# POTENTIALS OF COW POOLS

by

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# INTRODUCTION

The cow pool idea is not new. It has been carried on in a large way at the Walker Gordon operation for many years. This will be discussed later in this report. Essentially a cow pool is a milk factory in which cows, owned by many farmers or investors, are housed, fed, and milked in a central location on contract. The pool owner may or may not market the milk, depending on the type of pool.

Pools have developed as a result of dairymen trying to become more efficient, reduce cost of production, increase price received for the product, lack of capital to increase size of operation or to meet cost of changing to Grade A milk, lack of managerial ability to produce Grade A milk, because it is no longer possible for him physically to do the chores involved, and for many other reasons.

The dairy industry is undergoing rapid changes at present. These changes are more rapid than at almost any other time in the history of the industry. In the past year 1,577 producers of Grade C milk in Southeast Kansas, Southwest Missouri, and Northwest Arkansas quit dairying completely (21).

The number of farms selling milk is declining, but sales per farm are increasing so rapidly that total sales have reached a new record high (34). For the country as a whole, the number of farms reporting milk cows declined 19 percent from 1944 to 1950 and an additional 20 percent from 1950 to 1954. Census figures for 1950 and 1955 show a reduction of 22 percent in the number of dairy herds in Iowa with less than 19 cows (26). The number of herds with 20 cows or more increased 34 percent. The number of farms keeping milk cows dropped from 90 percent in 1940 to 72 percent in 1955. From 1950 to 1955,

the number of farmers in Iowa who quit dairying exceeded 30,000. This is three times the decrease in total number of farms in the same period.

In Kansas the number of milk cows has dropped from 723,000 in 1945 to 392,000 in 1958, while production per cow has increased from 4,120 pounds in 1945 to 5,268 pounds in 1958 (29, 30). Here, again, efficiency is shown. Due to increases in production cost, the inefficient producers tend to be eliminated and other producers look for more efficient methods of production and sale of their product.

The number of cows on DHIA Test in Kansas was 7,200 in 1945 and by 1958 the number was 20,487 (28). The production per cow increased about 2,000 pounds per cow over the same period. The dairyman has found it necessary to get on a sounder, more efficient basis in order to stay in business. A large percent of the increase in cow numbers here was due to increased size of herd, as well as the total number of members testing.

Arizona's herd size in 1952 was 60 cow years as compared to 90 cow years for 1957. These figures are for DHIA records which include 46 percent of the dairy cattle in the state (54).

The above seems to indicate larger sized herds of more efficient cows. There are undoubtedly many causes for this increase in herd size. These might be: to become more efficient; to have a large enough operation so that two men are needed, so that the dairyman is not tied to his operation every day and can occasionally have a day off. No other type of farm operation is as confining as is dairying, when carried on as a one-man operation.

The shift to bulk handling of milk with milking parlors and loose housing of cattle has further added to the dilemma of the small herd owner. The desire to get Grade A prices for milk and, thus, increase income without the expense

of high cost equipment and learning the skill necessary to produce Grade A, has caused many farmers to consider the cow pool as a means of remaining in the dairy business.

The pool operation that has received more publicity than probably any other is Fashion Farm in Iowa. Here, again, we find declining cow numbers together with a decline in the number of farms keeping cows.

Since the last world war, dairy farming has become more specialized. There has been a decline of four or five percent of farms keeping cows each year, but only a one percent decline in total numbers in the United States (33). Increased commercialization of dairying has increased marketing of milk. Today, 90 percent of the milk output is sold, as compared to 75 percent in 1920.

The farmer has been encouraged to shift to the sale of milk instead of cream because: first, technological advantages improved facilities to preserve milk, and bulk tank handling of milk allowed increased production volume; secondly, the farmer is finding other farm enterprises more profitable than spending time on small dairying and cream separation; thirdly, of economic advantages such as more money, especially for Grade A milk.

Size and location of the fluid milk consuming population and changes in this size and location have a marked effect on dairy product demand. In the past several years the south, east, and west parts of the United States have had large population increases resulting in increased demand for dairy products in these areas and decreased demand in other areas.

Loss of market outlet for butter has caused a change in some areas, particularly the North Central part of the United States. As a result of this loss of cream market, many dairymen and part-time dairymen have turned

to other types of farming, livestock raising, or more crops. A clincher in the dairyman's decision, however, may have been that dairying is much more confining than most other farm enterprises and, thus, he quit dairying.

Vertical integration has been defined as business where control of two or more stages in the production and distribution process is possessed by a single firm (12).

Integration, efficiency, and large volume are bywords in today's agriculture (42). Integration is more readily adapted to some types of agriculture than others. In agriculture, integration may be regarded as a natural development (7), in a highly competitive, rapidly developing economy. Potentially it can effect savings which can be achieved due to technical developments in production and marketing, reduce risk and increase stability of income, and help provide society with goods at lower prices.

Horizontal integration is the combining of two or more units within the same stage of production, and/or distribution, into a single firm (50). Most cow pools probably fall in this type of integration.

Integration is not new in agriculture. Prior to technological advances there was a self-sufficient agriculture. With technological development, tempo increased and efficiency was gained by allowing off-the-farm business to do a part of the processing. By 1954 the combined operation of our food and fiber economy utilized about 35 percent of our national working force, one-third of which was employed on the farm (17). The investment involved here is greater than the total of all the rest of American industry combined.

The dominant farm pressure for vertical integration in the food and fiber part of our economy is to interlock the farm and business operation to stabilize farm prices. This is brought about by the farmer whose income is low

because he has not adjusted to technological advances. About two to three million farm units are too small to take full advantage of these advances (17). The second reason is that many lack the managerial ability or technical knowledge and capital to make the best use of their present situation. This could mean reorganization of the present farm, adoption of new methods, refinancing, or getting into some other line of business. This last item presents many new problems to farmers, unless they are satisfied to remain on the farm at a subsistence level.

## POSSIBLE CHANGES IN THE DAIRY INDUSTRY RESULTING FROM COW POOLS

These dairy contracts will bring about many changes, some having advantages and some having disadvantages to various groups.

The producer will be able to sell Grade A milk or continue to meet Grade A requirements without investing in bulk tanks or other related expensive equipment, housing changes, or learning the necessary techniques for Grade A production. This will increase the supply of Grade A milk. Small farmers, or farmers usually considered too far from a Grade A market, may sell Grade A milk by participating in a cow pool (24). This will hasten the trend toward one quality of milk for both bottle and manufacturing purposes.

Herd owners short of labor or handicapped, will get relief from the milking responsibility. This, in the case of the owner who is temporarily handicapped, will enable him to maintain his herd until he is again able to take care of the herd (8, 24).

Efficiency of below average herds will be improved by:

1. Elimination of poor cows through use of DHIA records, a necessity for an efficient pool operation.

2. More efficient use of labor through better physical facilities.

3. Better herd management, particularly as related to sanitation, feeding practices, and herd health, and in some cases, improved breeding practices, where the herd was not already using artificial insemination.

Special units to raise calves and heifers, dairy steers, dry and fresh cow units and manure handling facilities will be established. These can all partly be established within the framework of the present pool operation.

Cow pools will create a market for quality roughage and at the same time take away the present market for the farmer's low-quality roughage and pasture unless the farmer can establish one of the units mentioned above.

Milk hauling charges will be reduced through large volume pickup at one stop.

Additional sources of credit will be provided for the dairymen if one considers the use of the pool facilities, but it will make the dairyman a lender of credit in that the owner's return from the pool will be the return from the investment in the cow. The owner's management will have little, if anything, to do with the possible returns on the investment (25).

Cow pools may stabilize the dairy enterprise on small farms by increasing the returns to the owner.

When a dairyman puts his cows in a pool, changes in the operation of his farm will include changes in cropping system and use of buildings and labor, as well as readjustment in caring for herd replacements.

When dairymen put their cows in a cow pool, they pay cash for items such as labor, housing, and feed, which on many family-type farms, can be provided at less cost than in the cow pool. However, labor requirements may be materially reduced in the cow pool as compared to requirements for many private herds.

Plant operators are likely to be attracted to cow pools in areas that have fluctuations in milk supply and are short of milk during part of the year. In addition, quality control can be easily changed on a large volume of milk by supervising only one source. Therefore, a plant in a deficient area may wish to contract for the year around supply, thus replacing some local production.

Market changes may be marked (8). Milk from a large number of herds placed in a cow pool would be more mobile than if scattered on many small farms which would require collection and reloading. Bulk pickup milk usually is not reloaded unless it is being shipped a considerable distance. With a large cow pool, the milk from many herds is already collected and ready for a single loading and hauling operation.

Cow pools may choose to do their own marketing of milk and not feel the need for a cooperative marketing organization (36). They also may be able to bargain for themselves to good advantage.

Associated with the cow pool are the far reaching implications to the present type of farm dairymen. Large, efficient milk production units may result in more milk and a lower milk price. This will certainly squeeze the small dairyman, but widespread and wholesale integration of milk production units with milk processing and distribution systems may do more than squeeze--they may close the Grade A markets now available to relatively small dairymen (8, 35).

If the pool is improperly managed, it will affect many producers and not just one producer. However, many of the first cows placed in the Iowa pool were being handled in what most dairymen would call an improper manner. Less than 20 percent of the original cows placed in the Fashion Farm pool

had DHIA records (9).

Price of good cows would be increased. A poor cow will have an even smaller chance of making a profit in a cow pool than if at home where family labor can be used.

Herd health problems will be intensified. However, with proper management, this should be no problem. Large herd operations in Arizona and California have been able to cope with this problem, and some of these herds are much larger than any present pools (21).

