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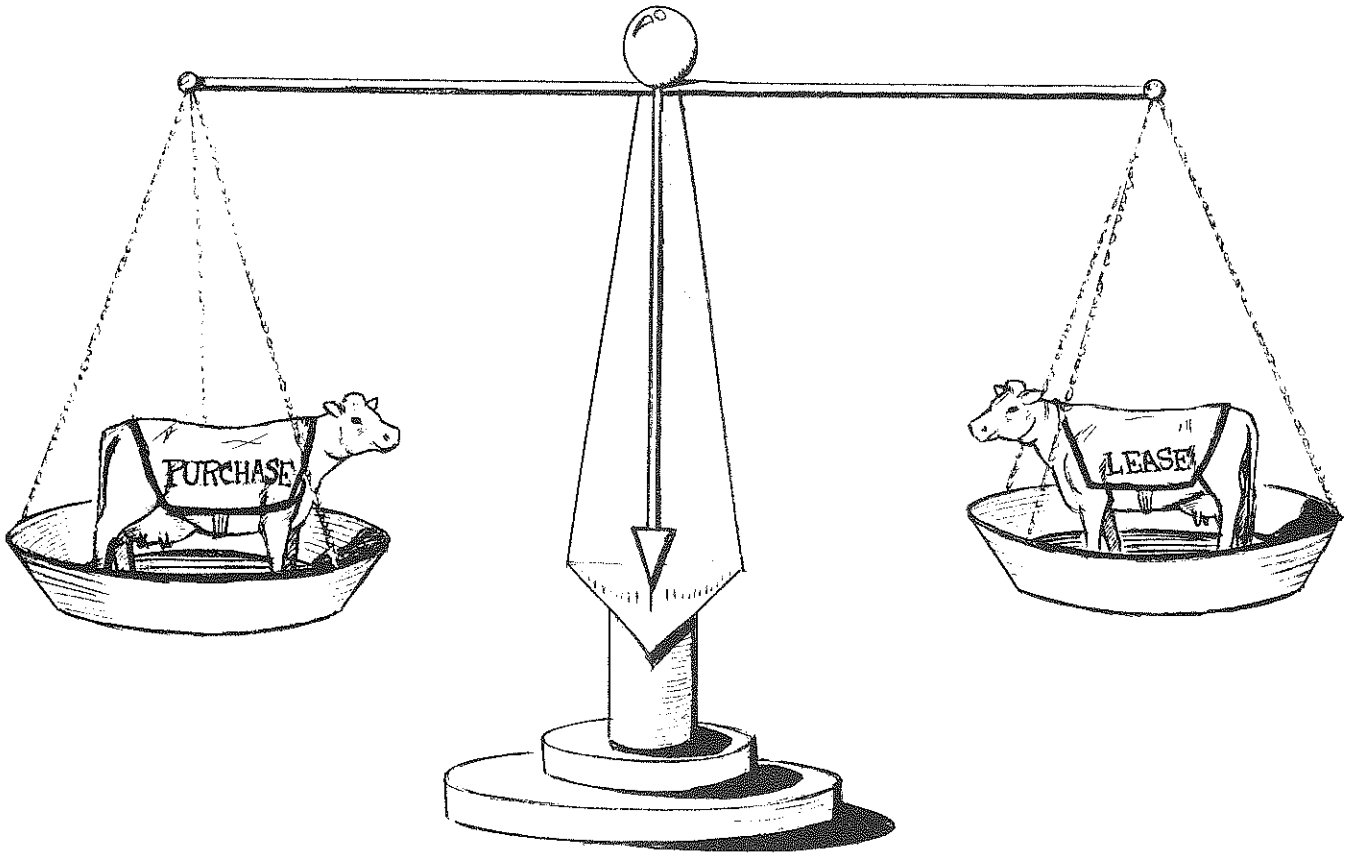

by

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THE ECONOMICS OF FINANCIAL LEASING OF DAIRY COWS

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High interest rates and the ever increasing need for larger amounts of capital to finance farm businesses lead farmers to continually search for new and better sources of capital. Leasing has been used as a method of obtaining control of farm real estate for centuries. Machinery leasing has long been extensively used in nonfarm industry and has recently seen increased use in agriculture.

Recent high interest rates and the favorable tax treatment accorded livestock have resulted in considerable increase in both the availability and use of financial leasing of dairy cows. The availability of dairy cow leasing has increased because investors recognize the dairy cow investment as an opportunity to obtain a highly leveraged investment that generates investment tax credit, depreciation deductions and capital gains income. At the same time some dairymen with limited funds view leasing as a way of obtaining the use of cows that would otherwise be unavailable. Others see leasing as a method of converting tax credits and deductions that may be of limited use into cash through low lease payments. Use of financial leasing allows dairymen to tap a source of nonfarm equity capital that would otherwise be unavailable to agriculture since money provided through financial leasing would likely be invested in nonfarm investments in the absense of leasing.

This publication presents information on how dairy cattle financial leasing works and an economic analysis of leases available to dairymen in 1981. Some analysis from the perspective of the investor and management company as well as that of the dairyman is presented to assist in understanding the process.

Definition of Terms

Lessor versus Lessee

The lessor is the person, or firm, that owns the asset and agrees to let somone else use it in return for periodic lease payments. For dairy leases the investor is the lessor.

The lessee is the person, or firm, that actually uses the asset. He does not own the asset but makes periodic payments for the right to use it. For a dairy cow lease the dairyman, who is responsible for milking the cow, is the lessee.

Operating versus Financial Lease

Leases are generally divided into two groups; operating leases and financial leases. In general terms an operating lease involves obtaining use of an asset for a period of time much shorter than the life of the asset. The lessee does not consider purchase of the asset to be a realistic alternative. Machinery is frequently leased on this basis for periods ranging from an hour to several months. The lessor is responsible for insurance, taxes and major repairs and the farmer covers variable expenses such as fuel, lubrication and routine maintenance. Such leasing is frequently done on a rather informal contractual basis and is often referred to as renting.

The financial lease is a longer term contract which essentially provides financing to the lessee. The contract frequently runs for a large part of the expected life of the asset being leased. The lessee generally views buying the asset as a direct alternative to leasing. The lessee normally pays all nonfinancially related costs of maintaining and using the asset. With machinery, for example, the farmer is normally responsible for all repairs and maintenance.

The dairy cow leases analyzed in this publication are viewed as financial leases because buying the animal is the relevant alternative. The decision of whether to lease or buy is based on the relative costs of the two methods. Even those who cannot borrow the funds to buy the animals generally view leasing as a source of capital rather than as a way of obtaining the use of assets they cannot buy.

Farmer versus Dairyman

With a dairy cow lease the investor who owns the cow is legally a farmer. In order to insure that the lease confirms the investor's status as a farmer and, thus, his or her right to the tax advantages that ownership provides, dairy cow leases frequently refer to the investor lessor as the farmer. Thus, the lessee (dairyman) is in effect hired to care for the animals and receives for his or her efforts all of the milk check and other income from the animals except the lease payment. The lease payment may even be identified as the lessors share of milk proceeds.

Since the lessor and the lessee are both legally farmers this publication will avoid use of the term farmer. The lessor will include the investor and any associated management company. The lessee will be referred to as the dairyman.

Characteristics of Dairy Cow Leases

With a dairy cow lease the lessor owns the dairy cattle and the dairyman buys use of the cattle for a prespecified period by making monthly lease payments. At the end of the lease period the dairyman returns the animals to the lessor. At no time throughout the duration of the lease does the dairyman have any ownership interest in the animals.

The duration of dairy cow leases range from one to seven years. Those with a one-year term usually involve automatic renewal of the lease at the end of each year unless either party notifies the other 30 to 90 days before the end of the year indicating that he or she will be terminating the contract at the end of the year.

These leases are noncancellable contracts. In most cases the only way that a farmer can avoid continuing with the lease is to return the cows and pay the lessor a sum approximately equal to the remainder of the payments that would be made if the lease were continued for its normal life. In effect, this means making all the lease payments but not getting the cows.

