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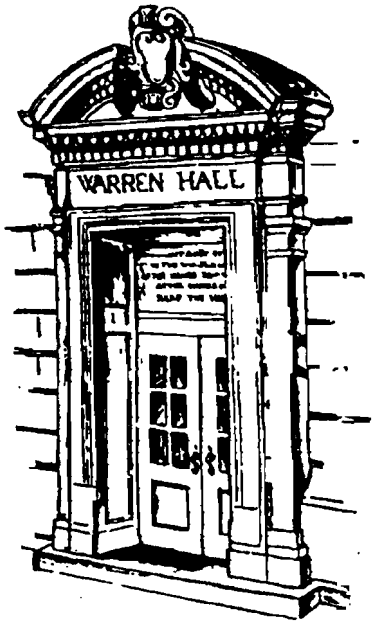

Staff Paper

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CAPITAL ASSETS

ISSUES AND RECOMMENDATIONS FOR THE FARM FINANCIAL STANDARDS TASK FORCE

Eddy L. LaDue

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CAPITAL ASSETS

Issues and Recommendations for the Farm Financial Standards Task Force[1]

Eddy L. LaDue[2]

BREEDING STOCK

The Farm Financial Standards Task Force (FFSTF) recommends that one of two basic approaches be used for the handling of raised breeding livestock on financial statements. One basic approach is full cost absorption. The second basic approach is to use a base value for animals and include the change in the quantity of breeding livestock as part of income. Within the base value approach, two methods of establishing base values are acceptable. They are: (1) quantity-based market value, and (2) base value with full revenue recognition.[3]

The full cost absorption approach is the preferred approach because of its accordance with GAAP. However, because of its record keeping burden and inconsistency with cash basis tax preparation, it is recognized that this method will continue to receive limited use. With full cost absorption, raised animals enter the income statement only through depreciation of accumulated costs and gain or loss on sale (usually write-off of unused depreciation). With the base value methods, the change in value of livestock resulting from the increased number of raised replacements and the income or loss from the sale of animals are included in income, and the costs of raising replacements are included in expenses. Changes in the value of the herd due to changes in market prices of livestock are excluded from income using all methods.

Full Cost Absorption

Balance Sheet Treatment

Full cost absorption requires that all costs of raising livestock be allocated and accumulated. These costs are then depreciated after the animal enters the breeding herd (is placed in service). The undepreciated costs represent the cost of the animals for the cost basis balance sheet. Market values of the animals are included on the market value balance sheet.

Income Statement Treatment

Raised livestock enter the income statement only through the depreciation of the accumulated costs after the animal is placed in service. Any depreciation not taken by the time the animal is sold is included in gross revenue on the income statement as part of the gain or loss on sale. The total amount depreciated is the total cost minus the salvage value of the animal.

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1 Includes recommendations agreed upon by vote of the Task Force at the November 14, 1993 annual meeting.

2 Professor of Agricultural Finance, Cornell University. This paper was prepared by Professor LaDue as Chairman of Technical Workgroup 2 with input from other committee members (Brad Brolsma, Farm Credit Leasing Services Corp., MN; Trenna Grabowski, CPA, IL; Jim McGrann, Texas A&M, TX; Stephen McWilliams, Metropolitan Agricultural Investments, IA; John Meyer, Continental Grain, IL; Jeff Plagge, First State Bank, IA; Dave Eggiman, Farmland Industries, MO) as well as other members of the Farm Financial Standards Task Force.

3 The base value ***without*** full value recognition method was listed as acceptable in the original Financial Guidelines for Agricultural Producers published by the FFSTF in 1991. However, at its November 1993 meeting, the Task Force voted to exclude this from the list of acceptable methods.

Most cash basis filers (most farmers) will not use the accumulation and depreciation of raised animals for tax purposes. For cash basis tax filers who use these data for tax purposes, care must be exercised in defining the costs to be accumulated. Complete application of full cost absorption requires that all costs, cash and noncash, fixed or variable, should be included in the accumulated costs. However, for cash basis filers, only cash costs can be deducted for tax purposes. For noncash items, such as raised feed, it is recommended that the corresponding cash cost items be allocated. For example, for the raised feed situation the cash costs for seed, fertilizer, spray, labor, etc., that correspond to the amount of feed used should be allocated, not the feed itself. Care must be exercised to insure that the total amount accumulated does not exceed the total cash expense. For example, if all fertilizer was used from inventory and none was purchased in the year allocation was being made, no fertilizer expense could be allocated to the raised breeding stock in that year.

Advantages of Full Cost Absorption

1. This is the GAAP approach.

2. The expense is forced to be recognized at the time the animal is "used up" (in service) not at the time the expense is incurred.

Disadvantages of Full Cost Absorption

1. Additional record keeping is required to accumulate costs and maintain depreciation records.

2. Tax records and financial statement records are inconsistent for most farms.

3. The youngstock (heifer) raising enterprise is not treated as a part of the farm business. No profit or loss is generated by the youngstock enterprise. Only net costs (in the form of depreciation) are reflected.

4. It assumes that raised breeding stock is "used-up" in the same way as machinery. The fact that the change in value of breeding stock is not approximated by the depreciated values is not reflected.

5. In periods of rapid inflation (i.e., the early 1980s), the effect of the increase in costs of raising replacements on net income is delayed. The true opportunity cost of the resources (replacements) being used is not reflected in net income.

Quantity-Based Market Value

Balance Sheet Treatment

Animals are entered on the balance sheet at their market value. Separate values for individual animals are acceptable. Listing animals by approximately homogeneous groups is also acceptable. Values are the current market value for the animals listed. For example, balance sheet listings might appear as shown in Tables 1 and 2.

Income Statement Treatment

Changes in the quantity of the raised breeding herd are included in the income statement as an adjustment to cash sales of breeding livestock. Changes in inventory due to price changes are included in valuation equity in the statement of owner equity.

Table 1. **Balance Sheet, December 31, 19x0**
Raised Breeding Livestock Schedule

Number	Description	Price	Market Value
20	Calves (birth to 6 months)	$ 150	$ 3,000
35	Open heifers (6 mo. to breeding)	500	17,500
25	Bred heifers	900	22,500
100	Cows	1,100	110,000
	TOTAL		$153,000

Separation of the change due to quantity from that due to price is accomplished by determining the value of the end of year (19x1) quantity of livestock at beginning of year prices. That is, determine what the end of year market value would have been if prices had not changed during the year. The difference between the actual beginning of year market value and the end of year value, calculated under the assumption that prices did not change, is the change due to quantity. The remainder of the change between beginning and end of year is due to price. This is determined by subtracting the value of the end of year quantity, valued at beginning of year prices from the actual end of year market value.

Table 2. **Balance Sheet, December 31, 19x1**
Raised Breeding Livestock Schedule

Number	Description	Price	Market Value
25	Calves (birth to 6 months)	$ 140	$ 3,500
30	Open heifers (6 mo. to breeding)	475	14,250
28	Bred heifers	925	25,900
110	Cows	1,150	126,500
	TOTAL		$170,150

An example of these calculations for the balance sheet entries in Tables 1 and 2 is illustrated in Table 3.

