0.3880	0.3950	0.4021	0.4092	0.4163	0.4235	0.4307	0.4379	0.4452	0.4525	0.4599	0.4
4	0.2754	0.2820	0.2885	0.2952	0.3019	0.3086	0.3154	0.3223	0.3292	0.3361	0.3432	0.3502	0.3573	0.3645	0.3717	0.3
5	0.2246	0.2309	0.2373	0.2438	0.2504	0.2570	0.2637	0.2705	0.2774	0.2843	0.2912	0.2983	0.3054	0.3125	0.3197	0.3
6	0.1907	0.1970	0.2033	0.2097	0.2163	0.2229	0.2296	0.2363	0.2432	0.2501	0.2571	0.2642	0.2713	0.2786	0.2859	0.2
7	0.1666	0.1728	0.1791	0.1855	0.1920	0.1986	0.2054	0.2122	0.2191	0.2261	0.2331	0.2403	0.2476	0.2549	0.2623	0.2
8	0.1485	0.1547	0.1610	0.1674	0.1740	0.1806	0.1874	0.1943	0.2013	0.2083	0.2155	0.2228	0.2302	0.2376	0.2452	0.2
9	0.1344	0.1406	0.1470	0.1534	0.1600	0.1667	0.1736	0.1806	0.1876	0.1948	0.2021	0.2095	0.2170	0.2246	0.2323	0.2
10	0.1232	0.1295	0.1358	0.1423	0.1490	0.1558	0.1627	0.1698	0.1769	0.1842	0.1917	0.1992	0.2069	0.2146	0.2225	0.2
11	0.1141	0.1203	0.1267	0.1333	0.1400	0.1469	0.1539	0.1611	0.1684	0.1758	0.1833	0.1910	0.1988	0.2067	0.2147	0.2
12	0.1065	0.1128	0.1192	0.1259	0.1326	0.1396	0.1467	0.1540	0.1614	0.1689	0.1766	0.1844	0.1924	0.2004	0.2086	0.2
13	0.1001	0.1064	0.1129	0.1196	0.1265	0.1335	0.1407	0.1481	0.1556	0.1633	0.1711	0.1791	0.1871	0.1953	0.2036	0.2
14	0.0946	0.1010	0.1075	0.1143	0.1212	0.1284	0.1357	0.1432	0.1508	0.1586	0.1666	0.1746	0.1828	0.1912	0.1996	0.2
15	0.0899	0.0963	0.1029	0.1097	0.1168	0.1240	0.1314	0.1390	0.1468	0.1547	0.1628	0.1710	0.1793	0.1878	0.1964	0.2
16	0.0858	0.0922	0.0989	0.1058	0.1129	0.1203	0.1278	0.1355	0.1433	0.1514	0.1596	0.1679	0.1764	0.1850	0.1937	0.2
17	0.0821	0.0886	0.0954	0.1024	0.1096	0.1170	0.1246	0.1324	0.1404	0.1486	0.1569	0.1653	0.1739	0.1826	0.1914	0.2
18	0.0789	0.0855	0.0923	0.0994	0.1067	0.1142	0.1219	0.1298	0.1379	0.1462	0.1546	0.1631	0.1718	0.1807	0.1896	0.1
19	0.0761	0.0827	0.0896	0.0967	0.1041	0.1117	0.1195	0.1275	0.1357	0.1441	0.1526	0.1613	0.1701	0.1790	0.1881	0.1
20	0.0735	0.0802	0.0871	0.0943	0.1018	0.1095	0.1174	0.1255	0.1338	0.1423	0.1509	0.1597	0.1686	0.1776	0.1862	0.1
25	0.0640	0.0709	0.0782	0.0858	0.0936	0.1018	0.1101	0.1187	0.1275	0.1364	0.1454	0.1546	0.1640	0.1734	0.1829	0.1
30	0.0578	0.0650	0.0726	0.0805	0.0888	0.0973	0.1060	0.1150	0.1241	0.1334	0.1428	0.1523	0.1618	0.1715	0.1812	0.1
35	0.0535	0.0610	0.0689	0.0772	0.0858	0.0946	0.1036	0.1129	0.1223	0.1318	0.1414	0.1511	0.1608	0.1707	0.1805	0.1
40	0.0505	0.0505	0.0664	0.0750	0.0838	0.0929	0.1022	0.1117	0.1213	0.1309	0.1407	0.1505	0.1604	0.1703	0.1802	0.1

To determine the correct factor to use line up interest rate with number of years of useful life.