With some dairy cow leases the dairyman makes all culling decisions and provides all replacements. With these leases the dairyman has complete control over use of the asset but the lessor is providing only the capital invested. In this case the dairyman returns to the investor at the end of the lease a herd of cows equal in quantity and quality to those obtained at the initiation of the lease.

With other leases the lessor makes culling decisions and provides all replacements. The degree of involvement of the dairyman in the culling decision varies. His advice may be relied upon heavily or he may have no voice in the decision. In some cases all culling, even of an injured animal, requires written permission from the lessor. When the lessor provides replacements he or she also normally gets all cull cows and calves.

The basic lease payment may be specified as an absolute amount per month, say $30, or as a percent of the value of the animal leased per month. It may even be based on the amount of milk the animal produces. When the lease rate is based on cow value, the value used is usually the price paid for the animal by the lessor. However, many leases require compensation to the lessor in addition to the basic lease payment. Examples of additional types of compensation include 1) providing the lessor with bred heifers each year, 2) raising youngstock (heifers or bulls) for the lessor for a set fee and 3) assistance with special breeding programs.

The dairyman is normally expected to use generally accepted dairy husbandry practices. Records must be kept on the timing and identity of all animals replaced. In some cases the dairyman will be required to use DHIA, other official testing or specific breeding programs.

The lessor normally pays the fire and casualty insurance. If DHIA or special breeding programs are required, they are sometimes paid for by the lessor.

The Investor Perspective

There is considerable variability in the character of livestock lease investors (lessors). In a few cases they are farmers who start leasing with excess animals from their own herd. Or, they may view cattle as a good investment and use leasing as a method of handling purchased animals in excess of their own physical capacity. Some are cattle dealers. However, in most cases the funds for purchase of leased animals are provided by high income nonfarm investors who see agriculture as a good investment.

Investors who find financial leasing of dairy cows attractive are seeking a high after-tax rate of return on invested funds. They are generally in a high tax bracket and, thus, tax shielded income such as capital gains income and tax credits, such as depreciation and investment tax credit, are of high value to them. In most cases investors use their own funds for only part of the total cattle investment and borrow the rest. This provides the investor with the potential for greater profit (or loss), but more importantly, increased the level of shielded income and tax credits relative to the investment of their own funds.

Many investors know little about dairy farming and, thus, employ the services of a management company to handle the direct contact with the dairyman. Use of a management company also relieves the investor of most of the work connected with use of the lease.

Management Companies

Management companies perform several functions. The basic function is to serve as an interface between the investor and the dairyman. In many cases neither the investor nor the dairyman completely understand or trust the other. A management company can reduce the risk for both parties.

The management company will normally handle the legal arrangements necessary to establish a lease. The main activity that this involves is construction of a lease agreement that clearly specifies the relationship between the lessor and lessee and protects the interests of the lessor and the lessee. However, since the management company is working with or for the lessor most leases provide more protection for the investor than for the dairyman.

The management company also oversees the purchase of the animals to be leased and conducts periodic security checks of the animals leased. Security checks involve making sure that leased animals have not disappeared, that culled animals have been replaced as specified in the lease, that the animals are being properly cared for and that any other conditions of the lease are being properly fulfilled. If the lease specified that the lessor will make culling decisions and provide replacements, the management company will carry out that function. Security checks are often made on a monthly basis.

Records must be kept as to the exact identity of leased animals and any replacements. In most cases these records are maintained by the dairyman. The management company is responsible for insuring that such records are kept and maintaining an investor copy of the records. When the management company is responsible for culling and replacements, records of these actions and transactions must also be maintained.

At termination of the lease the management company is responsible for either renewing the lease with the dairyman or removing the herd from the dairyman's farm and either selling it or finding another dairyman to lease the animals. Also, in cases where a lease is terminated early due to default on the part of the dairyman, the company must perform the same function. However, this type of situation also frequently involves disagreeable interaction with the dairyman at many points. Determining whether and why default has occurred is often an onerous task. If default results from general failure of the business, leased animals and other security may disappear, identity of a leased animals may be contested by the dairyman or other lenders and physical removal of the animals may be difficult and accomplished only at some risk.

The other major service that the management company provides is that of bringing together the potential investor who has money to invest and the dairyman who would like to obtain animals. Because of the importance of this function, a number of management companies have been developed with the sole objective of providing this service. Firms in the business of handling leases bring the investor and dairyman together by establishing a standardized lease contract that provides a basis for any investor to invest in a dairy cow lease and any dairyman to lease cows. Frequently firms even provide a credit source for the investor to obtain the borrowed funds required for a profitable lease arrangement.

The standardized lease is used as a basis for advertising to both investors and dairymen. Thus, a company will normally be running two simulataneous advertising campaigns; one in financial magazines and papers such as the Wall Street Journal telling groups who may have money to invest of the profit potential of dairy cattle leasing, and a second to dairymen indicating what leasing can do at the farm level.

For the services that management companies provide they charge a fee. The fee is normally based on the amount invested or the lease payments and other renumeration received by the investor. The magnitude of these fees vary considerably due to the range in service provided and the level of profit required by the company.

Some investors do not use a management company. In this case the functions of the company are conducted by the investor. This occurs most frequently when the investor is also a dairyfarmer. In other cases the management company is also the investor. For both of these situations some efficiencies are gained because there are fewer entities involved, but it requires that either the investor has a knowledge of dairy farming or that the management company has funds to invest.

An Example

To illustrate the costs and returns involved for the lessor (investor) an example is presented in tables 1 and 2. The situation contains a number of the characteristics found in existing lease situations but is not an actual case for any particular investor. In this case a management company is used. Table 1 contains the characteristics of the lease. An economic analysis from an investor's point of view appears in table 2.

Table 1. CHARACTERISTICS OF A TYPICAL DAIRY COW LEASE AND INVESTOR SITUATION

1.	$10,000 invested
2.	$30,000 borrowed (7 year term, 18% interest, cows used as collateral)
3.	50% tax bracket (marginal-combined federal and state)
4.	Management company fees are:
	a. 15% of original investment
	b. 50% of value of heifers raised
	c. 50% of herd value at the end of the lease
5.	Cows are leased for seven years
6.	$34,000 used to purchase cows (26 cows at approximately $1,300 each)
7.	Investor receives lease payments of:
	a. 1.25% of net cow investment per month
	b. Heifers equal to 10% of herd (offspring of leased animals, raised by the dairyman)
8.	Culling rate 25%
9.	Cull animals are valued at $500
10.	Rapid ACRS[a/] depreciation is used
11.	Investor opportunity cost of capital is 18% (9% after tax)

a/ Accelerated cost recovery system

In table 2 cost recovery is divided into three parts. Depreciation is that part of the investment in cows that are kept throughout the year (and into the next year) that is written off as a deductible expense. This conforms to the historical definition of depreciation. For example, a $1,300 cow kept throughout the year would result in depreciation of $195 ($1,300 x 15%). No depreciation is taken on animals in the year they are sold.