Table 3. **Income Statement Schedule, December 31, 19x1**
Breeding Livestock Inventory Change

(a) Description	(b) Number End of Year	(c) Price Beginning of Year	(d) End Value without Price Change (b x c)
Calves	25	150	3,750
Open heifers	30	500	15,000
Bred heifers	28	900	25,200
Cows	110	1,100	121,000
Total			164,950

End of year market value	170,150	
End of value without price change	164,950	164,950
Beginning of year market value		153,000
Change due to quantity		11,950
Change due to price	5,200	

The $11,950 is included in the income statement as an adjustment to breeding livestock sales. The total value of animals sold is also included as income. The $5,200 is included as the change in valuation equity for livestock in the statement of owner equity.

In cases where an animal or group of animals did not appear in the beginning of year inventory, a beginning of year price must be established. If the animals were raised, use the beginning of year value for animals similar to those in inventory at the end of year. For example, a new heifer raising operation may have only calves in inventory at the beginning of the year, but will have open heifers at the end of year. The beginning of year value to use for open heifers is the value of open heifers at the beginning of the year.

Although the FFSTF report did not specifically address changes in the quality of livestock, quality changes should be included with quantity changes and not allow to fall into price change effects. If the quality of animals changes, the beginning of year value to use, in calculating the value of the end of year quantity at beginning of year prices, is the beginning of year value of animals of quality similar to the quality that exists at the end of the year. For example, assume bred heifers were valued at $900 at the beginning of the year and $950 at the end of the year. If the heifers in the end of year inventory were of better quality due to better breeding and improved rearing practices (and say, were bigger), the beginning of year price to use is the value of the better animals at the beginning of the year. If animals of similar quality would have been valued at $925 at the beginning of the year, that value should be used in calculating the change in inventory due to quantity vs. price illustrated in Table 3.

Raised animals have a zero tax basis. Thus, the cost value of these animals to be used in calculating deferred taxes is zero. If a complete cost value balance sheet is not being maintained, it makes the most sense to use the zero tax basis as the cost value. In this case, the income statement should be reconciled to the market value balance sheet. Reconciliation of the income statement to the market value balance sheet will allow separation of the change in equity into change in retained earnings, contributed capital and valuation equity for the year begin analyzed. Use of the quantity-based market value approach does not allow separating the total equity in raised cattle, generated during all past years, into that due to retained earnings and that due to valuation equity. Since for most livestock the cost of raising the animal to service age is about equal to its market value, assuming that the entire equity in breeding stock is retained earnings would provide the most reasonable value. The Task Force recommends that those using quantity-based market value for breeding livestock include the entire equity in breeding livestock as retained earnings when separating historical equity (for all years prior to the current year) into valuation equity vs. retained earnings and contributed capital.

Advantages of Quantity-Based Market Value

1. No base value for raised animals, other than the market value, need to be established. The tax basis, which is needed for calculation of deferred taxes, can be carried as the cost basis. Livestock have two values – (market value and cost (tax basis) value), rather than three, (market value, cost (base) value and tax basis).

2. Records of the number of animals sold or died, and their base values, are not required.

3. Changes in the market value of the existing herd are not reflected in income. Market value only influences the valuation of increases or decreases in inventories in that they are valued at current market value.

4. Economic depreciation of animals is reflected in the income statement, rather than including an arbitrary allocation of the value of the animal over its life which occurs with depreciation schedules.

Disadvantages of Quantity-Based Market Value

1. Zero cost basis of raised animals under-represents cost based investment if ROA or other income measures are to be calculated on a cost basis.

Base Value with Full Value Recognition

Balance Sheet Treatment

1. ***Selection of Base Value.*** The base value is designed to represent the cost of raising the animals to its current status. For example, the base rate for cows would be the cost of raising heifers to freshening. The base value of a bred heifer would be the cost of raising an animal to breeding age. The value can be based on the actual or estimated cost of raising the animal to its current status, the market value of such animals, "safe harbor" values provided by IRS or other conventional practices followed by the business.

   It is expected that in most cases the base value will remain constant for a number of years. However, if the cost value of the business developed using the base value is to be maintained at a reasonable value, periodic changes will need to be made. If the group value approach (discussed below) is used, net income of the business will be influenced in the year of the change. The longer the period between changes, the greater the effect of the change on income in the year of the change. The frequency and magnitude of changes should consider the trade-off between the effect on net income and the desire for a constant value.

2. There are two approaches to maintaining base values. One, which we will refer to as the "individual animal approach", maintains a value for each animal. The second, which we will refer to as the "group value approach", maintains base values for each breeding animal group but makes no attempt to keep track of individual animals.

   a. ***Individual Animal Approach.*** Under the individual animal approach, a base value is established for each animal at the time it enters a group. Base values for an individual animal are changed only when an animal enters a new group. For example, assume the base value assigned calves is $240, one to two year old heifers is $625, heifers over two years old is $950, and cows is $1,000. A calf is assigned a base value of $240 when it is born, when it reaches one year of age, the base value is raised to $625, when it reaches two years of age, the base is raised to $950, when it freshens, the base value is raised to $1,000. It maintains that $1,000 basis until it is sold. It would not be unusual for individual cows in a herd to have different base values at any one point in time.

      When base values change, the new values are used only for animals that move into a new group. For example, if base values changed to $250, $650, $1,000, and $1,050, respectively, at the time the animal listed above was a two year old, but before freshening, it would be assigned the new base value for cows ($1,050) when it freshened. If the change occurred after the animal freshened, its base value would not change from the $1,000 value. If the base value of an animal is changed, the change must be counted as income (or loss).

      The individual animal data are summarized by the groups that are desired for the balance sheet, frequently by groups that would be assigned the same market value (as shown in Table 4). If market values are also maintained for each animal, the values for all breeding animals could be totaled directly from the base value record and entered directly on the balance sheet (schedules like those shown in Table 4 could be omitted).

Table 4. **Balance Sheet, December 31, 19x0**
Raised Breeding Stock

		Market Value		Existing Cost Value		New Cow Value[a]	
No.	Description	Price	Total	Value	Total	Value	Total
40	Calves <1 year	$250	$ 10,000	$ 240	$ 9,600	$	$
38	Heifers 1-2 years	600	22,800	625	23,750		
5	Heifers >2 years	1,000	5,000	950	4,750		
100	Cows	1,100	110,000	1,000	100,000		
	Total		$147,800		$138,100		

[a] Complete only in years when base values change.

The main disadvantage with this approach is the large amount of record keeping required to maintain data on individual animals. The record keeping can be limited considerably by handling all animals born in one year (or other period) as a group and using a first in, first out procedure for assigning deaths, sales, and moves into the next group.

This procedure has the advantage that base values can be changed frequently without requiring any calculation of the effect of the change on net income. The change in base value is reflected as animals move into new groups. The effect on net income is gradual and occurs automatically. No calculation of the effect of the change in base value need to be made when base values are changed. Raised breeding livestock schedules like those shown in Tables 4 and 5 could be used, but the columns for the new cost value would be omitted.