Cow pools would probably not want to support a Federal Milk Order (1). They conceivably might be permitted by a processor to bypass all organized market structures. Premiums and/or other benefits could be passed along to the pool operator.

Cow pools could be a threat to handlers. The handler may need to own a controlling interest in the pool or to have a long term contract. Individual cow pools might be harder to deal with than cooperative bargaining and market associations.

Cow pools use disinterested management and in many cases develop a long way from the market they supply (35).

Some other effects on the market and producer are: the farmer with a contract will be the best risk, because he has a franchise in the best market; as more pools are established, markets may be closed and integrated, the opportunity for innovation and improvements through research will become more difficult, particularly if they threaten to make existing investments obsolete.

Cow pools might be considered an outgrowth of changes in farming caused by modern science and technology. The dairyman finds himself in a squeeze with costs rising and price of milk being reduced. This has caused the dairyman,

especially the small, inefficient operator, the cream producer, and the manufactured milk producer, to look for ways to place his dairy enterprise on a paying basis.

The cow pool may enable him to get a Grade A price, and it may possibly increase the production of the cows. This is very appealing to the producer. Labor shortages have also caused increased interest in getting away from the drudgery of milking twice a day, 365 days a year, with no vacation.

The cost of labor-saving equipment, such as bulk tanks, pipeline milkers, and mechanical feed handling equipment, is another reason for interest in cow pool development.

The dairyman may enter a pool because he is short of labor. The pool may improve efficiency of below-average herds because of better management, improved handling facilities, use of balanced rations, and feeding according to production (24). The pool will need better health and sanitary regulations than are followed on most farms. The pool may have a better breeding program through the use of improved bulls, either artificially or naturally. However, with the widespread use of artificial insemination on small farms today, it is the author's belief that the cow pool environment will cause more increase in production than will the improved breeding program.

The installation of bulk tanks, pipeline milkers, parlor type operations and other labor-saving equipment has continued at a rapid rate on many farms. These costly changes are being made on many farms to provide adequate room for larger herds and to comply with sanitary regulations of Grade A milk.

Many small herd owners dislike the fact that dairying "ties them down" to a regular routine of the milking chore twice daily, every day of the year. This has contributed to herd expansion to a two-man operation in order to

permit some freedom. Some have maintained a small dairy herd to provide a steady income, as well as make use of family labor. The pool theoretically will provide the steady income without the dairyman being "tied down" to the chores.

Originally, the money-making excitement generated by cow pools stemmed from the marketing, rather than the production efficiency phenomenon. Most of the reported income advantage to dairymen in the Fashion Farm pool were due to a shift from manufacturing milk or cream price to Grade A price (8).

It is true that the use of the cow pool will permit a farmer to enter the Grade A market without remodeling his building, or buying bulk tanks or can coolers. The farmer does not even have to learn the necessary skills to produce Grade A milk. Many farmers milk so few cows that it would not pay them to invest in the necessary equipment required for Grade A production.

According to Arnold, current data available indicate large dairymen cannot reduce costs of producing milk greatly, if at all, through the use of cow pool facilities (8).

## POOLS NOW IN OPERATION

### The Walker Gordon Operation

The Walker Gordon farm was established in 1891 at Plainview, New Jersey, by two New York City physicians who were interested in obtaining a better milk supply. This farm has produced certified milk for many years. The services rendered by Walker Gordon are many (10). It provides a centrally located stall barn where each owner can house, care for, and manage his own cows. Walker Gordon furnishes feed to the owners, milks the cows, and specifies rigid requirements as to health and sanitation, which owners must follow in

the management of their herds. In 1958 Walker Gordon purchased all the milk for about six cents a quart. The milk is processed and sold as certified milk. The owner must remove dry cows and must keep his barn 95 percent full of cows at all times. Each barn houses 50 cows. One thousand six hundred and fifty cows are milked on a rotalactor, which makes one revolution every 12 minutes. In 1936 when the author visited the farm, eight men washed, used the strip cup, watched the milking machines, and machine stripped the cows. One man was a relief man, and the eight men worked an eight hour shift. At that time, 1,650 cows were being milked three times daily in less than seven hours for each shift.

Most of the roughage fed at Walker Gordon is produced on land owned by them, which is cash-rented to crop farmers for $15 per acre. Some of the green chopped grass is dehydrated for dry hay in Walker Gordon's own dehydrater, which is also used to dehydrate manure which is sold as garden fertilizer.

## Fashion Farm

This farm is operated by Carroll Morris. It is located in northwest Iowa near Meservey and started operation in August, 1958 (41). Initially, this pool made contracts with dairy farmers, whereby the pool milked, fed, bred (owner could specify bull to be used), and did all of the work connected with taking care of the cows. For a fee, the cow could be kept during the dry period. Veterinarian charges, feed costs, electricity, miscellaneous cost, $30 per year building fee, and management and labor fees were deducted each month from the income produced as calculated by the cow's DHIA record, with the profit going to the owner or his being charged for the deficit.

When the author visited this farm the first part of September, 1959, the cow owners had changed so that 90 percent of the present owners are eastern investors. In many cases, the farmer owner sold his cows and remaining contract to these investors. This pool has a 1,000 cow capacity at present.

This farm is located on a rather flat area of very good northern Iowa farm land. Land in this area normally sells for $400 per acre or more. A four-inch rain occurred the day before the author visited this farm in September, 1959. This left the ground area of the lots very muddy, and a lot of mud had been carried up on the concreted area of the lots. The hospital barn had been recently cleaned of manure and was full of water. This barn construction was completed in May, 1959 (41).

The cows are penned in groups of 100, according to production of the cow, irrespective of the owner. The milk is all milked into a bulk tank, with each owner being credited with milk according to the one-day DHIA test.

## Modern Dairy Farm

This farm is operated by Herbert Freel, southwest of Ft. Madison, Iowa. It started operation in July, 1959. It is located on a well-drained, sandy soil about two miles from the Mississippi River. Mr. Freel calls his operation a "cowtell". At present this operation has a capacity of 600 cows, but it is so planned that he could double the size very easily (22).

Here the cows are brought in on a contract, but the pool also owns cows. The cows brought in on contract are milked, fed, bred, and cared for. The owner must contract for a pen which will hold from 25 to 30 cows. Mr. Freel screens the cows coming into the pool for production, as well as for health. If he feels that the herd does not have potential to produce 10,000 pounds of

milk, he does not want the cows.

The lots are all surfaced with concrete. There are areas along the fence and back of the loafing sheds that are not concreted. According to Mr. Freel this is to help get rid of surface water. According to local information at Modern Dairy, a nine-inch rain fell before the author visited the farm. No signs of standing water were seen any place, although some of the unfinished sheds showed signs that water had run through them. The sandy soil and unconcreted areas apparently took care of the water.

Each pen is equipped with an automatic waterer that will not freeze. Between every two pens is an uncovered area, 32 feet by 56 feet, around which the cows in these pens are fed hay. Mr. Freel states that when it rains, he feeds off the top of the pile. He has had no trouble with spoiled hay. The cow sheds are 40 feet deep, with the back eight feet used for bedding storage. The lower two feet of the back of each barn is not sided, because the bedding is placed here. This reduced cost of the pole-type shed, as well as helping with ventilation if needed. Large doors are placed at the fence line between every two pens. Manure can be removed via this route when necessary.

Cows are milked in two milk parlors; each is four-stall side-opening. Cows are held in a covered holding area, where fog spray for flies is used. Each herd's milk is put in a bulk tank, where it is cooled immediately. When the herd is milked, the milk from the herd is measured and a sample taken. The milk is then pumped into a tank truck. Each owner is paid for the milk that his herd actually produces.

The contract calls for each owner to pay $150 per year to cover all costs, such as building, electricity, management, gas, and similar costs.

He is also charged for feed, bedding, breeding, and veterinary expenses. The farmer or owner of the cows may furnish hay and bedding for his cows, if he wishes. All grain is purchased by contract from a local elevator, using a feed formula dictated by the pool.

When the author visited this farm, 100 cows were being milked, and another 100 dry cows that were about ready to freshen were being cared for. Cows are cared for at no extra labor cost during the dry period. A hospital barn 60 by 75 feet, with boxstalls for calving, and other facilities to care for sick cows, is centrally located. Calves are raised for the owner by contract with a local farmer.

According to Mr. Freel, one of his big problems is getting good-quality hay. Hay is now tested for protein before it is purchased.

## Michigan Cow Pool

This pool started operation in 1959 (5). It is owned and operated by two brothers in connection with the Dean Milk Company owned by one of the brothers, Jack Dean. The pool is managed by Dick Dean.

The Deans wanted to protect their present large investment in a dairy farm of 325 acres and also provide a reliable supply of milk to the Dean Milk Company. This operation is located in a fruit growing area of Michigan, where the numerous fruit growers do a small amount of dairying on the side.

This pool will apparently have a better price situation than the Fashion Farm pool. The Dean Company paid an average of $4.39 per hundred pounds for milk from April, 1958, to March, 1959, compared to an expected $4 per hundred pounds at Fashion Farm. Also, the Dean pool is located only 1.5 miles from their market, compared to over 250 miles for Fashion Farm.

The farm plans to expand the cow numbers in order to get in line with demands of the milk plant. This would appear to be a means to a completely integrated dairy setup. If the pooled operation works well, undoubtedly the brothers will, as financing becomes available, make it a large-scale dairy operation, rather than a pool.