Table 2. INVESTOR ANALYSIS OF TYPICAL DAIRY COW FINANCIAL LEASE

Item	Year 1	2	3	4	5	6	7
	dollars						
Cost Recovery:							
Depreciation[a/]	3,923	3,740	2,014	0	0	0	0
Loss[b/]	4,846	4,281	1,943	253	0	0	0
Maintenance charge[c/]	3,000	3,500	3,000	3,500	0	0	0
TOTAL	11,769	11,521	6,957	3,753	0	0	0
Inflows:							
Investment tax credit							
Federal	3,400						
State	2,040						
Lease payment	5,100	5,100	5,100	5,100	5,100	5,100	5,100
Heifers			3,900	2,600	3,900	2,600	3,900
Youngstock							3,250
Cows							34,000
TOTAL	10,540	5,100	9,000	7,700	9,000	7,700	46,250
Outflows:							
Loan payment							
Interest	5,212	4,751	4,201	3,542	2,755	1,814	688
Principal	2,355	2,816	3,366	4,025	4,812	5,753	6,873
ITC recapture	1,256	1,144	705	503	0	0	0
Management fee	6,000	0	1,950	1,300	1,950	1,300	20,575
Tax[a/]	-8,941	-5,586	-3,224	-1,228	978	1,513	1,124
TOTAL	5,882	3,125	6,998	8,142	10,495	10,380	29,260
Net inflows	4,658	1,975	2,002	- 442	-1,495	-2,630	16,990
Present value	4,273	1,662	1,546	- 313	- 972	-1,568	9,294

a/ Using rapid ACRS (accelerated cost recovery system) depreciation

b/ Amount by which undepreciated balance exceeds cull value

c/ Value received for culls but paid directly to dairyman. For simplicity the investor could use the mass asset cost recovery system. However, this would limit the rate of cost recovery and delay some tax gains

Loss occurs for animals that are sold and is the difference between the undepreciated value of the cow (cost minus depreciation taken in prior years) and the value received for the animal when culled. If our example cow is culled in year two, the loss is $1,300 - $195 = $1,105 minus the $500 received as a cull, which equals $605.

With this lease the dairyman gets to keep the amount received for the cull cow ($500). However, from the investor's point of view, this cull value represents the return of capital invested. If the investor received the $500 it would be nontaxable income. Thus, from a tax point of view, the fact that the dairyman gets the value is equivalent to saying that the investor received the $500 and then paid it to the dairyman to assist with replacing the animal and maintaining the herd. The receipt is nontaxable but the payment to the dairyman is a tax deductible expense to the investor. This expense it titled "maintenance charge" in table 2. There is no before tax net cash flow effect from this because the cull value received is exactly offset by the maintenance charge. There is a tax effect because the maintenance charge is tax deductible.

The value of heifers changes from year to year because of rounding. Ten percent of cow numbers would imply an average of 2.6 heifers per year raised. To accomplish this in a practical manner, three are raised the first year, two the second, three the third and so forth. This results in an inflow of $3,900 in some years and $2,600 in other years.

Federal investment tax credit is 10 percent with recapture of two percent for each year less than five that the animal is kept. New York State investment tax credit is six percent if the expected life is four years or greater. Recapture is proportional to the amount that actual life is less than expected life. A four year life was used. An animal culled in year three has $\frac{4-3}{4} = .25$ of the investment credit recaptured.

Present value is the value of the net inflows measured in dollars equivalent in value to those invested. This is calculated by discounting the inflows for the fact that a dollar received in the future is worth less than one received today. After converting the net inflows to their present value, the net present value of the investment can be calculated by subtracting the amount invested from the sum of the present value of inflows. For this particular lease the net present value is $3,992 ($13,992 sum of present values minus $10,000 invested). That is, the investor would have to be paid $3,992 today to not enter into the lease in order for him or her to be equally well off financially compared to making the investment.

From an investor's point of view the cow lease has some other very positive characteristics which are exhibited in this example. First, the year one net inflows total nearly half of the original investment. The primary contributors to this net inflow are the investment tax credits and the high level of depreciation type deductions that reduce income taxes. The total initial investment is nearly repaid within the first three years. For the extremely tax conscious lessor the tax reduction provides a psychological benefit in addition to the economic savings due to the reduced monetary tax burden.

Secondly, a significant proportion of the returns to the investment are in the form of capital gains income. The heifers will qualify because they will not be sold until they are over two years of age. The entire cow herd has been raised by the dairyman for the investor to replace the originally purchased animals and, thus, qualifies for capital gains treatment. Although the management company's fee is related to the sale of animals, the fee itself is an ordinary expense. This allows the investor to obtain a high level of capital gain income and ordinary expense. Some of the leases currently in use and that will be analyzed later in this article, employ a higher lease fee and eliminate the heifer requirement. This is more acceptable to many dairymen but shifts some income from capital gain to ordinary income for the investor.

It is clear from the example analysis that leasing can be profitable for the lessor. Because each lease has its own particular characteristics, some leases are more profitable than others. However, since at least some are quite profitable for the lessor, investors are likely to continue to be interested in leasing opportunities. Changes in tax laws could, of course, significantly effect the level of profitability and, thus, investor interest. However, under current conditions, if dairymen want to lease cows it is quite likely that they will continue to be able to do so.

Terms and Conditions Found in Leases

In assessing any lease a dairyman should carefully look at the terms and conditions of the lease. Like any written contract "reading the fine print" can pay big dividends. A number of terms and conditions found in some leases are discussed below. In some cases the dairymen should look for these terms or conditions like he or she looks for rats in the corn crib, others can be benefical.

Blanket Security Agreement

Either as a condition of the lease or, more frequently, as a practice of the lessor, the lessor frequently takes a blanket security agreement (and files a financing statement) on all cattle, equipment and any other personal property of the dairyman. This is often explained as a routine security precaution that will have no effect on existing lenders. However, such an agreement severely limits the financial flexibility of the business. The dairyman's equity in other assets such as cattle, equipment and crops may be effectively unusable. Under normal conditions dairymen often pledge the equity they have in existing assets so that they can obtain 100 percent financing of new items. Many replacement machinery and cattle purchases are financed this way. The lender advances 100 percent of the cost of the new item and takes a lien on the new item and other existing property as a security. If a new security agreement is required for new financing, the lender may be unable to provide financing in this way when the lessor has prior claim on the existing assets. Such a situation may limit the dairyman to purchase money security financing of items such as livestock and equipment. In this case only the item being purchased is used as security. Many lenders will require a down payment on such financing. Financing of planting and other operating expenses may be very difficult due to the unavailability of pledgable security.

Institutional lenders can be expected to be more cautious in dealing with a dairyman with leased cows. If the lessor takes a blanket security agreement on all property this severely limits the institutional lender's ability to provide funds and otherwise adjust to unusual or emergency situations and, thus, can interfere with the optimum financing of the farm business. Also, if leased animals do not make up 100 percent of the dairy herd, the security of a lender with a security agreement covering the remainder of the dairy herd is depreciated. If financial reverses occur it is often difficult to determine which cows are leased and which are owned, particularly when animals in both groups are continuously being culled and replaced by the dairyman. Both of these factors increase the institutional lender's risk and, thus, may limit capital availability to the farm business.

It is clearly in the best interest of the dairyman to limit the coverage of any security agreement. Preferably only the animals leased would be required as security. However, if the lessor insists on more security, limit the agreement to as few classes of property as possible (for example, only cattle), or

to only specific pieces of property (possibly only the combine). This leaves the equity in other assets free for financial arrangements with other lenders.

Deposit Requirements

The deposit requirements of some leases are substantial. This effects lease profitability in that the deposit represents funds that the dairyman has tied up on which no return is received. But, more importantly, for most situations a large deposit can cause serious cash flow problems in the first year of the lease. Many leases require one month's lease payment in advance and this could not be considered unreasonable. However, the requirement of three or four lease payments in advance, or as specified in one lease, a deposit of 100 percent of the milk check for the first two months can be burdensome. Any potential cash flow advantage of leasing is certainly wiped out for the most important year of the lease; the first year.

Selection of Animals

The quality and health of animals leased will influence the profitability of the dairy operation. Some lessors allow the dairyman to select the animals. In this case equivalent animals can be obtained with either lease or purchase. In other cases the lessor already owns or plans to purchase specific animals to be leased. In this case the dairyman should carefully appraise the animals to be leased or insist on the right to refuse any animals that are unacceptable.

Culling Decisions

When the lease requires that the dairyman make all culling decisions and provide all replacements, the leased herd can be managed just like a purchased herd. However, when the lessor does the culling and provides the replacements, extreme care should be exercised by the dairyman to be sure that the decisions made by the lessor will be acceptable. There is considerable room for conflict between the lessor and the dairyman on these decisions. With most leases a low producing cow returns just as much to the lessor as a high producing one. For registered animals the expected value of future offspring may result in investor resistance to culling animals with good historical records in spite of current health problems or long dry periods. For most leases the dairyman bears the cost of the health problems and long dry periods and the investor achieves the gain from the high value offspring.