Table 5. **Balance Sheet, December 31, 19x1**
Raised Breeding Stock

		Market Value		Existing Cost Value		New Cow Value[a]	
No.	Description	Price	Total	Value	Total	Value	Total
44	Calves <1 year	$ 250	$ 10,000	$ 240	$ 9,600	$	$
39	Heifers 1-2 years	600	22,800	625	23,750		
6	Heifers >2 years	1,000	5,000	950	4,750		
110	Cows	1,100	110,000	1,000	100,000		
	Total		$147,800		$138,100		

[a] Complete only in years when base values change.

b. ***Group Value Approach.*** Under the group value approach, breeding animals in the herd are assigned base values at the time the balance sheet is prepared. No attempt is made to follow individual animals. The income effect of a change in base value is included in net income.

(i) ***Age Groupings.*** Effective use of the group base value method requires that the number of animals that move from one breeding animal group to the next be identified. One of the easiest ways to accomplish this for

youngstock is to have the age groupings of animals represent equal portions of a year. For example, a dairy herd could be divided into six month age groups such as:

Calves	under six months
Open heifers	six months to one year
Heifers	one year to 18 months
Heifers	18 months to two years
Bred heifers	over two years
Cows	

A simpler approach, but one for which it may be more difficult to establish values, would involve annual groupings:

Calves	under one year
Heifers	one to two years
Old bred heifers	over two years
Cows	

For a beef herd, this might be simplified to:

Replacement stock	under one year
Breeding stock	one to two years
Cows	

If the groupings used are not equal portions of a year, accurate records of the number of animals moving into and out of each group during the year are required.

(ii) ***Example Entries.*** Entries are made for both market and base values. For example, see Tables 4 and 5. In most cases, entries will need to be made only for one (the existing) base. In any year when the base values are changed, the animals will need to be valued at both the existing base value and the new base value. In our example, it was decided that base values needed to be changed in 19x2 (Table 6).

Table 6. **Balance Sheet, December 31, 19x2**
Raised Breeding Stock

		Market Value		Existing Cost Value		New Cow Value[a]	
No.	**Description**	**Price**	**Total**	**Value**	**Total**	**Value**	**Total**
48	Calves <1 year	$ 275	$ 13,200	$ 240	$ 11,520	$ 260	$ 12,480
42	Heifers 1-2 years	650	27,300	625	26,250	650	27,300
7	Heifers >2 years	1,000	7,000	950	6,650	1,000	7,000
115	Cows	1,150	132,250	1,000	115,000	1,100	126,500
	Total		$179,750		$159,420		$173,280

[a] Complete only in years when base values change.

Income Statement Treatment

1. ***Raised Replacement Revenue.*** With the base value approach, the gross revenue from raising replacements is explicitly recognized. This revenue is calculated by determining the number of animals that entered the breeding inventory or moved to an older, higher value, age grouping and valuing that change.

If the individual animal approach is used, determining the raised replacement revenue involves adding up the increases in base value that have been assigned to individual animals.

With this group value approach, having age groups that are equal portions of a year makes determination of raised replacement revenue easier. The number of animals transferred to the next higher level is the number of hand at the beginning of the year minus the number sold and the number that died. In our example, for the 19x1 income statement, the number of calves in the beginning of year inventory was 40. One of those animals died, leaving 39 to be transferred to the one to two year age group at the end of year (see Table 7). This can be checked by comparing the number of animals transferred to the end of year number of animals in the one to two year group. Heifers in the one to two year group at the beginning of year may be in the >2 year group or in the cow group. Since these groups have different values, they must be separated. The number that went into the >2 year group can be determined from the end of year inventory. The remainder that were not sold or did not die must become cows. The number of calves that were raised is taken from the end of year inventory. Since these animals were not in the beginning of year inventory, their entire value represents product produced this year. The number of animals multiplied by their base value is part of the raised replacement revenue.

Table 7. Raised Replacement Revenue

Description	Number of Animals				Base Value Difference[a]	Raised Replacement Revenue
	Beginning of Year	Sold	Died	Transferred		
Calves <1 year	40		1	39	$385	$15,015
Heifers 1 to 2 years	38	1		37		
To >2 years				6	325	1,950
To cows				31	375	11,625
Heifers >2 years	5			5	50	250
End of year number of calves <1 year				44	240	10,560
Total						$39,400

[a] Difference between the base value of beginning of year group and the end of year group into which the animal was transferred. Existing, not new, cost values are used in these calculations.

2. ***Base Value Change.*** If the group value approach is used for record keeping and the base value is changed as of the balance sheet date, the gain or loss connected with that change is included in the income statement. In our example, the base value was changed in 19x2. The total base value of the raised herd was $159,420 at the existing (old) base value (Table 6). At the new base value, the value of the breeding herd is $173,280. The difference of $13,860 is included on the 19x2 income statement as is the gain or loss from the sale of raised animals. Since this is not an occurrence that is expected to happen every year, this income is not included in the revenue section of net income and, thus, is not part of net income from farm operations. It is, however, part of net income.

Adjusting net income for differences in the base value insures that the current base value of animals has been counted as income at all times. That is, in our example, the base value of all cows is $1,100 after 19x2, and that base value has been counted as income. All cows sold at any time have had their current base value counted as income through raised replacement revenue.

3. ***Gain or Loss on Sale.*** The base value of each raised animal in the breeding herd has been counted as revenue at the time it was raised. To count the entire sale value as income would be double counting. The income from sale is the difference between the value received and the base value of the animal at the time of the sale. If the individual animal approach is used, the base value of animals sold is summed from the individual records. If the group value approach is used, the base value of animals sold or died can be calculated using a procedure like that shown in Table 8. For our example, the base value of animals sold or died is $26,865.

Table 8. Base Value of Raised Breeding Livestock Sold or Died

	Number of Animals				
Beginning of Year Description	**Sold**	**Died**	**Total**	**Beginning of Year Base Value**	**Base Value of Animals Sold**
Calves <1 year		1	1	$240	$ 240
Heifers 1 to 2 years	1		1	625	625
Heifers >2 years				950	0
Cows	24	2	26	1,000	26,000
Total					$26,865

The gain or loss on the sale of raised replacements is determined by subtracting the base value of raised animals sold from the sales of raised breeding livestock. Four our example, the gain or loss would be:

Raised breeding livestock sold	$ 12,500
Base value of raised breeding livestock sold or died	(-) 26,865
Gain (or loss) on sale of raised breeding livestock	$(14,365)

With this method, raised replacement revenue and gain or loss on the sale of raised breeding livestock are included in gross income. Since the gain or loss from a change in the base value should occur, at most, every few years, it should be excluded from gross revenue and be included with the gain or loss on other assets in calculating net income from net income from operations.

Advantages of Base Value with Full Value Recognition Approach

1. A cost value is provided for raised livestock that is similar to the cost of other assets. This allows calculation of rates of return on a cost basis that are more accurate than is accomplished by using only the tax basis of livestock as the cost basis.