## The Neosho Valley Cow Pool Association

This pool is located at Erie, Kansas, and operation started September 9, 1959. It is a cooperative pool, financed jointly by Consumers' Cooperative Association, the Neosho Valley Cooperative Creamery, and the Wichita Bank for Cooperatives. This pool has nine parallel pens 120 by 255 feet in dimension. The pens are connected by a concrete alley on the east, and they have a concrete feed manger on the west. The pens are unpaved, except for a 12-foot concrete apron at the manger, in front of the sheds, and around the water tank, which is in the fence line between every other pen. The sheds are 40 by 60 feet with the back eight feet provided for bedding storage.

These pens are designed for 30 cows. At present, cows are being separated in pens according to breed. The cows are taken to the holding pens, which are open. Cows are milked, and four times each month milk is weighed and tested. Owners are paid on the basis of this record. Milk is all put in a bulk tank, and it is sold to the Neosho Valley Cooperative Creamery.

The cows are under contracts that call for the owner paying a $25 membership fee plus $30 per cow, building, and equipment charge. He, also, must pay a prorated cost of labor, electricity, and similar costs. He also pays for breeding, feed, and veterinary costs.

## Utah Cooperative Milk Barns

These Utah pool operations are much different from the other pools, in that they are cooperatives, and one pool may not perform the same services as another (10). They are located mainly in central and southern Utah, with known cooperative milking barns operating in Minersville, Beaver, New Castle, Veyo, Hurricane, Circleville, and Monroe, Utah. There are still others in the state that are family farm partnerships (44).

Three methods of handling the cows may be found in these pool operations.

1. The cows are all housed and fed at the owner's place. They are driven to a central milking barn where the owner washes and prepares the cows for milking. After milking he drives the cows back home. Milking time-schedules are maintained and rotated monthly or semi-monthly. Some herds are driven nearly a mile, while others are very close to the milk barn.

In this type, the owners have only the additional cost of a Grade A barn and milk house, together with the adjoining lots, to finance.

2. The cows are all held at a central location, where each owner is allotted a plot of ground, owned by the cooperative, to erect corrals and open-front sheds. With this system, all cows are only a short distance from the holding pen at the milk barn. The producer or owner must build and maintain the fences and buildings, as well as to clean them. The cooperative generally hires the milking done. In some cases, a rotational milking schedule is followed. This practice is not so important in this type of operation.

3. The third type of setup is a combination of the first two in various degrees. The cows may or may not be housed on land owned by the cooperative. Some of the cows are driven to and from the milk barn. In this case, a

rotational milking schedule is necessary.

All of the above methods feed a standard amount of grain to the cows at milking time. The owner may, if he wishes, feed additional feed.

At present, no herds are on DHIA testing or any other type of testing. Each herd's production is weighed, and in some cases, it is sampled for a butterfat test.

The cooperative milking barns are financed in a number of ways. In some cases, the total cost is assessed on a stock basis, and each producer shares in the operating cost, whether or not his stock is used to capacity. In some cases, the cost is assessed on a per pound of milk basis. This has a tendency to assess on the ability-to-pay principle. In other cases, the cost is assessed on a pound of milk basis for operating expenses, such as labor, power, feed, supplies, and water, while special assessments are made on a stock basis for expenses such as improvements, equipment, repairs, and taxes.

Base setting is handled in a number of ways and it is of much concern to the expansion of the operation. In some units, the base is allotted to the cooperative. In other units, the base is allotted to each producer. Where the base has been allotted to the unit, there is no incentive or opportunity for individual producers to increase their size of operation. Directors are almost forced to insist that each producer continue his original status.

Where Grade A base is owned individually, the operator may not acquire more base, unless at the same time, he could acquire more stock in the milk barn.

## Arizona Pool Operation

This pool started as a result of high tax rates and the city of Tucson's ever expanding size (3). Four dairymen, all affected by the same problem, decided, at the suggestion of one Gordon Stephenson, to pool their present resources in the move.

In this setup, Mr. Stephenson operates the pool and charges forty-five cents per day per cow for grain and the use of the milkers. This is set high, but a plan has been worked out to refund the surplus on a percentage basis.

Each of the four owners does his own roughage feeding and herd management to suit himself. The pens are pie shaped and radiate from a herringbone milk parlor at the hub. These pens were financed on the basis of pens needed for each man. They have financed the milk barn together, and they have also built a hospital barn and purchased a stand-by generator in case of power failure.

Since each man had his individual bulk tank, these were set up in the new milk house so that each producer could keep his milk separate. They received an unexpected bonus in a reduction in milk hualing price, because of the large volume of milk at the one place.

## India's Pool Operation

There are many reasons for organizing a cow pool (2, 11, 19). India has used the pool idea to rid the city of Bombay of cows and water buffalo, and at the same time, to increase the milk supply. With this idea in mind, the Indian Government set up an operation north of Bombay called an "Aarey". Cattle were outlawed in the city of Bombay after this operation was set up. This, of course, meant that the Aarey was filled with buffalo.

This organization takes over the entire management of the cow, as well as the raising of the young. For a fee, the government milks, cares for the cow, her offspring, and markets the milk through government owned processing plants. Through proper feeding and management, the production of the buffalo has been increased 50 percent. The cattle are sheltered from the rain, and all cattle are dry-lot fed during their lactation period, then placed on pasture during the dry period.

The owners of the cattle are paid twice a year for their milk. This method involves a lot of bookkeeping and other records to keep each owner listed, as well as to keep the offspring from his animals accounted for. The females are raised and bred through the Aarey management and placed in the Aarey when they have freshened.

The cows are fed peanut oil meal, rice bran, rice sweepings, corn (maize), and soiling is practiced. The young stock are raised on other farms. The problem of disease is a big one, since the animals cannot be killed even if diseased. Such animals are turned out in pastures with very little, if anything, to graze on, and allowed to starve, or they are placed in pastures subject to raids by predatory animals (19).

## Other Pool Operations

Many other pool operations have been tentatively planned, however, to date (November, 1959) the existing pools in the United States have all been discussed.

A pool operation in Ohio was started to the extent that a preliminary draft of a contract was made. This contract was similar to other contracts. To the author's knowledge, this pool never got into production.

## COW POOLS AND LARGE DAIRY OPERATIONS

Large milking herds permit a good manager to do his best (39). There is no place in either a cow pool or a large-scale dairy operation for anything but top-notch management for a single ownership dairy.

The cow pool will likely have more disease problems than will the large dairy. Management, if successful, will find the answer to this problem. One might ask, "Why would a cow pool have more disease problems than the large dairy which purchases replacements and merely keeps the cow through one lactation?" The answer here might lie in the fact that most of these replacements are purchased through established market channels which have largely worked out the health problem to the satisfaction of the dairyman. The pool operator will be getting herds from many farms and cows in varying stages of lactation. The large dairy usually likes to purchase the cow before calving and bring her to the dairy operation to get the cow acclimated.

To date, most of the large-scale commercial dairy herds are located in warm climates, such as California, Arizona, and Florida. These areas, at present, seem to have very little interest in cow pools, possibly because most of the milk is sold as Grade A. These large dairies have a higher than average return for their milk, with California receiving $5.25 per hundred (6).

Norwood's Incorporated, a gallon jug cash-and-carry store, started the large-scale (45), large-volume approach to dairying in Massachusetts, using similar methods as those used in Florida and Arizona, except to adapt the buildings to Massachusetts weather conditions. In 1957 this firm milked 425 cows, and it expects to raise the number to 1,000.

Cows are dry-lot fed in concrete pens of 40 cows each. Three men milk 400 cows every eight hours. This operation milks cows one lactation, sells

them for hamburger when production falls to 25 pounds, and replaces the cows. According to figures available (45), the firm gets two months more production per cow than if they raised their own calves. Also, they would need facilities to take care of 80 additional cows to get their present production.

In most respects, cow pool operations and large-scale dairy operations will be very similar. Most pool operations will have cold weather and heavy rainfall to consider, which does not bother the Arizona and California producers. The average rainfall in Iowa is 30 to 35 inches annually, and temperatures of zero are common (6). Also snowfall presents many problems. The 1958 rainfall in southeast Kansas was 40.65 inches compared to ten inches for California and Arizona (30, 54). These facts will present many problems for the pool operation.

Are pools more efficient? Most present pool interest is based on market price differentiation, which the large dairy already has. If pools and large dairies become more prevalent, opportunities to shift manufacturing milk into Grade A outlets will be reduced or disappear completely (50). If this should happen, present pool operation and large-scale dairying, as well as all dairying, would be on a production efficiency, rather than a market basis.

The production efficiency of cow pools as compared to large dairy farm operation has not, as yet, been determined. It appears that the cow pool arrangement can produce milk with considerably less physical facilities and cost than can the small dairy operation.

Physical efficiencies are only slightly greater than those of large, efficient dairymen. Thus, the prices paid for labor and other expense items in a cow pool could possibly be enough higher to offset the physical efficiencies. Saying it another way, many producers do not value their labor

or managerial skills as highly as the price paid in a pool.

Farm records summarized at Michigan State University indicate that well-adjusted dairy farms with 60 to 80 cows produce milk about as efficiently as the estimates that are made for large cow pools (10).

A large-scale dairy enterprise, regardless of whether it is privately owned or a pool, will need to pay close attention to operational details. Many operational details that a small dairyman handles in stride may be a major problem in a large operation (10).

These operational details should receive considerable attention:

1. Developing a physical plant and work routine to allow high labor efficiency.

2. Developing a sound record-keeping system for health, breeding, production, and culling.

3. Developing a system of sanitation including getting rid of a large volume of manure.

4. Developing a system of mass feeding of cows that is efficient nutrition-wise and labor-wise, as well as economical.

5. Developing a sound labor policy that will cause labor to want to assume responsibility for doing their work in an efficient way.