For general culling decisions the dairyman is at the mercy of the lessor and, thus, should be sure that he or she is comfortable with the culling decision criteria to be used and the person making the decision. Some of the criteria to be used could be specified in the lease. The long dry period problem is handled in one lease by requiring the lessor to pay the dairyman a maintenance fee for all animals dry over 60 days. With such an arrangement, criteria for drying an animal off might be required.

Replacement Animals

As indicated earlier some leases require the dairyman to replace all culled animals. However, when the lessor is to provide replacements, the quality and character of those replacements can strongly affect farm profitability. Minimum criteria for productive capacity, stage of lactation and age likely should be specified in a lease where the dairyman has little control over replacement selection.

Performance Standards

Most leases require that the dairyman employ modern, generally accepted dairy husbandry standards. However, leases can establish standards of performance that are either unrealistic or interfere with normal use of the leased asset. This is frequently accomplished through specification of feeding, breeding and other management practices or requiring that the level of production exceed some specified level. These requirements are frequently designed to increase the value of offspring or enhance milk production where the lease payment is based on the level of production. For example, one lease required that a 16,000 pound rolling herd average be maintained, but the lessor was going to supply all first calf heifers. Most dairymen would be unable to meet that standard.

The biggest problem with these standards is that they are a basis for determining dairyman default on the lease. If the standards are not met, the dairyman would, at minimum, continually live under the uncertainty that the lessor could declare default at any time. At worst, not meeting the standards would result in termination of the lease under default provisions. Default termination may make the dairyman responsible for all costs of removing the animals from the farm, replacements of animals in current ill health and other costs that would be borne by the lessor under normal termination of the lease.

Calves

Calves may be the property of either the lessor or the dairyman. If they belong to the dairyman they can be an important source of income and replacement stock. In some cases bulls and heifers may be treated differently. For example, the bull calves may go to the dairyman and the heifer calves to the lessor.

When the lessor owns the calves two questions remain 1) who raises them and 2) who pays the growing costs. In some cases youngstock are removed from the farm at three to seven days of age. In other cases the dairyman is expected to raise part or all of them for the lessor. If this is a part of the lease payment, the number raised is usually only a fraction of the total, but the dairyman is responsible for all costs. In this case the heifer raising costs are a cost of the lease. In addition when the dairyman must provide all replacements he or she must be concerned about whether there will be sufficient heifers born to provide the heifers the lessor receives and to replace culled animals.

Frequently the lessor pays the dairyman a set fee per animal, per month for raising youngstock. If the fee is high enough or the dairyman's heifer growing costs are low enough, the dairyman may make a positive net income from heifer raising that would offset part of the lease cost. However, when the fee is below the cost of raising replacements this increases the cost of the lease.

Even when the fee paid is appropriate at the time the lease is initiated adjustments for inflation of growing costs need to be allowed for in the lease, particularly for long-term leases. Average total costs of raising replacements as indicated by New York Cost Accounts[1/] farms are shown below.

Year	Average total cost per month per heifer
1977	$25
1978	29
1979	34
1980	39

1/ Livestock costs and returns from Farm Cost Accounts, Department of Agricultural Economics, Cornell University, Ithaca, NY

A dairyman who entered into a four-year lease in 1977 with an agreement to raise heifers on a break-even basis for $25 per month would be losing $14 per month per heifer by 1980.

Another important element in a lease is whether bull calves must be raised, and if so how many. Leases of registered animals frequently do not limit youngstock raising to heifers. The normal assumption is that relatively few bulls will be raised. However, it is in the dairyman's best interest to have a limit on the total number of bulls that can be raised written into any lease where bull raising can be required. Most dairymen have limited factilities for handling bulls, particularly if they must be raised to service age.

Insurance Requirements

Normally the lessor carries the fire and casualty insurance on the animal. This represents a small savings to the dairyman. However, many leases require the dairyman to carry a resonably high level of liability insurance. The reason for this is that the investor wants the dairyman to be able to handle any suits that might arise from actions of the investor's dairy cows. For example, if the lessors cows get out in the road and get hit by a car resulting in injury to the car or its occupants, a suit may result. Although increased liability insurance could increase costs, the amount of insurance required in leases observed to date do not exceed the levels that prudent dairymen should carry with or without the lease.

Records

When the dairyman provides replacements, records must be kept indicating the identity of all animals owned by the lessor. Frequently these must be provided to the investor on a monthly basis. In some cases the lease will require that DHIA or other breeding records be kept. For the most part these records should be kept for good herd management. However, if official DHIA records are required on a farm where less expensive owner-sampler records would be used, the increased expense is a cost of leasing.

Right of First Refusal

A lease provision giving the dairyman right of first refusal on the dairy herd at the end of the lease can be very valuable to the dairyman. The value of the animals at the end of the lease can be established by qualified appraisers agreed to by both parties. Sometimes three appraisers are used: one appointed by the lessor, one by the dairyman and one selected mutually by the other two. The amount paid by the dairyman can be market value or some lesser amount. In other cases maximum price is established in the lease as current market value or some percent (say 125%) of the initial value of the cows leased.

From the lessor's perspective, the right of first refusal can facilitate sale of the animals at the end of the lease. In addition, there are several advantages to the dairyman. It gives the dairyman at least one option for uninterupted operation of the business at the end of the lease period. Assembling a new herd can involve some expense in transportation, higher vet bills and lower production. These costs can be avoided if the herd that has been on the farm for some period of time remains on the farm. This also reduces the temptation to reduce culling and use less valuable replacement animals near the end of the lease, and provides incentive for continued improvement in the genetic capacity of the herd through use of better herd sires throughout the duration of the lease. For long-term leases both of these practices improve the profitability of the

leased herd somewhat during the lease period.

Lease Period

The lease period for most leases currently available range from one to seven years. The length of the lease period can significantly effect the tax benefits, particularly investment tax credit, that the lessor can obtain. However, the farmer must be sure that the lease period is consistent with the planned future operation of the business. A seven-year lease may limit a farmer's cattle ownership options for longer than is desirable.

Termination

A lease normally cannot be cancelled or terminated during the stated term of the lease. However, some leases have a contract period as short as one year with automatic renewal unless the dairyman or lessor give notice at least 30 to 90 days in advance. Such a clause gives the dairyman considerable flexibility.

The termination conditions, upon default of the dairyman, should be reviewed carefully. In some cases the dairyman becomes liable for expenses under a default termination that he or she is not liable for under normal termination. These include such expenses as the cost of moving the animals to another location and replacement of any animals in ill health at the time of termination.

Economic Evaluation of Existing Leases

There are two basic cases where cow leasing can be expected to be used by dairymen. First, if leasing is more profitable than borrowing the money and purchasing the cows, many farmers would decide to lease cows rather than borrow the funds to buy them. Those who are starting or expanding dairy operations can lease instead of buy. Others, who own their animals, can sell the animals to investors and lease them back.

Second, dairymen who are unable to borrow funds to buy cows may be able to obtain the animals they desire through leasing. People in this situation may lease cows even if leasing is not more profitable than borrowing for those who can borrow. For these situations the appropriate question is not, "should I lease or borrow and buy"? but "should I lease or not milk cows (or not milk more cows)"? Answering this latter question requires that the dairyman determine whether having the cows will add sufficiently to income, that net income will result from leasing the cows. If the lease being considered is an expensive source of capital the dairy business must be very profitable to make leasing pay.

In the analysis that follows, leases are evaluated for the situation where funds can be borrowed to purchase the animals if that alternative is most profitable. The question being addressed is, "should I lease or buy"? If leasing is to become a widespread source of capital for farmers, it must be profitable for farmers who can get capital elsewhere since they represent the majority of cattle investment.