2. Farm income from operations is not influenced by changes in market values of assets for which a base value is established.

3. Sale of cull breeding stock are treated as a normal ongoing part of the business. Since most of the economic depreciation of livestock occurs at (just before) sale time, this procedure forces the loss (or gain) attendant with sale into the normal profitability

calculations for the business. This is likely most important for dairy operations where the sale value is normally at least $400 to $600 below the base value and the implied depreciation is a significant cost. It would be of less importance for beef operations where the base value and the cull values are less divergent.

Disadvantages of the Base Value with Full Revenue Recognition Approach

1. Net income is influenced by changes in the base value. Since such changes are usually kept to a minimum, the income or loss resulting from a base value change will represent a significant adjustment to net income in the year of the change. Part of this adjustment likely should be attributed to past year's net income. For example, if inflation causes gradual but uneven increases in the cost of raising a replacement, a true reflection of costs would require frequent, possibly annual, changes in base values.

2. The calculated cost basis of the livestock is not exactly comparable to the costs of other assets. The cost calculated for the livestock represents a before tax value. The costs are not accumulated and then depreciated. These costs have been used as deductions for tax purposes, while the cost investment in other assets is with after tax funds.

3. Base values must be established.

4. Since base values are somewhat arbitrarily assigned, excessively conservative or high values can be selected. An extremely conservative value will understate raised replacement income and understate the cost value balance sheet resulting in misstated cost based ratios (i.e., misstated cost value ROA's). A high value will result in overstatement of raised replacement income and overstate the cost value balance sheet resulting in misstated cost based ratios (i.e., lower cost value ROA's).

Alternatives to Basic Base Value with Full Value Recognition Approach

Alternate 1: Only One Transfer Point

One alternate approach for handling raised breeding livestock involves including all youngstock with the market livestock until they are transferring into the breeding herd. For example, all beef or dairy youngstock would be listed with the market animals until an animal freshens or is used for breeding service. A base value is used only for the breeding herd. In our example, on the cows would have a base value. Since young breeding stock would be valued at market value on the balance sheet, part of the revenue from raising replacements is reflected through that change in market value. the difference between the base value of animals at the time they enter the breeding herd and their value on the preceding balance represents revenue for this year. This revenue is reflected by including both the transfer value of the breeding animals and the change in the value of market livestock in revenue. For example, an animal valued at $600 in the beginning of year inventory with a base value of $1,000 will have a raised replacement income of $1,000 and a decrease in inventory of market livestock of $600 resulting in a net revenue of $400, which is the increase in the value of the animal.

Since there is only one class of breeding stock, the change in the cost value of the breeding stock represents the net effect of transfers to breeding livestock and sales of breeding livestock. For example, a herd with a base value of $1,000 per animal, 100 animals at the beginning of the year and 110 at the end of the year, has a change in cost value of breeding livestock of $10,000. This could result from transfer of 30 animals and sale of 20 animals. Thus, the value of transferred animals minus the change in cost inventory gives the base value of raised animals sold. For our example:

Transfer value of breeding livestock	$ 30,000
(-) Change in cost value inventory	(-) 10,000
(=) Base value of raised animals sold	$20,000

The value is then subtracted from the value of raised breeding stock sold to determine the gain or loss on the sale of raised breeding livestock

Raised breeding livestock sold	$12,500
Base value of raised breeding livestock sold	(-) 20,000
Gain (or loss) on sale of breeding livestock	$(7,500)

This procedure has the advantage that: (1) only one base value must be established, (2) herds where a significant proportion of the youngstock are sold (primarily meat animals), do not have to separate breeding animals from market livestock until they enter the breeding herd, and (3) it is simpler to apply.

This procedure has the disadvantage that no separation of the animals being held for breeding, or actually bred, may appear on the balance sheet. This might cover up changes in management practices that would be important to a lender or other financial analyst. Separate identification of these values could, of course, be maintained. Also, all changes in the market prices of breeding youngstock are included in revenue. Only changes in the prices of the breeding herd (cows in our example) would be excluded from net income.

Alternate 2: Quantity-Based Base Value

Another alternate approach is to establish base values for each class of animal and count the change in inventory of base values and gross cash sales of breeding livestock as income. The base value of animals is included on the cost value balance sheet. The procedures used with this system are exactly like the quantity-based market value except that the change in inventory used in determining net income is calculated using base vales instead of market values of animals. In years in which the vase value is not altered, the change in the total base value of all animals (cost value of raised breeding stock) from beginning to end of year is the change in inventory included in net income. In years in which the base value changes, a quantity-based change in inventory calculation using procedures similar to those shown in Table 3, but using the base value of animals, must be used.

This procedure has all the advantages and disadvantages of the other base value procedures except that it is much simpler than the other base value approaches. No record of the number of animals sold or died are required. No calculation of raised replacement revenue, or gain or loss on sale of animals, is needed.

Purchased Breeding Livestock

Purchased breeding livestock are handled like other purchased capital assets. The cost value on the balance sheet is the cost of the item minus the accumulated depreciation that has been taken (frequently called the undepreciated balance or remaining basis). The market value is established in the same manner as used for raised replacements and included in the market value column.

On the income statement, annual depreciation of the purchased breeding livestock is included as an expense, along with the depreciation of other capital assets such as machinery and real estate. The purchase price of the livestock is excluded. Gain or loss on the sale of purchased breeding livestock is calculated as the sale price minus the undepreciated balance at the time of sale. This gain or loss is included in the gross revenue section of the income statement.

The gain or loss on the sale of purchased breeding livestock is included in gross income to recognize the fact that the culling of breeding livestock is a normal ongoing part of the business. The sale of cull animals is a normal and planned part of the income of the business. On many businesses, the gain or loss will be a significant determinant of the net returns of the business. It differs from the gain or loss on real estate because the sale of real estate is an infrequent activity that is not normally considered a part of the operation of the business.

CAPITAL LEASES

Capital vs. Operating Leases

For financial statement purposes, leases can be divided into two categories: capital leases and operating leases. Operating leases are also called rental arrangements. Operating leases usually have periods much shorter than the life of the asset being leased. For example, a tractor for a month, land for a year, or a backhoe for three days. Operating leases are not entered on the balance sheet as assets or liabilities. Operating leases should appear as a not to the balance sheet to disclose the annual amount of minimum rental payments for which the producer is obligated, the general terms of the lease, and any other relevant information. For example, a three year lease on land might appear as a note indicating the amount of land leased, the duration of the lease and the annual lease payments.

A capital lease is a direct substitute for purchase of the asset with borrowed money. It is a noncancelable contract to make a series of payments in return for use of an asset for a specified period of time. It transfers substantially all the benefits and risks inherent in the ownership of the property to the lessee. For example, if the asset transfers to the farmer at the end of the lease or the farmer can buy the asset at the end of the lease for a bargain price, the asset is effectively being purchased and the farmer has the most of the benefits and risks of ownership of the asset.