## OPERATIONAL STRUCTURES OF THE COW POOL

Proper design, location, and general layout of the dairy facilities for handling large numbers of cows is very important, if a cow pool is to be operated efficiently. Easy handling of cows can be facilitated by location of gates and general traffic movement of the cows. Cow pools may have a big advantage over individual farms in labor saved. If the most labor possible

is saved, considerable attention should be given plant layout, as correlated to herd size, and labor requirements per cow.

## Location of the Pool

Some further considerations are listed below. Listing of the items is not necessarily in the order of their importance.

1. Locate in an area where Grade C milk is now being sold and within hauling distance of a Grade A market. What is "within hauling distance"? Fashion Farm hauls its milk 250 miles to a Kansas City market. Modern Dairy hauls its milk 140 miles to St. Louis. Neosho Valley Cooperative hauls its milk 1.5 miles to Erie, Kansas. Milk in a bulk tank becomes very mobile.

2. A well drained location for the barn layout with good access to a dependable road is desirable.

Modern Dairy is located on a very sandy tract of land that gives excellent drainage. This place is also sandy enough that manure may be hauled from the lots right after a rain.

3. Locate near a good dependable source of roughage. Large tonnages of good-quality alfalfa hay should be available. If pelleted hay becomes available at prices comparable to baled hay, one would need to consider proximity to a dehydrating and/or pelleting plant.

It may be desirable to locate near land capable of producing large tonnages of silage. If the silage is to be hauled very far this cost will be prohibitive because of the high moisture content of the silage compared to dry hay. Green chopped feeds might be another consideration. Here, again, distance of hauling would need to be kept short because of the high moisture content of the green chop.

4. Locate far enough from any town or city to insure long-time operation at that location in an area not subject to city control or taxes.

5. The number of cows in the area should be sufficient to assure capacity, or near capacity, operation of the pool at all times.

6. Plenty of labor must be available. This labor will need to be skilled or a period of training will need to be provided if experienced help cannot be found.

7. An adequate water supply is essential (54). Total water need can be figured at 40 to 50 gallons per mature cow equivalent per day for drinking and cleaning. Pump capacity must be sufficient for peak use; 50 gallons per minute at 40 to 60 pounds pressure per square inch is recommended for 100 to 240 milking cow herds. Water must be free from objectionable tastes and odors.

8. Enough acreage should be available to allow the operation a place to stock pile manure if no other method of disposition is available.

## Breed and Production

A large volume of milk per cow will be needed. Also there are some advantages in favor of the lower testing breeds due to butterfat test differentials. If a special single breed market is available, this milk would need to sell at a premium to offset higher labor cost per pound of milk.

The average cow in Kansas produced 5,268 pounds of milk in 1958 (30). The average cow in Kansas DHIA produced an average of 9,616 pounds of milk in 1958 (31). Cows in Kansas Dairy Herd Improvement Associations are predominately Holstein. A low milk producing cow in a pool will have even less chance of making a profit than she would on the farm because of higher fixed cost in the pool.

About 90 percent of the DHIA producers are selling Grade A milk (31). This being the case, one must assume that many of the cow owners interested in pool operation would have cows producing an average of less than 5,268 pounds of milk in Kansas under the farm conditions. It is possible that better management in the pool may increase this production one-half or more. Some large-scale dairy operations have over 10,000 pound milk averages and buy all of their replacements. Pool operations could use this as a starting goal.

## Herd Size and Capital Requirements

The optimum sized herd will depend on a number of considerations, such as market requirements, labor available, design of operation, labor-saving equipment, type of management used, and since efficiency is a must in pool operation, one should consider unit efficiency.

A herd of 100 cows requires five hours labor per 1,000 pounds of milk with smaller herds requiring more labor per unit of production (24).

One man should be able to milk from 200 to 250 cows per eight hour shift. There is no evidence to indicate that any one size herd is the most efficient (31). There will be herd sizes that are most efficient if one figures the use of only one, two, or any given number of milkers; that is, if one milker can milk an average of 30 cows an hour, two milkers, 60 cows an hour, etc. One must coordinate all the operations, feeding, milking, cleaning up, and management.

If a full-time manager is to be hired, one will need to reduce managerial costs by increasing cow numbers. One manager should be able to handle 800 to 2,000 cows (24). In the case of smaller units the manager will need to be

one of the workers.

## Areas of Integration

There are many different ways dairying may integrate in pool operations. Both horizontal and vertical integration may be accomplished in the activities of the pool. If a pool were to integrate completely from the standpoint of all the possible angles, it would result in quite an extensive operation.

Integration is nothing new to farmers today, but the interest is becoming more widespread (49). Groups other than farmers, such as feed companies and grocery retailers, are becoming interested in integration. It is now possible for integration to take place at a much more rapid pace than in the past, because today companies, national in scope, can conceivably, through contract, obtain rather complete integration between several phases of production, processing, or marketing, without the usual time lag and fund accumulation needed for acquiring ownership of the facility. Some areas of integration might include (24):

1. Marketing alternatives for milk. The pool might operate as a function of an established milk marketing organization such as a cooperative producer's organization. Because of the volume of milk the pool will have, it may not feel that the cost so involved is worth this method of marketing. The pool might contract to furnish the processor with a certain amount of milk of a given quality at all seasons of the year, thereby allowing the processor to even out his employment and work load throughout the year. This could lead to a premium for the pool milk because of reduced hauling cost, reduced cost of quality-check necessary, and a uniform supply of milk. This sort of arrangement would need to have a very tight contract, because

it could leave the processor without milk, if the pool received a better bid for its milk. The pool operator could demand a higher price for its milk or the processor could find a cheaper source of milk and, thus, leave the pool with no market.

Another method of marketing would be for the pool to process the milk and distribute it directly to the consumer. This could be the most common path taken by pools and is the method used by many large-scale dairy operations in California where the milk may be retailed within 100 feet of where it is milked (31).

2. Feed. Perhaps just as important as the marketing of the milk would be the integration of the feed supply which could have one or all of the following stages of vertical integration involved. The pool could:

a. Buy all the feed. This will probably be the method used by most pools when they first start operation, or it may be combined with number two.

b. Produce some, or all, of the roughage and buy some of the roughage and grain. In the past several years it has been possible to purchase grain cheaper than to raise it, if it is purchased at harvest time.

c. Buy bulk-prepared mixes. This would greatly reduce costs of investments for the pool as well as reduce capital outlay for the year's supply of grain at harvest time, if grain is to be purchased at the usual low time.

d. Have facilities to handle green forage such as silos, and a pellet mill and drier. The drier could be used, as is done at Walker Gordon, to handle the manure disposal problem. Here, the manure is

dried, bagged and sold in New York City for fertilizer for lawns. In the summer, the drier is used to dry hay.

3. Dry cow and freshening cow management. This conceivably could take several forms. The cows could be returned to the owner's farm to be cared for until they have freshened again.

The cows could be cared for in separate lots at the pool with additional feed and labor and housing costs to the owner.

4. Replacement raising. Calves and heifers could be handled in the same manner as the dry cows, that is, on the owner's farm, in lots at the pool, or on a separate pool setup.

## ORGANIZATIONAL PROBLEMS

The organizing of a cow pool will present most of the same problems as the organization of any new business, plus a few that are peculiar to only a cow pool. These problems will include finances, other competition, legal problems peculiar to the state in which organization takes place, and, of course, many other considerations such as size, extent of mechanization, etc. (24).

### Financial

Banks are working closely with contractors and integrators. Loans are becoming more complex and tend to be larger. Loan risk will be spread and repayment will be more easily determined (51). Banks will be one of the sources of capital. However, considerable planning should be done before one decides the type of financing best suited for the particular pool.

Some of the problems that should be answered before financing is sought

are:

1. Design of the pool layout. Have the plans checked for sound, efficient operation for both movement of cattle and feed.

2. Building construction and cost. Present shed construction costs range from 75 cents per square foot (10) to $1.25 per square foot (21). The author has seen both types of sheds and it would appear the lower priced sheds would be the warmer in the winter and cooler in the summer. Aluminum roofing was used on this building.

3. Financing from private individuals or businessmen. If pools prove profitable, this will undoubtedly be a good source of capital. This source would also include feed companies, equipment companies, and insurance companies.

If the pool is to operate on the basis of charging from $30 to $40 per year per cow for building depreciation, $30,000 to $40,000 of the necessary capital could be raised by signing up, in the case of a 1,000-cow pool, 1,000 cows in advance. This was done in the case of Fashion Farm with the money being held in escrow until a certain date for the pool to start operation.

If the pool is to be operated as a cooperative, as is the case of the Neosho Valley cow pool, cooperative sources of money could, and did, become available for their financing. These sources could be various local cooperative enterprises, Consumers' Cooperative, and Wichita Bank for Cooperatives.

One could logically expect to find a combination of one or more of the above methods of financing.

## Competition

The cow pool is set up to make a profit for the farmer as well as a profit for the pool management, except possibly in the case of the cooperative pool (20). If the pool is set up as a part of the operation of a feed business, or some other industry interested in dairying, conceivably the pool could operate at a slight loss, if this operation improved the bargaining position, feed business, or milk distributor enough to overcome cow pool losses (24). This type of operation might be economically sound for a time. However, it is doubtful if it is economically sound to operate a business over a long perioc at a loss. This advantage of owning and operating the pool could also spread to other distributors, who, in turn, would make the market more competitive.