The leases assessed are those available to New York farmers in 1981. The home base for the lessors, frequently represented by the home office of the management company, include the Northeast and North Central states.

The Procedure and an Example

The leases were evaluated using discounted cash flow techniques similar to those used in the investor analysis described earlier. Assuming that the quality of the cow is the same with either purchase or lease, the buy versus lease decision reduces to a question of which is lowest in cost. To determine this, the present value of the after tax cost is calculated for both alternatives. The leases were evaluated for a typical farm situation with the characteristics listed in table 3.

Table 3. CHARACTERISTICS OF TYPICAL FARM SITUATION

Assumption Number	Description	Value
1	Value of cow (leased or purchased)	$1,300
2	Quality of animal purchased and leased	Identical
3	Minimum lease period (to allow accurate comparison with purchase alternatives)	4 years
4	Credit terms with purchase	4 years 16% interest monthly pymts
5	Culling rate (1/4 of animals replaced each year)	25%
6	Cull cow value	$ 500
7	Dairyman's marginal tax bracket (combined federal and state)	30%
8	After tax discount rate (approximately 13% before tax)	9%
9	Calves per cow (13 month calving interval, 10% mortality)	.83
10	Value of calf	$ 70
11	Replacement cost	$1,300
12	Value of fees per year: Breeding	$ 25
	DHIA	18
	Fire & Casuality (% of value)	0.5

The analysis procedure used is illustrated in table 4 which presents the results for the lease introduced in tables 1 and 2 for the typical farm situation defined in table 3. In table 4 "youngstock" refers to heifers being raised for the lessor that are under two years of age and, thus, do not qualify for capital gains tax treatment. These animals are turned over to the investor at the end of the lease. Costs saved in this case is the fire and casulty insurance paid by the management company. Cost recovery is similar to that experienced by the lessor and discussed earlier, except that the value of cull animals is a return of capital and, thus, nontaxable to the investor. Tax shield represents an increase in the amount of taxes paid.

Table 4. DAIRYMAN ANALYSIS OF TYPICAL DAIRY COW LEASE

Program and item	Year 1	2	3	4	5	6	7
	dollars						
Lease							
Lease payment	5,100	5,100	5,100	5,100	5,100	5,100	5,100
Heifers			3,900	2,600	3,900	2,600	3,900
Youngstock							3,250
Costs saved	6	6	6	6	6	6	6
Tax shield	1,528	1,528	2,698	2,308	2,698	2,308	3,673
After tax cost	3,566	3,566	6,296	5,386	6,296	5,386	8,571
Present value	3,271	3,002	4,862	3,815	4,092	3,212	4,688
Purchase							
Cost recovery:							
Depreciation	3,923	3,740	2,014				
Loss	4,846	4,281	1,943	253			
TOTAL	8,769	8,021	3,957	253			
Principal	6,593	7,728	9,060	10,619			
Interest	4,970	3,835	2,503	944			
Invest. tax credit	5,440						
ITC recapture	1,256	1,144	705	503			
Cow value							-34,000
Tax shield	4,122	3,557	1,938	359			4,080
After tax cost	3,257	9,150	10,330	11,707	0	0	-29,920
Present value	2,988	7,702	7,977	8,293	0	0	-16,366

The cow value which occurs in year seven with purchase is the value of the animals at that time. With a lease the dairyman does not own the animals at the end of the lease. To make the comparison with leasing valid, it is assumed that the animals owned are sold at the end of the lease period. It is this sale that increases taxes. The anlaysis could have been carried out under the assumption that a dairyman who leased the cows would have to buy the animals at the end of the lease in order to be equally well off compared to purchase. The results would be the same, but the analysis more complex.

The net profitability of leasing is determined by summing and comparing the present value of costs for purchase and lease as shown in table 5. For our example situation, the lease was less profitable than purchase. The $629 per cow or $16,348 is the amount that the dairyman would have to be paid on the day the lease initiated in order to be equally well off compared to purchasing the animals with borrowed funds.

Since leases evaluated have different contract periods, the total present value advantage is frequently not comparable for different leases. To develop a comparable basis of evaluation, the per cow present value is converted to an equivalent annual after tax advantage by dividing advantage over the lease period by the present value factor for the term of the lease. This process can be expressed in equation form as; $A = \frac{Nr}{1-(1+r)^{-n}}$

Where A = Annual after tax advantage

N = Net present value advantage of lease

r = Discount rate

n = Years of lease

Table 5. DISADVANTAGE OF LEASING FOR TYPICAL DAIRYMAN AND TYPICAL LEASE SITUATION

Present value of costs with purchase	$26,942
Present value of costs with lease	10,594
Present value advantage of purchase	16,348
Number of cows	26
Advantage of lease per cow	$ 629
Present value factor (7 years)	5.033
Annual after tax advantage of purchase	$ 125

The Results

As indicated previously, there is considerable variation in the terms of leases. The basic lease rates charged by the seven leases evaluated are indicated in table 6. Most of the leases involved other minor charges or had lease terms, such as a large security deposit, which affect the profitability of the lease. These other factors were included in lease evaluation but are not listed in table 6.

Table 6. BASIC LEASE RATE CHARGED ON DAIRY COW LEASES[a/]
Seven Leases, Northeastern U.S., 1981

Lease Number	Basic Lease Charge
1	$25 per cow per month
2	20% of cow value per year (1.67% per month)
3	3.3% of cow value per month (4 year lease)
4	$33 per cow per month
5	27.5% of milk income (17.5% of income on milk in excess of 16,000 pounds if DHIA average exceeds 17,000 pounds)
6	$20 per cow per month (grade cows)
7	15% of cow value plus one bred heifer per 10 cows per year

a/ Most leases contain other minor charges or conditions which influence economic profitability

The results of the anlaysis of the seven leases for the typical farm situation indicate that leasing is less profitable than purchase for all seven cases (table 7). However, there was considerable variation in the net cost or disadvantage of leasing, ranging from near break-even to a loss of nearly $300 per cow per year. The tremendous variability in costs likely results, at least in part, from the immaturity of cow leasing as a financial procedure. Some narrowing of the cost spread can be expected over time as farmers gain experience with leasing and appropriate evaluation methods become more widespread. However, variability in lease provisions will allow maintenance of considerable variability in effective lease costs for any specific situation.

Table 7. ADVANTAGE OF PURCHASE OVER LEASE[a/]
Dairy Cow Leases, 1981

Lease Number	Annual Amount Per Cow After Tax
1	$ 36
2	85
3	290
4	128
5	229
6	13
7	107
Average	121

a/ The numerical calculations for lease evaluation were conducted prior to passage of the Economic Recovery Tax Act of 1981 and, thus, embody pre 1982 tax law. The new tax law has little impact on profitability of leasing from the dairyman's point of view. The increased investment tax credit is largely offset by increased investment tax credit recapture and slower depreciation

The term of the leases evaluated varied from one to seven years. Since a financial lease is a noncancelable contract the dairyman is committed to the costs of the lease over the complete lease period. Adding up the costs for all years of the lease period results in a net disadvantage of some leases, in present value terms, of nearly $1,000 per cow (table 8). The importance of this number is that the dairyman has committed himself, or herself, to that level of loss (in comparison to borrowing the money) on the day the lease is signed, and there is little that can be done to reduce that loss. Clearly the survivability of many farms could be seriously impaired by such a decision. The costs of not appropriately analyzing a lease with a lease period greater than one year can be high.

Table 8. AFTER TAX NET COST OF LEASING COMPARED TO PURCHASE FOR COMPLETE LEASE PERIOD
Dairy Cow Leases, 1981

Lease Number	Minimum Lease Period	Advantage of Purchase over Lease for Period (present value)
	(years)	(dollars per cow)
1	1	$ 36
2	7	428
3	3	936
4	1	128
5	5	889
6	1	13
7	7	537

To determine the types of farm situations for which leasing may be a profitable alternative, the effects of changing a number of the characteristics of the typical farm situation was determined. The results of these analyses are presented below.