Generally Accepted Accounting Principles (GAAP) include four test criteria that can be applied to determine if a lease is a capital lease. According to GAAP, a lease is a capital lease if it meets any one of the following criteria:

1. At the end of the lease term, the farmer owns the asset.

2. The farmer can purchase the asset for a bargain price at the end of the lease.

3. The term of the lease is at least 75 percent of the expected economic life of the asset.

4. The present value of the minimum lease payments at the inception of the lease equals or exceeds 90 percent of the market value of the leased property.

Any lease that meets any one of these criteria is a capital lease and should be entered on the balance sheet in a manner similar to a loan (as described below). Simply indicating the lease in the balance sheet notes is insufficient.

Accounting for Capital Leases - Using GAAP Procedures

The FFSTF recommends that reporting of capital leases follow GAAP procedures. Under GAAP, the lease payments are capitalized and amortized over the term of the lease, rather than expensed during each lease period for financial statement purposes. Basically, this involves handling the lease like a purchase and a loan.

Basic Procedure - Annual Payments

The basic procedure involves determining the capitalized value of the lease, depreciating that value over the life of the lease to determine asset values and amortizing that value over the life of the lease to determine liability values.

1. ***The Interest Rate.*** The first step is to establish the initial value of the lease. This value is the present value of the payments to be made over the life of the lease. Present value is determined by discontinuing at: (1) the farmer's incremental borrowing rate, or (2) the implicit rate on the lease.

The implicit rate is the actual rate charged by the lessor. It is the APR on the funds invested in the asset by the lessor. The contract rate on the lease may be the implicit rate if the payments are calculated using interest on the unpaid balance method, giving recognition to the actual timing of payments and the residual value. Often the contract rate is little more than the rate that will be used in some way to calculate payments. Since the implicit rate on the lease is frequently not known by the farmer, the incremental borrowing rate or weighted average cost of capital will normally be used.

The incremental borrowing rate is the rate the farmer would have to pay to borrow a similar amount for a similar term, at the time the lease was initiated. The weighted average cost of debt capital is the average rate the farmer is paying on borrowed funds at the time the lease is initiated.

2. ***Initial Lease Value.*** The initial lease value is the present value of all payments to be made on the lease, including down payments and advance payments. The present value can be calculated using present value tables or equations. Since most leases have an advance payment due at initiation of the lease, the correct present value equation or table is a present value of an annuity due. The equations built into many calculators are for regular present value calculations where the first payment is one period (year or month) after initiation of the contract (lease). To use such regular present value procedures, calculate the present value of all nonadvance payments using the equation or table, then add the advance payment(s) to the result.

For example, a lease with five annual payments of $11,990.80 with the first payment in advance, and an interest rate of 10 percent, has a present value using a present value of annuity due of:

$$\$11{,}990.80 \times 1 + \frac{1-(1+.10)^{-4}}{.10}$$

$11,990.80 x 4.16987 = $50,000 = present value of lease.

Alternately, using ordinary present value, the calculations would be:

$$\$11{,}990.80 \times \frac{1-(1+.10)^{-4}}{.10}$$

$11,990.80 x 3.16987 = $38,009 = present value of next four payments.

$38,009 + 11,991 = $50,000 = present value of lease.

In each case, the coefficients (4.16987 and 3.16987) could be taken from present value tables and the equations skipped. The ordinary present value procedure has an advantage for cases where more than one regular payment, or a down payment, is required at initiation of the lease, which is often the case with monthly payment leases.

3. ***Asset Value.*** The present value of all lease payments is the initial value (capitalized value) used for determining both the asset and the liability entries. This value is depreciated over the life of the lease to provide asset entries. It is amortized over the life of the lease to determine liability entries.

The asset value is calculated using any depreciation method that is consistent with the methods used on similar owned assets. While many methods could be used, it is recommended that straight-line depreciation be used. Straight-line is easier to understand and calculate than other methods, it often conforms roughly to the use of the asset and the method selected does not influence tax depreciation. A half-year or monthly convention can be used if deemed appropriate.

For our example, under the assumptions that the item was leased on April 1st and that the monthly convention is appropriate, the depreciation calculations would be:

19x1	$50,000/5 * 9/12	=	$ 7,500
19x2 - 19x5	50,000/5	=	10,000
19x6	50,000/5 * 3/12	=	2,500

The asset values to use on the balance sheet are illustrated in Table 1. The asset value determined in this manner is the market value and the cost value of the lease. The market value and the cost value of a lease should always be the same. It should be remembered that it is the lese that is being put on the balance sheet, not the asset being leased. The market value of the asset being leased should not be entered on the balance sheet as the market value of the lease. The asset being leased does not appear on the balance sheet until the purchase option is exercised at the end of the lease period.

Table 1. **Balance Sheet Values**

Balance Sheet Data	Asset Value
12/31/x1	$42,500
12/31/x2	32,500
12/31/x3	22,500
12/31/x4	12,500
12/31/x5	2,500

4. ***Liability Values.*** The liability values are determined by amortizing the initial value of the lease over the life of the lease. It is suggested that the effective interest method be used. That is the interest rate used in the amortization calculations is the same as that used to determine the present value of the payments. If the same rate is used, principal and interest payments obtained by amortization will equal the actual lease payments made. The principal remaining at any point in time is the value of the liability connected with the lease.

For our example, amortizing the $50,000 at 10 percent results in Table 2.

The ending balance for each year indicates the liability connected with the lease. However, since the liability has to be divided into that due within the next 12 months and that due beyond 12

months, the values for the balance sheet are taken from the values listed for the following year. So, at the end of year 19x1, the liability connected with the lease is $38,009. This is entered on the balance sheet as a noncurrent tractor lease liability of $29,819 (from 19x2 values) and a current portion of the tractor lease of $8,190 (from principal portion to be paid in 19x2).

Table 2. **Amortization of Lease**
$50,000 Lease, 10 Percent Interest, Five Years

Year	Beginning Balance	Total Payments	Interest Portion	Principal Portion	Ending Balance
19x1	50,000	11,991	0	11,991	38,009
19x2	38,009	11,991	3,800.92	8,190	29,819
19x3	29,819	11,991	2,981.93	9,009	20,810
19x4	20,810	11,991	2,081.05	9,910	10,901
19x5	10,901	11,991	1,090.07	10,901	0

Accrued interest on the lease must also be listed as a current liability. The accrued interest is interest on the entire liability at the rate used in amortization. For our example, the accrued interest is:

$38,009 x .10 x 9/12 = $2,851

5. ***Income Statement Values.*** The income statement values are taken from the balance sheet values and calculations. The depreciation calculated to determine the asset value of the lease is included in depreciation. The interest portion of the lease payment from the amortization table is included in the interest. The accrued interest is included in the change in accrued interest calculated from the balance sheet entries. The cash lease payment is excluded from expenses on the income statement.