Can a pool operate more efficiently than an efficiently operated small dairy? In some areas of the operation, it is undoubtedly more efficient, especially in cost of milking barn and milk handling equipment, as well as some other equipment. However, in the field of labor economies it is very questionable if pools have an economic edge. Also since at present most of the cows going into pool operations are untested for production, pool operations may be trying to be successful with lower producing cows. Modern Dairy is trying to screen the cows entering this pool at 10,000 pounds of milk (22).

A conflict of interests exists between the unorganized producer and other segments of the marketing structure. As a result, producer-processing cooperatives, Federal Order Milk Markets, and producer bargaining associations have developed. Cow pools cannot ignore the long-run interests and objectives of these dominant organizations that are extremely import in large Grade A markets.

Under given demand conditions, over-all prices are determined mainly

by total milk supplies. Thus, one may conclude that successful vertical integration offers a partial solution to the price problem of some farmers, but does little to solve the over-all price problem of all dairymen. Should the additional milk brought into any one marketing area by a pool operation increase the total supply enough to cause a surplus, the pool might depress the price to the extent that returns to the farmer would be no better than Class Two milk. There is little to indicate, at the present, that cow pools can operate at a profit on the basis of Class Two milk.

## Legal Problems

The legal problems will vary in different states. In most states, a business can be organized as an individual proprietorship, partnership, or as a corporation. In Kansas, there appears no difficulty in operating a cow pool under individual ownership or partnership arrangements. There seem to be two limiting factors to this type of arrangement. First, the shortage of capital, and secondly, the much greater liability the individual or partnership is subjected to when compared to the corporation.

For many years Kansas has had a statute prohibiting certain types of farming operations including milking of cows (24). An Annotated Summary from the General Statutes of Kansas, 1935, Chapter 17, Article 2, 17-202a follows:

> Certain Agricultural, Horticultural, and Dairy Corporations Prohibited. That no Kansas Corporation shall be granted a charter and no foreign corporation shall be given permission to do business in Kansas which Kansas or foreign corporation purposes to or will engage in the agricultural or horticultural business of producing, planting, raising, harvesting, or gathering wheat, corn, barley, oats, rye or potatoes, or the milking of cows for dairy purposes. (L. 1931, Chapter 153 1; March 9).

Legal advice should be sought for each state. It is the opinion of many independent dairy plants in Kansas that this statute prohibits them from

forming cow pools as corporations in Kansas.

In Kansas, cooperatives may be organized in three major ways: they may be incorporated under the general corporation laws of the State, the Kansas Cooperative Marketing Act, or the Kansas Cooperative Societies Act. The most successful cooperatives are organized under the Kansas Cooperative Marketing Act. Cooperative milk pools may be incorporated, if they include provisions meeting the requirements of the Capper-Volstead Act, according to some authorities (24). The title of milk cows must remain in the hands of agricultural producers.

Legal barriers could limit pool growth (35). For example, health departments having jurisdiction in some consuming areas might present obstacles.

## Other Considerations

Midwest dairymen do not use as much borrowed capital in their operations as other types of livestock producers (24). This is probably due to reluctance of dairymen to borrow money and also reluctance on the part of some lending agencies to make dairy loans. Pool operations could mean greater amounts of capital available to dairymen and better use of that capital which is available. Dairymen reluctant to invest large sums of money in their own costly equipment, may readily invest a smaller amount of capital in a cow pool. One must also consider that renters, in many cases, do not have the opportunity to make such on-the-farm investments and landlords may not want to make such investments.

Provisions should be made for the sale of livestock, as well as the remainder of the contract, to other parties, if the farmer wishes to quit dairying. This is what has happened to a large degree in the Fashion Farm

setup. Investor money was provided to buy this stock and contract.

At the present time there are strong pressures for the development of large-scale firms throughout the dairy industry. Proprietary and cooperative forms of business are proceeding to integrate through mergers at a rapid rate. This trend should not be ignored by anyone seriously considering a business venture involving financial resources as large as those in a cow pool.

Stability of the market for the pool's milk should be considered. A pool will, of necessity, have to operate at near capacity at all times to be most efficient. This will mean that the best market available should be sought and that contracts should be for a long period of time.

## WHO IS INTERESTED IN COW POOL DEVELOPMENT?

In making contracts, business interest will not always consider the optimum economic interest of the farmer and may require production in the case of milk at a more or less uniform rate (40).

Allied industries will find serious implications in the development of cow pools and other large milking operations. Feed companies, for instance, might view the development with favor due to the possibility it offers for reduced sales and delivery costs and a more stable feed outlet. Dairy equipment sales companies might view the development with alarm, since a drastic reduction in the number of farms milking cows reduces sales opportunities. A few large milking operations cannot offer as great an over-all sales volume to the equipment industry as a large number of individual dairy farms.

## The Dairyman

It appears now that farmers or dairymen who will be most interested in placing cows in a cow pool are those who most nearly fit the following specifications:

1. The producer of manufactured milk and cream. This is by far the greatest attraction to cow pools in Kansas and Iowa. The switch from Grade C to Grade A with no cost for improved milking facilities, milk handling facilities, or additional work. However, if the quantity of Grade A milk increases too much, the Grade A blend price will fall, and the attraction will diminish (49).

2. The dairyman with a small herd where the dairy enterprise is a relatively unimportant part of the total farm business. Farmers with a few cows, managed and milked solely by the wife and children, probably will not be interested. Owners of large herds that already have the advantage of Grade A probably will not be interested either, because they already have their investment in equipment, machinery, and skill to meet Grade A requirements. If they are large enough, they can also obtain similar discounts on feed and supplies.

3. A few farmers who have capital to invest and may want to put cows in a pool. Also a few farmers will be satisfied to put cows in a pool because of the added leisure it will give them.

4. The herd owner is a widow or an old farmer who would like to keep the herd together for some reason. The farmer who is short on labor or wants to retire or reduce his work load, but still stay in the dairy business. This farmer would probably want to raise his calves and keep his dry cows at home.

5. Young farmers and part-time farmers trying to get a toe-hold in farming, who cannot raise adequate capital for an economical dairy enterprise may be interested in the cow pool. The Grade A producer, who is rather small in size, and has experienced difficulty with quality and marketing may also be interested.

### The Manufacturer, Processor, and Feed Companies

If one accepts that integration can have many degrees of coordination, one knows its application will take on different forms for the contractor of a feed supply and the contractor who has a more completely integrated arrangement where supplies, production, processing, and retailing all have a centralized management (13). The more complete the integration, the more emphasis there is placed on producing to specifications.

Milk dealers have so far remained in the background in pool development (35). However, if pools prove profitable, many market milk operations will be tempted to invest in the production end of the dairy business. Ungraded milk markets are uneasy because of loss of milk.

A feed manufacturing firm may have interests in cow pool development. They have in the past had a marked interest in poultry and swine production integrated operations. This type of interest could range from a contract to furnish feed to owning a major share in the production and marketing facilities.

It would seem that cooperatives would be one of the most logical places for cow pool interest. This would fit in well with existing cooperative processing facilities, as well as existing feed manufacturing facilities. Most cooperative milk processing plants in Kansas were organized originally as cream handling facilities, and the most successful ones have kept pace

with the changing dairy industry by adding facilities to handle manufacturing milk and then Grade A milk. It would seem that these same successful cooperatives would then need to be especially alert to the possibility of cow pools. This is shown by the organization of the Neosho Valley Cooperative Cow Pool by three interested organizations of the cooperative movement.

Where producer bargaining associations are strong, it is possible that they would organize and develop cow pools. This would keep control of bargaining in the market for the producer organization. Historic evidence for the dairy industry would suggest that the trend is definitely toward a smaller number of organizations involved in the marketing process (24).

## The Food Retailer or Distributor

Supermarkets have expanded greatly during the past decade in the United States. These stores market large quantities of agricultural products of uniform quality (46).

M. J. Thomas, agricultural counsel for the Kroger Company, in a discussion of vertical integration, pointed out problems that face supermarkets in a paper presented at the eighth annual meeting of the National Institute of Animal Agriculture held at Purdue University (53).

> As a food retailer, our job is to sell food. We believe we are specialists in this field. But to sell food and provide values, we must have products available in quantity, of uniform quality, and from a dependable source of supply. This is the only way we can satisfy our Boss, Mrs. Consumer. When one of these three prime requirements is not met, we think of integrating our operations.

Mr. Thomas might well have added, "at the lowest possible price". The competition among supermarkets, in price as well as quality, has forced efficiency.

In the manufacturer's ever looking around to reduce the cost of his

finished product, the raw material is one of the easiest places to make this reduction (18), because many of the farmers' costs are hidden and can be put off or minimized. The farmer can sell the fertility of his soil without restoration for a long period. The farmer can call upon his family for labor without cash payments. Repairs and replacements of buildings can be delayed. Depreciation is seldom, if ever, counted as a part of cost.

### The Investor

Anyone with money to invest is always looking for a safe place to invest that will give the highest return possible on the investment. Should cow pools prove profitable, this could open a new source of capital to the dairy industry. However, if pools should become numerous enough to over-supply the Grade A market, the price of milk would be reduced, profits would decrease or disappear, and, of course, this would remove these investors from interest in cow pools.

## EFFECT ON DAIRYMEN FURNISHING THE COWS

Where and how cow pools might fit into a farm operation may depend on the combination of production now in use (32). The manner in which this combination might be changed should be considered. To go into a cow pool may resolve into economic considerations, personal preference and desire, and it will remain as long as a farmer can economically afford to operate either in or out of a pool.