Cow Price and Quality

Variation in the price of the animals under consideration can reflect either the general level of prices or price can be a proxy for cow quality. Changes in the general level of prices may change the relative cost of some leases.

For example, when the lease rate is a percent of cow value, leasing costs change with cow prices. Conversely leases which provide cows for a set fee become more profitable as the price of the cow increases because ownership costs increase with cow price but lease costs do not. Similarly, if prices decline, lease profitability falls.

For those leases evaluated, those with a lease fee as a percent of the cow price were less profitable as the price of the animals increased (table 9). Apparently the lease fee increases more rapidly as price increases than do net ownership costs. Also, the dairyman who purchases the cows ends up with a higher priced animal at the end of the lease period. This implies that if lease terms remain constant through time inflation will make these leases increasingly unattractive.

As indicated by leases 1, 4 and 6, the value of the cow being leased can significantly affect the profitability of fixed rate leases. Two of the leases are superior alternatives to purchase when the price of the cow leased is $1,600. This, of course, does not mean that it normally pays to lease $1,600 or higher animals. It means that, if you can lease $1,600 animals for the lease rates indicated, the probability that a lease will be a good alternative increases. It is the magnitude of the lease rate relative to the value of the animal that is important.

Table 9. EFFECT OF COW VALUE ON ADVANTAGE OF PURCHASE OVER LEASE
Dairy Cow Leases, 1981

Lease Number	Value of Cow Leased		
	$1000	$1300	$1600
	(annual after tax advantage of purchase)		
1	$ 97	$ 36	$ -25
2	57	85	112
3	214	290	368
4	190	128	67
5[a/]	295	229	164
6	74	13	-47
7	76	107	132
Average	138	121	105

a/ Does not reflect cow quality differences

The data in table 9 (except for lease number 5) also shows the impact of cow quality on the attractiveness of leasing under the assumption that price reflects quality. As one would expect getting a higher quality cow for a given price is good business. Two of the leases were profitable with cows priced at $1,600. This implies that a good cattle judge who was given the right to select leased animals from a larger group might be able to increase the profitability of leasing.

When the lease rate is based on the value of the animals, leasing becomes increasingly less profitable as cow quality increases. Thus, leases appear to favor lower quality cows. This does not imply that it is most profitable to lease low quality cows. The analysis assumes that the same quality animal is acquired with either lease or purchase. It does imply that if the quality of the animals under consideration is low, the likelihood that leasing will be a good alternative increases.

Replacement Cost

Leases which provide all replacements relieve the dairyman of the cost and the managerial effort required to raise replacements. If the dairyman's cost of raising or buying replacements is high, leasing may allow the dairyman to avoid this high cost activity. On the other hand, a dairyman with low replacement costs may be giving up a profitable part of the business. For the leases evaluated, replacement costs of $1,500 per animal would sometimes make leasing profitable (table 10). All leases were quite unprofitable when replacements costs were low.

The appropriate cost or value concept to employ in assessing a value for raised replacements may vary between farms. From an economic viewpoint the cost of raising replacements is irrelevant since raising replacements is not a requirement connected with the dairy cow herd per se. In this case the appropriate value to use for replacements is their opportunity cost at the time they enter the herd. Whether profit is made on the heifer raising enterprise is not instrumental in determining lease profitability. In this case the correct value to use is the amount that could be received for the animals if they were sold instead of being used in the dairy herd.

From a practical point of view, however, if the cows are leased and all offspring are the property of the investor, the heifer raising activity is no longer part of the farm business. Those without heifer raising facilities or inclination may view this as a direct advantage of leasing. For others, raising heifers may be an attractive and profitable part of farming. Heifer raising may be done largely be family members without nonfarm employment opportunities. In either of these cases heifer raising may become a part of the purchase option. The alternatives become lease or purchase-and-raise-replacements and the appropriate value to use becomes the dairyman's added cost of raising replacements. For farms with existing heifer facilities or low variable costs for heifer raising, selection of a lease where replacements are provided could be costly.

Table 10. EFFECT OF REPLACEMENT COST ON ADVANTAGE OF PURCHASE OVER LEASE
Dairy Cow Leases, 1981

Cost of Replacements	Lease Number[a/]			
	1	4	5	6
	(annual after tax advantage of purchase)			
$1,100	$ 71	$163	$264	$ 48
1,200	57	149	246	34
1,300	36	128	229	13
1,400	19	111	211	-4
1,500	2	94	194	-22

a/ For the other three leases the dairyman provides all replacements of leased animals

Inflation

One of the potential reasons for investor interest in ownership of agricultural assets is to hedge against inflation. An increase in the value of cows over the term of the lease would benefit the lessor. Similarly for leases where the investor receives the cull cow and offspring, inflation in their values would improve the lessor's gain. The corollary of this is that the dairyman gives up this gain. In the past few years many farmers have achieved large increases in net worth because they owned a herd of cows and the value of those cows increased.

Inflation in milk cows, cull cows and calves can increase the profitability of ownership by increasing annual operating income from cow and calf sales and by increasing the value of the cow that the dairyman owns. For the leases evaluated, the average disadvantage of leasing nearly doubled when a 10 percent inflation rate in these items was anticipated and made all leases significantly less profitable than purchase with borrowed funds (table 11).

Table 11. EFFECT OF INFLATING COW AND BEEF PRICES ON ADVANTAGE OF PURCHASE OVER LEASE
Dairy Cow Leases, 1981

Lease Number	Annual After Tax Advantage of Purchase Over Lease With	
	No Inflation	10% Inflation[a/]
1	$ 36	$144
2	85	203
3	290	407
4	128	236
5	229	308
6	13	120
7	107	225
Average	121	228

a/ The value of milk cows, cull cows and calves increase 10 percent per year

The risk involved with a long period lease becomes increasingly significant with inflation. A 10 percent rate of inflation in cow and beef prices can double the annual disadvantage of leasing and place the dairyman committed to a five or seven year lease at a significant disadvantage relative to dairymen who own their herd. Given our inability to predict inflation rates with any real degree of accuracy, the risk involved with a long term lease is high.

Declining Cow Prices

From a different perspective, large surpluses of milk products or poor feed grain harvests could result in low milk prices or high major feed ingredient prices which would generate periods of declining or low dairy farm profitability. The anticipation of such a period, such as that which developed in 1981, could result in a decline of dairy cow prices. A decline in the price of cows over the lease period significantly increases the profitability of leasing because the decline is borne by the lessor (table 12).

Table 12. EFFECT OF DECLINING COW PRICES ON THE ADVANTAGE OF PURCHASE OVER LEASE
Dairy Cow Leases, 1981

Lease Number	Decline in Cow Price over Term of Lease[a/]			
	$ 0	$100	$200	$300
	(annual after tax advantage of purchase)			
1	$ 36	$ 16	$ -3	$-22
2	85	76	66	56
3	290	271	252	232
4	128	109	90	70
5	229	214	199	185
6	13	-6	-25	-45
7	107	97	87	78
Average	121	106	90	74

a/ Four year minimum lease period. Cull cow and calf prices are assumed to be unaffected by change in cow prices

The analysis shown in table 12 assumes that the dairy cow price is independent of cull cow and calf prices. While this is likely never completely ture, the movement in cull cow and calf prices is often modest compared to dairy cow price changes. In general, cull cow and bull calf prices are primarily determined by other factors. To the degree that cull cow and calf prices do move with dairycow prices the relationships shown would be magnified.

Tax Rate

The profitability of leasing was insensitive to tax rate changes except in those cases where the lessor provided all replacements. When the lessor provides replacements, increases in the tax bracket increased the advantage of purchase. This results primarily from the increased value of the tax shield provided by the costs of replacements and the captial gains treatment of raised animals. Two of the leases were substantially more profitable than purchase when the dairyman has a zero tax rate (table 13).