For our example, the income statement values for 19x1 would be:

Depreciation expense	$7,500
Interest expense (cash portion)	0
Interest expense (accrual adjustment)	2,851

Once the depreciation and amortization calculations are made, they should be kept with the balance sheet. If they are not, they will have to be recalculated, at least down to the year for which the balance sheet is being prepared, each time a set of financial statements are developed.

Since most farmers are cash basis tax filers, this procedure results in a different expense being attributed to lease for the income statement than is used for income tax purposes (Table 3).

Monthly Payments

Those types of farms where income is received throughout the year (dairy, poultry, swine) usually repay debt and leases with monthly payments. Calculation of the value of the lease is the same as for annual leases. If the equations (calculators) are used, the number of payments is the number of months and the interest rate is the annual rate divided by 12.

For our example, if payments were monthly, and we used ordinary present value procedures, the calculations would be:

$$\$1{,}053.58 \times \frac{1-(1+.10/12)^{-59}}{.10/12}$$

$1,053.58 x 46.4576 = $48,946.80 = present value of next 59 payments.

$48,946.80 + 1,053.58 = $50,000 = present value of lease.

Table 3. Comparison of Income Statement and Tax Values

	Income Statement Values				
Year	Depreciation	Interest (Cash)	Interest (Accrual Adjustment)	Total	Tax Purposes*
19x1	$ 7,500	$0	$2,851	$10,350	$11,991
19x2	10,000	3,802	-615	13,186	11,991
19x3	10,000	2,982	-675	12,307	11,991
19x4	10,000	2,081	-743	11,338	11,991
19x5	10,000	1,090	-818	10,272	11,991
19x6	2,500	0	0	2,500	0
Total	$50,000	$9,954	$0	$59,953	$59,955

The **asset values** and depreciation calculations would be the same for monthly payments as for annual payments.

The value of the outstanding liability may, however, be considerably different with monthly payments. The main factor causing this difference is the magnitude of the payments made in the first year. As illustrated in Table 4 using annual payment calculations for a monthly lease could result in considerable error.

Table 4. End of Year Liability Value
$50,000 Lease, 10 Percent Interest

		Monthly Payments with First Payment on		
Year	Annual Payments	January 1	July 1	December 1
19x1	$38,009	$41,450	$45,664	$48,946
19x2	29,819	32,651	37,206	40,833
19x3	20,810	22,832	27,864	31,870
19x4	10,901	11,984	17,543	21,968
19x5	0	0	6,141	11,030

Preparing an amortization table for a monthly lease, like that shown in Table 2 for an annual lease, is possible with a financial calculator (such as an HP-12C), but is most feasible only with a computer. Part of such a table is shown in Table 5. If such a table is constructed, the end of year values can be taken from the monthly value that corresponds to final month of the year. For example, if the lease were initiated on April 1, the 12/31/x1 value would be $43,628 (the 9th payment would be made in December).

The interest payment on the lease is most easily determined by subtracting the change in the value of the total liability from the total lease payments. For our example, this value for 19x1 would be:

Interest paid = ($1,053.58 x 9) - ($50,000 - $43,628)
= $9,482 - $6,372
= $3,110

Table 5. Monthly Amortization of a Five Year Lease
$50,000 Lease, 10 Percent Interest, 60 Months

Month	Beginning Balance	Total Payments	Interest Portion	Principal Portion	Ending Balance
1	$50,000	$1,054	$ 0	$1,054	$48,946
2	48,946	1,054	408	646	48,301
3	48,301	1,054	403	651	47,650
4	47,650	1,054	397	657	46,993
5	46,993	1,054	392	662	46,331
6	46,331	1,054	386	667	45,664
7	45,664	1,054	381	673	44,991
8	44,991	1,054	375	679	44,312
9	44,312	1,054	369	684	43,628
10	43,628	1,054	364	690	42,938
11	42,938	1,054	358	696	42,242
12	42,242	1,054	352	702	41,540
13	41,540	1,054	346	707	40,833
.	.	.	.	.	.
.	.	.	.	.	.
.	.	.	.	.	.
58	3,108	1,054	26	1,028	2,081
59	2,081	1,054	17	1,036	1,044
60	1,044	1,053	9	1,044	0

Accrued interest on monthly leases will normally be a rather insignificant amount and, thus, will be immaterial to the balance sheet. For this reason, if the lease is for less than $100,000 or makes up less than 20 percent of the value of the farm assets, accrued interest may be ignored without significant misstatement of financial condition.

Using the accounting procedures described above, use of a lease will usually have some effect on owner equity (for example see Table 6). That is, the asset connected with the lease will be different than the liability. The amount of equity effect will depend on the depreciation method used, and the date during the year on which the lease is initiated. The lease may either increase or decrease owner equity.

Alternate 1

In light of the paperwork burden implied by the above described procedure, particularly for monthly payment leases, the Task Force allows alternate procedures that produce materially similar results. One approach is to bypass the amortization table and calculate the value of the lease liability at any point in time as the present value of the remaining payments. This procedure provides equivalent answers and is simpler for the completion of any year's balance sheet. Only the amount and number of payments remaining and the interest rate are needed. Only one year's calculations need be made at one time. This is particularly important for long term leases that have been in effect for a few years and are being placed on the balance sheet for the first time.

Table 6. **Effect of Lease on Owner Equity**
Annual Payment Lease Initiated April 1

End of Year	Gross Asset Value	Net Lease Liability	Owner Equity (Difference)	Accrued Interest	Owner Equity (Total)
19x1	$42,500	$38,009	4,491	$2,851	$1,640
19x2	32,500	29,819	2,681	2,236	445
19x3	22,500	20,810	1,690	1,561	129
19x4	12,500	10,901	1,599	818	781
19x5	2,500	0	2,500	0	2,500

For our example with monthly payments, at the end of 19x1 there are 51 payments remaining. The present value of these payments is:

$$\$1{,}053.58 \times \frac{1-(1+.10/12)^{-51}}{.10/12} = \$1{,}053.58 \times 41.4093 = \$43{,}628$$

At the end of 19x2 there will be 39 payments remaining. The present value of these payments is:

$$\$1{,}053.58 \times \frac{1-(1+.10/12)^{-39}}{.10/12} = \$1{,}053.58 \times 33.1799 = \$34{,}958$$

The current portion of the lease liability is:

$$\$43{,}628 - 34{,}958 = \$8{,}670$$

The interest paid is the total payments made minus the change in the value of the lease during the year (which, after the first year, equals the beginning of year principal due within the next 12 months). For our case, the change in the value of the lease is $6,372 for 19x1, and $8,670 for 19x2. Since total payments are $9,482 in 19x1, and $12,643 in 19x2, the interest paid is $3,110 (9,482 - 6,372) for 19x1, and $3,965 (12,643 - 8,670) for 19x2.

This procedure puts considerable focus on present value. Many calculators and computers have the present value functions built in to make calculations reasonably easy. Tables of present values are available in many finance or accounting textbooks and other sources.[4] However, if use of these procedures is inconvenient, graphs such as those shown in Figures 1 and 2 can be used. Use of these graphs will give approximate results. With care in their use, the error should be small.