For example 8 % interest and 10 years would be factor of 0.1490 from the table above

Enterprise Budgets: Dairy Steer Calves (2/1/01, UWEX, Manitowoc, S.R. Hendrickson)

BCM 46 Dairy Steer Calves: 350 to 1,300 pounds (~11-12 months).

Assumptions: Dairy steer calves purchased at 350 lbs., feedlot fed on high grain and limited forages for 10-11 months, and sold at 1,300 lbs. at 11-12 months.

Left side of the budget is for one animal while the right side of the budget is for the number of head selected.

Economic planning budget (cash-flow) for one animal.						Cash-flow budget for your herd size.					
	Wt.	Unit	Price	Unit	Dollars	No.	Wt.	Unit	Price	Unit	Dollars
Receipts						**Receipts**					
Steers,	1300	lbs.	$65.00	$/cwt.	$845.00	100	1300	lbs.	$65.00	$/cwt	$84,500
Total receipts					$845.00						$84,500
Variable Expenses	Amt.	Unit	Price	Unit	Dollars	No.	Amt.	Unit	Price	Unit	Dollars
Cattle costs						Cattle costs					
Pay weight	350	lbs.	$90.00	$/cwt.	$315.00	100	350	lbs.	$90.00	$/cwt	$31,500.00
Purchase costs			$4.00	$/hd.	$4.00				$4.00	$/hd	$400.00
Total arrival cost					$319.00						$31,900.00
Feed expenses											
milk replacer	0	lbs.	$75.00	$/cwt.	$0.00	100	0	cwt.	$75.00	$/cwt	$0.00
calf grain starter	0	lbs.	$13.00	$/cwt.	$0.00		0	cwt.	$13.00	$/cwt	$0.00
grain (corn)	6600	lbs.	$1.75	$/bu.	$206.25		11786	bu.	$1.75	$/bu	$20,625.00
grain (oats)	0	lbs.	$1.00	$/bu.	$0.00		0	bu.	$1.00	$/bu	$0.00
protein supplement #1	330	lbs.	$314.00	$/ton	$51.81		16.5	ton	$314.00	$/ton	$5,181.00
protein supplement #2	0	lbs.	$0.00	$/ton	$0.00		0	ton	$0.00	$/ton	$0.00
hay/haylage	660	lbs.	$60.00	$/ton	$19.80		33	ton	$60.00	$/ton	$1,980.00
corn silage	0	lbs.	$18.00	$/ton	$0.00		0	ton	$18.00	$/ton	$0.00
pasture	0	acre	$65.00	$/acre	$0.00		0	acre	$65.00	$/acre	$0.00
limestone	22	lbs.	$5.00	$/cwt.	$1.10		22	cwt.	$5.00	$/cwt	$110.00
dical. phosphate	0	lbs.	$18.00	$/cwt.	$0.00		0	cwt.	$18.00	$/cwt	$0.00
t.m. salt	32	lbs.	$13.00	$/cwt.	$4.16		32	cwt.	$13.00	$/cwt	$416.00
vitamin/mineral premix	0	lbs.	$36.00	$/cwt.	$0.00		0	cwt.	$36.00	$/cwt	$0.00
milling & mixing	0	lbs.	$0.15	$/cwt.	$0.00		0	cwt.	$0.15	$/cwt	$0.00
Total feed costs					$283.12						$28,312.00