Table 13. EFFECT OF TAX RATE ON ADVANTAGE OF PURCHASE OVER LEASE Dairy Cow Leases, 1981

Lease Number	Zero Tax and no ITC[a/]	Marginal Tax Bracket			
		0	15	30	45
	(annual after tax advantage of purchase)				
1	$- 68	$- 50	$- 6	$ 36	$ 76
2	72	83	86	85	82
3	353	370	331	290	249
4	64	81	105	128	149
5	221	235	232	229	223
6	-100	- 83	- 34	13	59
7	97	108	110	107	101

a/ Zero tax bracket and no investment tax credit

Two of the leases exhibited results contrary to the generalizations listed above. In both cases, the increase tax shield caused by the very large lease payments offset all other factors. With lease 3, the lease payments tax shield made the lease option more profitable at higher tax rates while other similar leases were unaffected by the tax rate. For lease 5, the increased profitability of the lease at higher tax rates resulting from the tax shield effect offset the opposite trend resulting from other factors. Thus, tax rate had little impact in this case.

Investment Tax Credit

In an earlier study of equipment lease programs (LaDue) it was observed that the ability of the farmer to make use of additional investment tax credit is frequently the determining factor in buy versus lease decisions. However, investment tax credit is less important with the dairy cow lease. Under pre 1981 legislation dairy cattle qualified for limited amounts of investment tax credit because of their short expected life. Under current law, more credit is granted but with normal culling rates a higher proportion of the credit will be recaptured.

Under the extreme assumption that investment tax credit can never be used, the profitability of leasing is modestly improved (table 13). In most cases, however, the added investment tax credit will be usable at some time in the future and will therefore have some value. In that case the purchase option is somewhat more profitable. The sooner it is used, the more effect it has. Actual profitability will fall between the "no investment tax credit" situation and the profitability with the appropriate tax bracket (table 13). The inability to use ITC is most likely to occur in businesses which 1) are unprofitable, 2) have rapid growth rates which limit net cash income and 3) have high levels of investment where investment tax credit available from other investments is expected to continue to exceed any tax liability.

Discount Rate

The profitability of leasing was relatively insensitive to changes in the discount rate. The advantage of the purchase option declined only slightly, about eight percent, as the before tax cost of capital increased from 10 to 16 percent (table 14). Although the cash flow patterns for leasing and purchase are different, they are not sufficiently different that the time pattern of flows has a large effect. The more nearly the terms of the dairyman's loan for purchase of the cows conforms to the period of the lease the less important cash flow timing is. To the degree that a higher discount rate favors leasing, this higher profitability occurs because the major inflow with purchase, the terminal value of the dairy cow, occurs at the end of the period and is discounted heavily.

Table 14, EFFECT OF DISCOUNT RATE ON ADVANTAGE OF PURCHASE OVER LEASE
Dairy Cow Leases, 1981

Lease Number	Before Tax Discount Rate (%)		
	10	13	16
	(annual after tax advantage of purchase)		
1	$ 42	$ 36	$ 31
2	90	85	80
3	295	290	286
4	134	128	123
5	195	191	188
6	19	13	8
7	114	107	100

Interest Rates

Given the high and fluctuating interest rates experienced by the farm community in recent years and the variability in interest rates that individual farmers will likely face in the future, it is frequently useful for farmers to know the level of interest rate required to make leasing break even. To determine this level the leases were evaluated for other interest rates that farmers might face. Only rates under the current New York State criminal rate (25%) were considered.

Table 15. EFFECT OF INTEREST RATE ON THE ADVANTAGE OF PURCHASE OVER LEASE
Dairy Cow Leases, 1981

Lease Number	Interest Rate (%) 16	18	20	22	24
	(annual after tax advantage of purchase)				
1	$ 36	$ 26	$ 14	$ 2	$-10
2	85	73	60	48	34
3	290	280	269	256	244
4	128	118	106	94	82
5	229	217	205	193	180
6	13	2	- 9	-21	-33
7	107	95	82	70	56
Average	121	110	99	86	74

The best leases, from a dairyman's perspective, were only break even alternatives at interest rates of approximately 20 percent. Thus, as a general rule, a typical farmer who can obtain funds at less than 20 percent interest will normally find purchase more profitable than leasing.

During the high interest rate period of 1981 interest rates charged most farmers by the Farm Credit System and many other lenders peaked at less than 18 percent. The rates charged by commercial banks, perhaps the most interest rate sensitive lenders, reached a high of 19.6 percent (Melichar and Balides) for one quarter before starting to decline. Given the uncertainties and complexities involved, leasing does not represent the least expensive method of obtaining control of dairy cows for most dairymen. It appears unlikely that leasing will replace borrowing as the primary source of nonequity capital for dairy cattle investment even if interest rates remain at very high levels.

Break-Even Lease Rates

Given the limited experience with dairy cattle leasing, one method of assessing leasing's potential is to determine the base rate required to make leasing a break-even alternative. The sensitivity of the break-even rate to basic lease rate changes will, of course, depend on the proportion of total lease remuneration made up by the basic monthly or annual rate. For example, leases that require the dairyman to raise animals for the investor have a lower proportion of total lease payments in the basic lease rate.

The leases were divided into two groups, one where the basic lease rate was specified as an absolute amount per cow and a second where it was specified as a percent of cow value. These two groups also break out naturally since those with absolute amount lease rates also provide all replacements and those with a per dollar of value rates require the dairyman to provide all replacements. Break-even absolute rates varied from 18 to 21 dollars per cow per month. (table 16). Break-even rates as a percent of value ranged from 3 to 16 percent. The large range in the latter results from variation in the proportion of total remuneration in forms other than the basic lease rate.

The break-even rates also represent a measure of the tax and owership benefits that the dairyman is giving up if he leases and, thus, indicates how low the rate must get before the farmer is obtaining all of the value of these benefits through a lower lease rate. At least part of the current level of leasing observed likely results from underestimation by farmers of the value of these benefits. Particularly for long term leases, the value of owning the cow at the end of the period is easy to underestimate and is frequently the most important difference between lease and purchase.

Table 16. EFFECT OF LEASE PAYMENT RATE ON ADVANTAGE OF PURCHASE OVER LEASE
Dairy Cow Leases, 1981

Lease Rate Per Cow Per Month	Lease Number[a/] 1	4	6
	(annual after tax advantage of purchase)		
15	$-48	$-23	$-29
20	- 6	19	13
25	36	61	55
30	77	103	97
35	119	145	139
40	162	187	181
Annual Lease Rate as % of Value	**Lease Number[a/] 2**	**3**	**7**
	(annual after tax advantage of purchase)		
15	$ 39	$ 65	$107
20	85	111	152
25	131	157	198
30	176	203	244
35	222	249	289
40	268	296	334

a/ Lease number 5 based payments on percent of milk check

Cash Flow Considerations

One of the reasons for leasing frequently advanced by both lessor and the dairyman is improved cash flow for the dairyman. If a down payment is required for purchase of the animals, it is clear that there could be a cash flow advantage from leasing, at least during the first year.

A comparison of the after tax cash flows for leasing versus purchase for the seven leases evaluated indicates that leasing may or may not provide a cash flow advantage (table 17). When 100 percent of the cost of animals is financed over four years or the duration of the lease (which ever is longer), leasing provides a cash flow advantage in the first year for only three of the seven leases. Investment tax credit and depreciation, particularly on animals culled during the year, limit the first year net after tax cash outflow with purchase. Since the dairyman ends up with the cow at the end of the period when cows are purchased,

total final year cash flows always favor the purchase option. However, for the first 11 months of that final year all of the leases had a cash flow advantage similar to that indicated for the immediately preceeding year.

All leases showed a cash flow advantage during at least one year but only three presented the dairyman with a clear cash flow advantage over most of the lease period. The more profitable the lease is to the dairyman the more likely leasing will provide a cash flow advantage.