For our monthly payment example, at the end of 19x2 there are 39 payments left. Using the 10 percent interest line on the graph, we get a present value factor of about 33. This gives a present value of $34,768 (1,053.58 x 33). This is reasonably close to the actual value of $34,958. At the end of 19x1 there were 51 payments left. Their present value from the graph would be $43,197 ($1,053.58 x 41).

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[4] For example, LaDue. E.L. "Present Value, Future Value and Amortization, Formulas and Tables." Department of Agricultural Economics, Cornell University A.E. Ext. 90-17.

Figure 1.
Present Value of $1 with Annual Payments

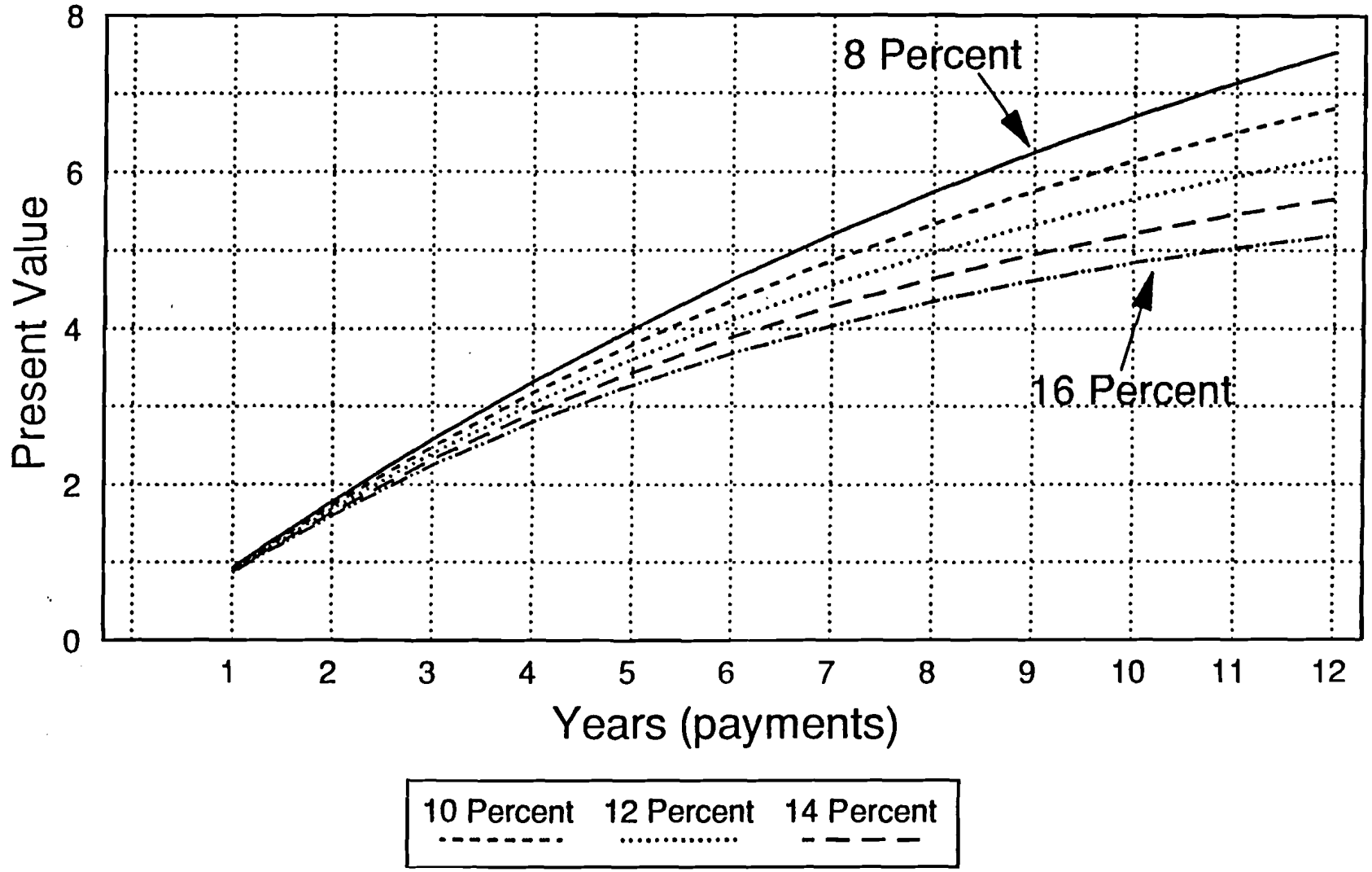
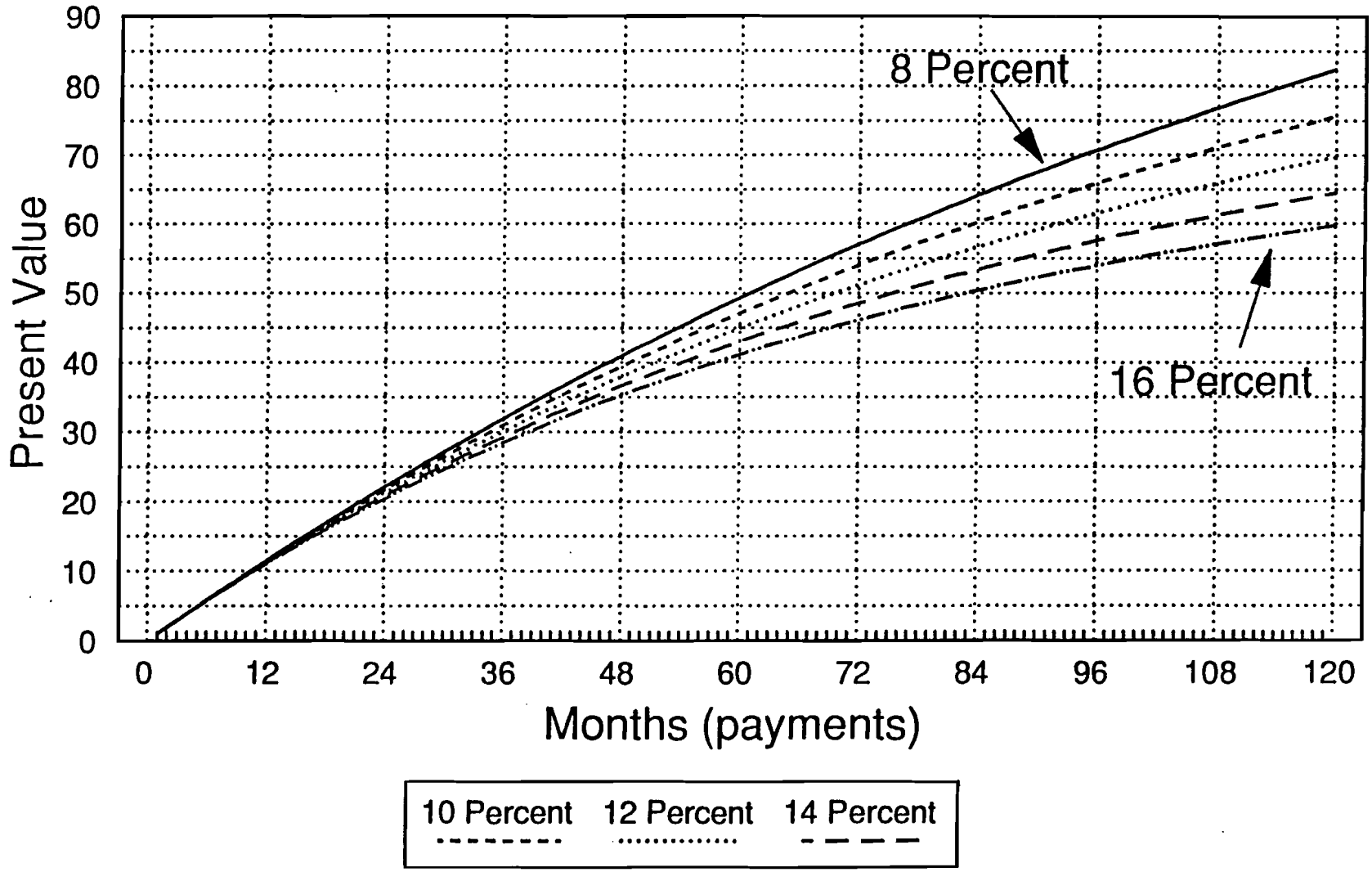