Vertical integration solves some problems but causes others, such as a shift in control of some decision-making from the dairyman to the cow pool. This can be good, if it results in more efficient production. The family can

still prosper, and the rural scene may still furnish the family with advantages of favorable social environment. Even if the farmer gives up his managerial job, good or bad, he still has his labor to sell. The farm labor market left to him still must be competitive and furnish him full value for his labor if the pool is to be worthwhile from his standpoint (40).

## Milk Price and Grade

It has been stated repeatedly that one of the main advantages of cow pools is up-grading of milk price from Grade C to Grade A by participation in a pool (8, 9, 24, 49). It is very doubtful if a pool will be attractive to a Grade A producer, unless the producer is small, needs to make expensive changes to continue to meet Grade A requirements, is temporarily incapacitated, is short of labor or wants to partially retire. Even in most of the above cases, if the market price of cattle is high, it may be better for the producer to sell the cattle and invest in other types of enterprises. If the pool is operated efficiently and the quality of the producer's cows is above average, it will probably be best to place the cows in the pool.

## Alternative Employment

Hired labor is one of the major problems in cow pools. Many dairymen pay themselves less than a standard wage for their own labor in order to stay in business. Not so with the cow pool which must pay going wages. Can the cow pool's greater efficiency, in relation to that of the small Grade C milk shipper, offset the higher effective labor cost it incurs?

Many alternative types of employment for the dairyman and his family have been suggested (24, 9, 49). The following are some of the questions that

must be answered.

Can the labor saved on the farm be put to profitable use?

Are there alternative uses for the labor saved, loss of labor income of the wife and non-employed children whose labor cannot be used at other farm projects?

The dairyman may want to retire or have more leisure time.

How will the building and equipment be used?

What use can be made of the building and equipment?

What will it cost to remodel present buildings to accommodate other enterprises?

What are the possibilities of a contractual arrangement with the pool to perform one of several functions, such as production of roughage, production of grain, manure disposal and sale, care for dry cows, care for heifer calves, care for replacement heifers, furnish replacement cows, and employment at the pool.

Can changes be made in the cropping program to use time saved by placing cows in the pool? The seasonal balance of labor now present will be changed. The dairyman need to reorganize.

The dairyman may be able to operate the remaining farm enterprise more efficiently and may be able to get greater labor income from other projects, such as steer feeding, a hay project, or employment off the farm, either part-time or full-time.

The items suggested above will not affect every farm in the same way, however, most dairymen will need to consider several of these points before a wise decision can be made. The change in labor and/or use of this labor time saved should be considered very wisely.

## Income Changes

Cow pools, to be successful, must make a profit both for the management and for the farmer furnishing the cows. A dairyman must make a satisfactory living for himself and his family, if he desires to remain in the dairy business.

Many income changes will be brought about by placing cows in a pool. Several questions need to be answered as to possible income changes (9, 24, 49). Some of the questions that need to be considered are:

What income level changes, if any, should be expected?

Will there be an increase in net market price received?

Will this increase be a relatively permanent increase?

Will there be a change in level of production per cow?

Are the pool management and feeding practices better or poorer than at home?

Will the cow adjust to mass handling and feeding?

What management changes should be expected on the remaining enterprise on the farm?

What management changes will the pool exercise on the cow?

How about T.L.C. (tender loving care)?

What are your personal preferences about milking cows?

What about the loss or reduction of market for farm-grown roughages, especially pasture?

Can a suitable alternative livestock program be initiated to make use of the pasture?

Can land now in pasture be placed under cultivation under proper management and return more in rotation with other crops?

Will there be much reduction of returns on investment in specialized dairy equipment?

Can these be disposed of without loss?

What will be the cost of remodeling the dairy barn to use in other types of enterprise?

Will this alternate type of farming have as stable an income as dairying?

Will the alterations on the present building necessitate raising calves and caring for dry cows some place else? What will this cost?

The dairyman's income in the pool will be determined by the level of production per cow, net market price, cost of feed and services provided, and length of life of the cows in the pool. It is impossible, at present, to know how some of the above will be affected by the pool. However, it is conceivable that the level of production per cow will increase in the pool if better feeding and management are used. Cows under good feeding and management at home may produce less at the pool. Some cows may not be able to adapt themselves to the mass handling employed by pools.

Many of the above questions can be answered about cow pools by carefully reading the contracts. On other questions, for instance, level of production, life expectancy, and incidence of disease, little experience with cow pools is available. Currently, the best source of this information is from farmers who have cows in the pool being considered.

## Evaluation of the Contract

Contracts take many different forms insofar as the services offered and the cost of the services. Contracts also serve to allow top management to pass down quality and quantity requirements. Should cow pools become very

popular and tightly integrated, the less the attention to desires of the farmer would be. If a large part of the commodity is not produced under contract, those who do so produce will have a much looser contract (13). At the present time most milk is produced outside the pool, so by Castle's standards the contract is loose.

Production function analysis may be more valuable with integration, because fieldmen and managers can be specialists in their fields, whereas the farmer knows less about producing a larger variety of products.

Castle suggests that farms of the future may fall in four classes (13).

1. Farms that are integrated by ownership.
2. A farm completely integrated by contracts.
3. A farm partially integrated on a one or more enterprise.
4. No integration at all.

For the farmer who integrates by contract, it appears that the main management problem will be which contract to sign. Since there are so many unanswered questions on which further information is needed, dairymen should carefully evaluate their existing opportunities for their dairy enterprises. Careful reading of the contract will answer some questions. Some, such as length of life in the pool, production levels, disease problems, and others will be hard to answer, because of lack of experience. One might well look at large dairy operations to get the answer to some of the problems, such as length of life and disease problems. After reading the contract and talking with farmers who have personal experience, each dairyman will still have to consider the available information in the light of his own needs and adjustments he is able to make. Other questions he may want to consider are (27):

What production cost changes, if any, should be expected?

Can the pool make savings in feed and bedding, veterinary bills, production testing and breeding fees?

Will the cow produce as long in the pool as at home?

Will disease be greater in the pool?

What are the health requirements for cows entering the pool?

Will mastitis be adequately controlled in the pool to prevent its spread?

Potential income opportunity from a contract will need to be compared with income from cows on their own farms. Both prices received and costs incurred should be figured. Strain, extension economist, and others of Iowa State College, prepared an evaluation sheet to assist farmers to compare their present dairy enterprise with that of the available figures from Fashion Farm as the cow pool (See Appendix, Table 1). These sheets were set up so that standard bench marks could be used, if records on the farm were not available. An example was prepared to illustrate the use of the sheet, using the following theoretical conditions: herd size, 15 cows; production, 8,000 pounds of 3.8 percent butterfat milk. Base price for manufactured milk, which the farmer now received was $2.90 per hundredweight for 3.5 percent milk with a seven cent butterfat differential. This would be a gross price of $3.11. His equipment includes an old stanchion barn. He has no silo, uses a pail milker, a can cooler, keeps no production records, and values his labor at $1 per hour. He wishes to compare this to the conditions offered by the cow pool with a $4.41 per hundredweight average for 3.8 milk.

In the analysis of the example, neither opportunity appeared profitable (Part IIIa) but use of the cow pool facilities showed the loss, $19.61 per cow compared to $140.40 per cow on the home farm.

A steady flow of income interests many farmers more than covering both

cash and indirect costs connected with the milking of cows. This must be so or many dairymen would have already quit dairying. If only major cash costs a farmer experiences with the herd are considered (Part IIIb), one has a "cash in the bank" analysis and the farmer would favor keeping the cows at home. This is due to the fact that many of the costs such as depreciation and labor are paid to the farmer himself when the herd is at home, but in the pool they are cash costs.

It would seem from this analysis that adoption of cow pool form of milk production might depend on how farmers view their costs and whether they are now on a Grade C market. One must also recall that the average cow in Iowa produces just over 6,000 pounds of milk instead of the 8,000 figured. This could lower the income at home, but still leave the cow pool figure the same, because of better management practices at the cow pool. This cost analysis would indicate that for cow pools to survive as such, the dairymen must have the opportunity to go from Grade C to Grade A milk.

Commercially operated pools have various fixed costs set forth in their contracts. All contracts reviewed have a cost of $30 to $40 per year for building depreciation. The Modern Dairy contract calls for a cash payment of $150 each year to cover all costs except feed, veterinary, breeding, and transportation costs. This is the only contract reviewed that set many of the fixed costs such as depreciation, electricity, labor and management at a definite figure. All other contracts left this figure on a pro rata basis.

Services rendered by the commercial operators generally include provisions completely to take over all necessary operations of caring for the milk cows, dry cows, and most had arrangements made to raise the heifer calves.

The cooperative cow pools all require memberships in the pool, plus the other costs which were lower than commercial pool costs. The Utah pools were usually financed by the sale of stock on the basis of one share of stock for each cow placed in the pool.

## Contractual Obligations Involved

While there are some variations to the contractual obligations involved depending on the particular pool and services rendered, they do, in general, cover the following (8):

All cows must have a recent clean bill of health for tuberculosis, brucellosis, leptospirosis, mastitis, and in general be in a good, healthy condition. In some cases, cows must come from a herd that is free of the first three diseases, as well as passing the test before entering the pool.

The pool operator agrees to furnish satisfactory housing and equipment to care for the cows. The pool operator also agrees to furnish, and the cow owner agrees to pay for, all labor, veterinary care, feed, DHIA or other testing, breeding fees, and marketing costs. All of these, or a part of these, may be at a set cost or a pro rata cost.

Returns to the farmer are computed either by the DHIA record or by other methods, such as keeping each herd owner's milk separate at the time of milking. Copies of Fashion Farm and Neosho Valley Cooperative pools contracts are in the Appendix.