Table 17. CASH FLOW IMPACT OF LEASING[a/]
TYPICAL FARM SITUATION
Dairy Cow Leases, 1981

Lease Number	Year 1	2	3	4	5	6	7
	(after tax cash flow advantage with purchase)						
1	$- 93	$-229	$-256	$ 840	$	$	$
2	123	- 17	- 41	- 77	-101	-112	1005
3	246	19	- 11	998			
4	- 1	-137	-164	932			
5	329	46	5	- 38	907		
6	-116	-252	-279	817			
7	62	- 63	4	- 2	- 56	- 67	1156

a/ When 100 percent financing can be obtained and the repayment period on the loan is the maximum of four years or the duration of the lease

Dairymen with a zero tax bracket who are also unable to make use of investment tax credit during the life of the lease are more likely to find that leasing will provide a cash flow advantage (table 18). For this situation, many of the tax advantages of ownership are nullified. A first year cash flow advantage is achieved with all the leases except those with large deposit requirements. Four of the leases provide a cash flow advantage in every month except the last.

Table 18. CASH FLOW IMPACT OF LEASING
ZERO TAX BRACKET[a/]
Dairy Cow Leases, 1981

Lease Number	Year 1	2	3	4	5	6	7
	(after tax cash flow advantage with purchase)						
1	$-336	$-336	$-336	$ 964	$	$	$
2	- 34	- 56	- 56	- 56	- 56	- 56	1222
3	202	73	73	1244			
4	-204	-204	-204	1096			
5	237	- 3	- 3	- 3	1057		
6	-368	-368	-368	923			
7	-121	-121	9	9	9	9	1439

a/ Assumes that investment tax credit is unusable

One of the most important factors influencing whether a cash flow advantage can be achieved is the period over which purchased cows can be financed. For example, consider lease number two which, when the purchased animals are financed over the same period as the lease (seven years), does not show a net cumulative cash flow advantage until well into the fourth year. Although the lease shows some cash flow advantage late in the life of the lease, it is not until year five that any significant cash flow advantage is gained. However, when leasing is compared to a three-year loan (table 19), leasing shows a clear advantage during the first three years. Appropriate assessment of a lease requires that the lease be compared to the term of loan that would actually be used if the cows were purchased. It is frequently easy to illustrate that leasing has a cash flow advantage by selecting a short loan period for the comparison.

Table 19. EFFECT OF LOAN REPAYMENT PERIOD ON CASH FLOWS
Dairy Cow Lease 2, 1981

Repayment Period on Loan	Year						
	1	2	3	4	5	6	7
(year)	(after tax cash flow advantage of purchase)						
7	$123	$- 17	$- 41	$- 77	$-101	$-112	$1005
5	53	- 77	-118	-161	-192	178	1307
3	-156	-295	-347	193	179	178	1307

Evaluating Situations Where Borrowing is not an Alternative

The preceeding analysis does not deal with the situation where the dairyman is unable to borrow the funds required to purchase the cows. For this situation the alternative of purchasing the cows does not exist and the real question is whether leasing the cows is more profitable for the farm business than not having the cows. That is, if the dairyman currently has no cows, will the business be more profitable with leased cows than operating without cows. In some cases, the question is whether dairying is sufficiently profitable to make continuation of the business better than quitting farming and entering another occupation. For dairymen who already have some cows the appropriate question is how much the added cows, obtained through leasing, add to net income.

Evaluating situations where borrowing is not an option will usually require a partial- or whole-farm-budgeting analysis of the particular situation the dairyman faces. Such analyses are not presented in this publication. However, the analyses already presented do provide some ideas that will be important for such analyses. For example, not all leases are alike. Just because one lease is unprofitable does not mean that they all are. Also, because leasing is frequently less profitable than purchase, the dairy business will have to be more profitable to make leasing pay than would be required if the animals were purchased.

Leasing as a Source of Equity Capital for Agriculture

It is clear from the analysis of leasing from the lessor's point of view that leasing can be quite profitable for investors and management companies that serve as the interface between investors and dairymen. This profitability and the current existence of numerous cow leasing firms indicate that considerable nonfarm equity capital could be invested in agriculture through dairy cow leasing if dairymen so desire.

However, analysis of leasing from the dairyman's perspective indicates that with recent interest rates, most dairymen will be better off using borrowed money than leasing. Only farmers with very low marginal tax rates, high replacement costs or very high borrowing costs and those who expect cow prices to decline or who cannot obtain credit are likely to find leasing as a reasonable alternative. Although some increase in leasing is likely to occur as leasing is used in those cases where it is profitable, a large expansion in leasing appears unlikely. Thus, it appears that cow leasing is likely to remain a source of only modest amounts of nonfarm equity capital for agriculture.

Summary and Conclusion

There is considerable variability in the terms and conditions of dairy cow leases currently available to dairymen. The differences in the basic rate paid farmers will likely decline as the cattle leasing industry matures, but the complexity of leases and variability in individual farming situations will likely allow considerable diversity in net costs to the dairyman to continue.

Dairy cow leases can be quite profitable for investors. Leases provide an opportunity for a highly leveraged investment with considerable tax benefits in the form of investment tax credit, depreciation and capital gain income. A high proportion of these benefits occur early in the life of the investment, resulting in net first year after tax inflows that frequently exceed half of the original investment. The high level of tax credits make the after tax return on leases very favorable for high tax rate investors.

Management companies have been developed that will handle the interface between the investor and the dairyman. These companies normally assume little or no financial risk but provide the connecting link between the investor and the dairyman through a standardized lease arrangement that makes it easy for investors to own cows and for dairymen to lease them. Services provided by management companies include legal arrangements, locating and transporting cows, security checks, record keeping and lease termination management.

There are a number of terms and conditions that appear in many leases that dairymen should evaluate carefully. Blanket security agreements covering property in addition to the leased cows, can limit future financing flexibility. Large security deposit requirements can result in first year cash flow strain. Performance standards in some leases would be difficult for many farmers to meet. All culling decisions may be made by the lessor. Calves may be the property of either the investor or the dairyman and the dairyman may be responsible for raising youngstock for the lessor, either at his or her expense or for a predetermined fee.

A discounted cash flow analysis of seven leases available to Northeastern dairymen in 1981 indicates that for typical dairy farm situations purchasing the animals with borrowed funds is economically superior to leasing the cows, if those funds can be borrowed at interest rates less than 20 percent. At higher interest rates some of the leases are able to compete. Dairymen most likely to find leasing to be a good alternative are those who are, 1) in low tax brackets particularly if they cannot use the investment tax in the near future, 2) can obtain a high quality cow for an average lease rate, 3) have high replacement costs (and the lease provides replacements), and 4) expect cow prices to decline over the period of the lease. Inflation in cow prices over the period of the lease can make leasing unprofitable.

Some leases provide a superior cash flow pattern for the dairymen, others do not. A major factor influencing the cash flow advantage of a lease is the period over which cows would be financed if they were purchased. If borrowed capital has to be repaid in two or three years, many leases show a cash flow advantage. However, that advantage frequently disappears if cattle are financed over five or seven years.

Given the apparent advantages of leasing for lessors it appears likely that large amounts of nonfarm equity capital investment could be generated through use of dairy cow lease. However, since only a limited number of dairymen are likely to find leasing to be the best alternative available, it is unlikely that leasing will replace a large proportion of the borrowed capital currently invested in dairy cattle.

References

Aplin, R.D., G.L. Casler and C.P. Francis, Capital Investment Analysis Using Discounted Cash Flows. Grid, Inc. 1977.

LaDue, E.L. Equipment Leasing and Renting as Alternative Sources of Investment Capital for Northeast Farmers. New York's Food and Life Sciences Bulletin no. 67, Cornell University, August 1977.

LaDue, E.L. Economic Evaluation of an Equipment Lease Program. Department of Agricultural Economics Bulletin 79-35, Cornell University, October 1979.

LaDue, E.L. A Procedure for Analyzing Dairy Cow Financial Leases. Department of Agricultural Economics Bulletin 82-22, Cornell University, July 1982.