Figure 2.
Present Value of $1 with Monthly Payments



This alternate procedure only changes the method of obtaining the liability values. The asset and depreciation values are determined in the same manner as illustrated in Table 1 and its accompanying discussion.

Advantages of Alternate 1

1. Easier to employ, particularly when the lease is being entered on a balance sheet for the first time in a year after the first year or the preparer does not have the original calculations.

Disadvantages of Alternate 1

1. Entries may include rounding errors if present values are taken from graphs like Figures 1 and 2.

Alternate 2

Alternate 2 (asset = liability method) uses the same procedures for calculating the liability and interest paid as alternate 1. The difference is that the asset value is determined without calculating the depreciation schedule. Instead, the asset value is set to be equal to the total liability. For our monthly payment example, using the graphs, the asset value at the end of 19x1 would be $43,197, and at the end of 19x2 the value would be $34,768.

The depreciation is the difference between the end of year values. Thus, 19x1 depreciation would be $6,803 ($50,000 - 43,197) and 19x2 depreciation would be $8,429 ($43,197 - 34,768). Using this procedure makes the depreciation equal to the principal portion of the lease payments (i.e., the principal due within the next 12 months on the beginning of year balance sheet, after the first year).

This alternate procedure for determining the asset values is extremely easy to employ after the liability values have bene calculated. It does, however, change the pattern of depreciation over the life of the asset. As illustrated in Tables 7 and 8, this procedure puts more of the depreciation later in the life of the asset, particularly for the longer term leases. However, since a wide variety of depreciation methods, and corresponding depreciation patterns, are allowed, this pattern may be acceptable for many situations.

Table 7. Alternate Depreciation Patterns[a]
Five Year Lease, 10 Percent Interest, April 1

		Asset Equals Liability Method	
Year	Straight-Line Depreciation	Annual Payments	Monthly Payments
19x1	$7,500	$11,991	$6,372
19x2	10,000	8,190	8,670
19x3	10,000	9,009	9,579
19x4	10,000	9,910	10,581
19x5	10,000	10,900	11,690
19x6	2,500	0	3,108

[a] Using present value equations for determining amortization values.

Table 8. Alternate Depreciation Patterns[a]
12 Year Lease, 10 Percent Interest, April 1

		Asset Equals Liability Method	
Year	Straight-Line Depreciation	Annual Payments	Monthly Payments
19x1	$3,125	$6,671	$2,083
19x2	4,167	2,338	2,428
19x3	4,167	2,572	2,684
19x4	4,167	2,829	2,964
19x5	4,167	3,112	3,275
19x6	4,167	3,423	3,617
19x7	4,167	3,766	3,996
19x8	4,167	4,142	4,315
19x9	4,167	4,556	4,877
19z0	4,167	5,012	5,388
19z1	4,167	5,513	5,952
19z2	4,167	6,065	6,575
19z3	1,041	0	1,168

[a] Using present value equations for determining amortization values.

Advantages of Alternate 2

1. The lease has no effect on owner equity except the accrued interest effect. The lease asset and lease liability are equal. The adding of leases to the business does not increase or decrease equity. Use of the basic recommended procedure will normally result in a change in owner equity.

2. It is far simpler in that no separate calculations need to be made to determine the asset value once the value of the liability has been calculated.

Disadvantages of Alternate 2

1. The depreciation pattern may differ from that which would be used with traditional depreciation methods.

DEPRECIATION METHODS

The FFSTF recommends that depreciation systems distribute the cost or other basic value of tangible capital assets, less salvage value, over the estimated life of the unit (which may be a group of assets) in a systematic and rational manner. It is the Task Force's opinion that current tax depreciation will not be seriously misleading for most farm situations. Tax depreciation will normally approximate actual depreciation. Thus, tax depreciation is accepted as appropriate for income statement purposes.

Since all tax methods force the total depreciation to equal the amount paid (cost) minus any salvage value, long run depreciation will be correct. Also, if a farm purchases an approximately constant amount of machinery each year, total depreciation for the farm for any year will be appropriate (except immediately after changes in tax laws).

Tax depreciation may not be appropriate if it deviates considerably from economic depreciation of the asset. Economic depreciation is defined as the allocation of the cost of the asset over the economic life of the asset in a manner that is consistent with the proportion of the physical or economic value of the asset that is used up in each period. For example, if a machine with an initial cost of $100,000, a useful life of 10 years, and a 20 percent salvage value, is equally useful during the life of the asset, straight-line depreciation may represent economic depreciation. Research indicates that other methods, such as sum of the year's digits, 150 percent declining balance, and double declining balance over the life of the asset, are more representative for many assets. Actual exact economic depreciation is unknown for most assets. Thus, any comparison of tax depreciation with economic depreciation will require judgement. The Task Force does not expect perfect equivalence. Methods that allocate the cost of the asset over a period close to the economic life in a reasonable manner will likely be acceptable.

Preparers and users of financial statements need to be aware of changes in tax laws. If basic laws change, or a business qualifies for special treatment that allows extremely fast or slow write-off of assets, net income of the business may be misleading.

The primary example in current tax law is Section 179 Special Election that allows the write-off of up to 100 percent of any asset in the year of purchase. This is currently limited to $17,500 in each year. The effect of this election is to increase expenses (depreciation) in the year of purchase and reduce expenses (depreciation) over the rest of the depreciable life of the property. It will also increase deferred taxes, compared to normal depreciation schedules, because the tax basis of the property immediately drops by $17,500 or becomes zero. If a business is sufficiently small that the immediate write-off of $17,500, rather than taking regular depreciation, would materially influence net income, practices relative to Section 179 property should be noted on the income statement.

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