At the Fashion Farm pool, owners are paid on a monthly basis with the following costs deducted (8):

Labor - prorated on a share of the pool's monthly cost.

Breeding at $1.75 per cow.

Veterinary - prorata share of pool cost for month plus any special care necessary.

DHIA costs - 35 cents per hundredweight plus federal marketing, 10 cents central processing per cow per month.

Marketing - 48 cents per hundredweight plus federal marketing order charge of 5 cents.

Miscellaneous costs, such as sanitizers, electricity, heat and bedding.

Feed costs on a per cow pool average.

Management cost at five percent of the remainder.

After the above costs are deducted for the cow, the herd owner is billed for the balance, and the cows can be held by agreement in the contract in lieu of this balance due.

## Dairymen as Lenders of Capital

A transfer of capital is actually accomplished when cows are moved from the home farm to the cow pool (8). If the herd owner does not have sufficient capital to finance another enterprise such as cattle feeding or a beef cow herd on the home farm, or does not take on other employment, he will find his income reduced, because he has no sale for his labor. Drastic changes in the cropping system could make up this difference. Whether or not these drastic changes can be made, will be determined in part by the type of land on the home farm or land that could be rented. With highly fertile land that is relatively level, this change can be made rather easily. However, on land subject to erosion or too rough to farm, elimination of pasture and forage crops would seem questionable.

If the type of land is such that another livestock enterprise cannot be added to make use of the forage, the elimination of the dairy enterprise could further reduce income, if the cash market for the unused forage is less

favorable than marketing through livestock.

Farmers are usually considered, as a class, to be borrowers of capital and not lenders. To the farmer who is short of capital, it would seem that the cow pool holds little hope for him, unless, by entering the pool, he is able to market the time saved in labor at home in another way, such as part-time or full-time employment. It would not seem logical for a farmer to be short of capital to change from Grade C to Grade A, or to increase the size of another enterprise on the farm.

The farmer who wants to retire and the widow left with a herd of cows would still be interested in the pool, because in this case, capital to start or enlarge another farm enterprise would not be a problem. It would, thus, be a problem of, "will the cow pool return as much money on the investment as if the cows were sold and the money invested in stocks or bonds?"

Since banks and lending agencies on the whole are more reluctant to lend money to dairy enterprises, it would seem that this reluctance would be increased if someone else, other than the borrower, were going to manage the cows. Since the lending agency is interested in a profit on its money, it would be likely to make the loan either directly to the cow pool to purchase cows, or to buy and own the cows themselves.

## MANAGERIAL PROBLEMS

Feeding, record keeping, management, sanitation, and health problems loom large and may multiply fast, when the herd size increases at a rapid rate. Routine day-to-day management problems, which are easily handled in small herd operations, can be limiting factors in the performance of individual cows and herds.

Perhaps the best place to look at management for a cow pool would be to consider the large herd management practices of Arizona, California, and Florida. Many of the routine management practices used in these areas will also apply to the areas where cow pools have been organized. Perhaps the greatest difference here is the snow and freezing temperatures that add many problems in housing, cleaning, and feeding of a large herd compared to a smaller herd. The problem of a large supply of good-quality roughage is not as great in the Arizona and California areas as it may be in the Midwest, eastern, or northern part of the United States.

Skillful management has paid off on New York dairy farms (4). The top 30 farms of 559 studied had an average return of $10,095. labor income per operator. The low 30 farms averaged minus $1,564 income. Some of these differences were that the high group had 20 more cows per herd and sold 2,200 pounds more milk per cow. These farms also sold nearly 100,000 pounds more milk per man employed. The feed cost per cow was a little less on the high income farms, and the average machinery cost per cow was $40 less. The labor income per cow ranged from $65 to $157. The higher incomes were from the cows with the best production.

Pool management will have to be as efficient or more efficient if it is to survive in competition with good small operators.

Recent studies at Purdue University gave the following breakdown of dairy production costs (23): feed, 49.4 percent; labor, 23.6 percent; building, 5.1 percent; equipment, 1.7 percent; interest, 3.7 percent; taxes, 1.5 percent, and 15 percent for other things.

## Records

A complete system of record keeping should be established at the pool operation. These records must include cost records for feed, labor, etc. Records of health of the cattle, breeding, production, and calving also are necessary.

A complete system for identification of cows must be established, since many herd owners are involved, and many cows enter and leave the pool each month. It will probably be best to establish a coded eartag plus neck chain system of identifying both the cow and the herd. One or the other of these could occasionally be lost so that a cross reference would prove beneficial, if not necessary.

Performance records are needed in any dairy operation. Standard DHIA testing, making use of central processing, fits a cow pool quite well. Testing a large herd, such as a pool, is no easy task, because of the fact that large numbers of cows will leave and enter the herd. It would seem the Utah cooperative milk barns would work out a cow testing program of some type. They are the only pool operations studied that have no testing program.

## Feed Supply and Method of Feeding

Most of the large-scale dairy operations in the Southwest have gone to a system of purchasing all of the feed supply. This seems to allow the most efficient use of the labor force in the cow operation. It also greatly reduces the over-all capital investment. In Arizona only 17 percent of the dairymen have complete hay-making equipment (54).

The procedure to develop a method of purchasing quality feeds, especially

roughage, must be developed. Grain is relatively easy to control as to its quality and can be contracted for from a feed manufacturer. Roughage quality is perhaps the largest single problem, since the quantity needed is so great for a large number of dairy cows. It would be wise for the management to develop a system of buying hay on a protein test by sampling the hay and having analyses made for the protein and crude fiber. This would present many problems because of present methods of marketing hay and from the fact that many of the present producers of hay might have three or four cuttings of hay, representing a total of 15 to 20 tons.

In a small herd, this presents two problems, both of which are easily overcome. One, this is the only roughage the producer has, so he uses it. Two, the poor-quality roughage is fed along with the good, thereby averaging out the quality. In the pool, this latter is not practiced.

In protein tests on hay used at Modern Dairy, it was found that the two lots of hay varied from six to 18 percent in protein content (22), yet both batches were purchased for the same price. Mr. Freel is considering adapting the practice of testing before buying and also of offering a premium for high-quality tested hay. His idea is to buy the hay directly from the field, with the price to be determined by the protein analysis.

In most areas, it would seem more practical to make a lot of use of dry hay and/or pellets. This, of course, would depend on cost of the hay, distance of haul, and cost of the green chop, and distance of haul. If the haul becomes very long, the cost of green chop will be excessive, because of the moisture content of the green chop. In general, green chop and silage are not economical to feed if the haul is very far (54).

Perimeter feeding is essential if one is to get the greatest efficiency

from the utilization of labor and equipment for a large variety of feeds (54). Dairymen are mechanizing rapidly at the present time. Automatic feed wagons to feed silage, green chop, chopped hay, and pellets are common. The power load furnished by man has shifted greatly. In 1850, man furnished 15 percent of the power load, compared to four percent in 1948 (18). Perimeter feeding and mechanical handling of all feeds is a must for efficient operation.

The problem of quality roughage could intensify, if the dairymen who furnish the cows decide it is more economical to grow grain than to continue their present land use in roughage. This shift could be changed somewhat by the nature of the Federal Farm Program. Grains are a surplus item, and at present, any price change seems to be towards a lower grain price, which should not encourage more grain growing.

Pelleted dairy rations could greatly change the feeding procedure on dairy farms. This is a new field and little experimental work has been done. Should this prove feasible, self-feeding of a large part of the roughage would be possible.

## Water Supply

The water supply would need to be considered in the location of the pool. It would also need to be considered in the management, especially as it concerns its availability to the cows. The cows should have free access to water of a moderate temperature at all times. During the winter, the tanks should be protected to keep them from freezing and, better still, maintained at a temperature of 50° F. or higher. The tanks should be equipped with floats or overflow pipes, so that excess water does not cause mud holes, or, in the case of concreted lots, formation of ice for the cows to walk on.

## Health Problems

With increased herd size and the resulting concentration of cows, the health problem becomes a very important consideration. This problem is further enlarged by the fact that cattle in a pool come from many herds and that visitors may bring in disease if allowed free access to the lot facilities.

Adequate local veterinary service is important. Veterinary service should probably be arranged on a retainer or other prearranged method of charges. Appropriate provisions are required for isolation, treatment, breeding, maternity, and other special needs for private stall facilities. Daily veterinary inspection is a necessity. New cows entering the pool should be isolated for at least one week and given a thorough health examination.

The mastitis problem can be large. Fashion Farm had about 25 percent of its cows infected (15). This may not be any worse than some herds, but it is entirely too high in incidence for a well-managed health program in a cow pool. The author saw several three-quartered cows at this farm, and he was told by one of the employees that the only mastitis precaution being followed at that time was to milk a little milk on the floor, and, if no big chunks showed up, the cow was milked.

At Modern Dairy the cows must pass the California mastitis test before being admitted to the pool. When this pool was first started, one herd brought in showed 20 reactors in 21 cows. At the end of one week, all but one of these cows had cleared up to the California test. The only treatment given the cows was proper handling and milking methods. The one cow was sold (22).

The health program must also be tied in with the sanitation program,

as the health problem can be increased, if the sanitation program is not adequate.

## Sanitation and Manure Disposal

Sanitation cannot be good, unless manure disposal is adequate. Manure disposal in a large dairy operation can be a big problem, as the large dairies of California and Arizona have found. This problem of manure removal could be greater in an area of large rainfall, because of the fewer days manure can be removed from dirt lots.

If lots are paved and the pool is located in a sandy area, as is Modern Dairy, manure can be removed and hauled to the field. Fashion Farm has hauled many loads of corn cobs into its lots. This will help until the cobs begin to rot, at which time lot conditions will become worse than had no cobs been used.

In California, dairymen have gotten together to form a cooperative to get rid of manure (16). The cooperative contracts to take all manure from the dairymen at $2 per ton. The manure is stock-piled and sold to citrus growers and other farmers, greenhouse operators, and others needing fertilizer. In this organization, 300 dairymen own 80,000 cows. A cooperative venture with this volume would be expected to succeed. One with only 1,000 cows, as a pool in the Midwestern area, would doubtlessly be inefficient; however, some of the methods should be investigated if manure cannot be disposed of in other manners.

Disease could spread quickly in heavily populated lots improperly cleaned, and management must be ever alert for preventing the spread of disease. Leptospirosis, foot rot, mastitis, and pink eye could quickly hamper herd operation.

Fly control can present a real problem. While it is true we now have many insecticides to kill flies, some of these should not be used on dairy cattle, and all should be accompanied by the use of a good sanitation program. Waste disposal, if not properly planned, may become a serious problem. Proper cleaning facilities for holding areas and milking stalls are important.

A farmer with a small number of cows may be able to wait until he has finished milking to clean his milking stalls and holding area. The pool may need to clean several times during the milking operation to insure proper sanitation in milk production. The pool may also need to clean the milk lines and machines during the milking operation.

The use of antibiotics in mastitis control with no method of identifying animals for 72 hours after treatment could result in milk from treated cows being sold with the rest of the milk (37). Since the Federal Food and Drug Administration has announced a program of testing and allows no tolerance for antibiotics, this could lead to loss of an entire shipment of milk.

## Labor

Recruiting, training, and supervising the working force requires skilled leadership and management ability. The work responsibilities of each employee need to be set up in keeping with conditions on farms and industries in the locality. Toilet and shower facilities and private lockers need to be made available for the workers.

Since proper milking is a highly skilled operation, it will be necessary to make sure the milkers have the proper training and are using the routine recommended for proper milking, mastitis prevention, and other sanitary practices for the production of a good product. The personal interest of the

milker in each cow is essential to proper milking management. It may be necessary to offer a bonus for proper milking, mastitis prevention, and quality milk production.

The use of labor-saving machinery has grown considerably in the past few years, especially since the last world war. Not only is good equipment available now, but it costs relatively less than in the past. Cost relationships favor replacing labor with mechanical equipment now more than before. Prices of farm wages have gone up four times as high in the past 20 years, while machinery and equipment have doubled (55).

To make full use of present labor-saving equipment, the design of the plant must be studied. On many dairy farms, the existing buildings are the major stumbling block to effective use of mechanization, especially in feeding. Since most cow pool operations involve the building of a new plant outlay, professional planning is often needed to establish effectively a system for processing and distributing feed. How well this system is planned will determine, to a large extent, the total labor required, as well as the machinery required.

## Dry Cow and Breeding Problems

A system using a combination of pregnancy examinations, breeding records, and color tags on the neck chain, should be set up so that the farmer owner can be notified when to get the cow, if the cows are to be returned to the owner during the dry period. If the pool has facilities and contracts to care for the cows during the dry period, this same system could be used to know when to place the cow in the dry lot.

All pools now in operation use artificial insemination in one form or

another. Two methods have been used. In the first, semen is purchased from the local artificial breeding association, but the cows are inseminated by an employee of the pool. In the second, the pool arranges with the local artificial breeding association for the purchase of semen and insemination of cows. In some of the large California dairies, an artificial breeding service is carried on in connection with the dairy operation, in which case the dairy has semen for sale. The number of cows in the pool and the available technical help will determine to a large extent the system used.

If the pool has facilities for caring for the dry cows, a program will need to be worked out whereby the cow is cared for during parturition and milking until the cow can be returned to the regular milking herd. With this system, a strict sanitation program would need to be followed at the pool. If the cow is taken home and brought back to the pool, she should need to pass the same health requirements of any new cow coming to the pool.

## Calf Program

If cows calve at the pool, a very strict sanitation program will need to be followed, if the calves are to be raised. Some of the large herds have experienced severe losses of calves, where sanitation was not strictly adhered to (54).

At present, none of the pools have facilities to raise calves at the location of the pool. This means that the calves are raised on a special farm through contractual arrangement, calves are sold at community sales, or are returned to the owners to raise. Most pools have the calves removed from the pool farm in three to five days. Freel experienced difficulty taking bull calves to community auction sales, because their navels were painted with

iodine (22). It became necessary for them to have the sale veterinarian explain that the calves had been so treated to prevent infection.

If pool cow owners are investors, it will be necessary for pool owners to either have facilities to raise heifer calves and yearlings or have contractual arrangements for this service to be available to the investor. It would seem that the pool should have arrangements for calf raising, since the pool needs high-quality cows, properly grown, and with proper producing ability, if they are to be most efficient. There is a definite trend for California large-scale dairies to raise their own replacements (31).

## Public Relations

Public relations constitute a problem with cow pool management, especially while the idea is new and receiving so much publicity. Observation areas need to be provided, which do not interfere with milking or other regular chores such as feeding and cleaning. Parking, toilet facilities, safety precautions, and restrictions on smoking and entering lots should be clearly posted. The general appearance of the place is very important. One should always keep the best foot forward.

# SAMPLE BUDGETS

Data obtained in a recent survey in Utah showed that Grade A milking barns required per cow investments for a Grade A milking barn and equipment amounting to about $250 for herds under 20 cows (44), $200 for 25 cow herds, $170 for 35 cow herds, $150 for 45 cow herds, and $125 for 55 cow herds. The largest unit of the cooperative barns has a per-cow investment of $100. The smaller units vary from $180 to $200 per cow. On this basis, the 25 cow herd

or larger is not making any particular saving on investment by joining a unit smaller than 200 cows or shares. The owners of small herds can make a substantial saving by joining in a cooperative milking barn.

Milk production costs will vary from one area to another. These costs must include both the cost of the cow pool owner and the cow owner. A committee at Kansas State University formulated budgets for a specific organization (24). The basis of cost estimates was made on prices during the past several years. Charges for labor were based on time studies of large dairies in other states than Kansas; however, Kansas wage rates were used. This is just an estimate or a reasonable guide to approximate costs of milk production in Kansas. Anyone interested in a contractual dairy venture in a cow pool should prepare similar budgets to fit his specific needs.

The following specifications and assumptions for this budget are:

| | |
|---|---|
| Number of cows | 1,000 |
| Production per cow | 10,000 lb. milk, 360 lb. fat annually |
| Price per cow | $350 |
| Acres of land | 50 at $300 per acre, tax rate 33 1/3 percent |
| Tax rate | $45 per $1,000 |
| DHIA cost | 20 cents per cow per month |
| Insurance costs | $1.80 per $100 insured value |

Cows would be milked in five milking units each with four cow elevated stalls, pipeline milker with bulk storage tank, loose pole-type housing, concrete paved lots, and cows milked ten months at the pool, with the farmer keeping the cow two months (Table 1 and Table 2).

Cost per cow in the various pools vary considerably. Where all costs

Table 1. Estimated cost per cow of producing milk: 1,000-cow pool, producing a minimum of 10,000 pounds of 3.6 percent milk (24).

| Item | Total | Pool | Farmer |
|---|---|---|---|
| Feed | | | |
| Concentrates | | | |
| 30 cwt at $2.20 | $ 66.00 | $ 66.00 | -- |
| Roughage | | | |
| 2.5 T alfalfa at $17.50 | 43.75 | 36.47 | 7.29 |
| 6.5 T silage at $6 | 39.00 | 32.50 | 6.50 |
| Bedding | | | |
| 1.25 T straw at $14 | 17.50 | 17.50 | -- |
| Labor | | | |
| One manager | 7.50 | 7.50 | -- |
| Milking, feeding, etc. | 78.75 | 78.75 | -- |
| Dry period | 10.00 | -- | 10.00 |
| Replacement | 33.50 | -- | 33.50 |
| Operating Costs: | | | |
| Interest on cow | 17.50 | -- | 17.50 |
| Land | .90 | .90 | -- |
| Buildings | 17.54 | 15.74 | 2.00 |
| Equipment | 18.84 | 18.84 | -- |
| Feed inventory | 1.52 | 1.52 | -- |
| Miscellaneous | | | |
| Taxes on cow | 2.45 | -- | 2.45 |
| Artificial insemination | 7.50 | -- | 7.50 |
| Supplies and repairs | 6.00 | 6.00 | -- |
| Veterinary fees | 5.00 | 5.00 | -- |
| DHIA | 5.05 | 5.05 | -- |
| Ind. Ins. | 1.50 | 1.50 | -- |
| Social Security | 1.25 | 1.25 | -- |
| Telephone | .25 | .25 | -- |
| Total | $381.30 | $294.56 | $86.74 |
| Credit for calves | 18.00 | -- | 18.00 |
| Net cost (excluding hauling) | 363.30 | 294.56 | 68.74 |
| Milk hauling | -- | -- | -- |
| Cow transportation | -- | -- | -- |

Table 2. Investment table (24).

| | | | |
|---|---|---|---|
| Land 50 A at $300.00 | = $ 15,000.00 | | |
| Buildings | = 200,000.00 | | |
| Equipment | = 75,000.00 | | |
| Operating Costs, Land, Buildings, Equipment, and Feed Inventory | | | |
| Land | | | |
| Interest $15,000.00 at 4 1/2% | = 675.00 | | |
| Taxes | 225.00 | | |
| TOTAL | | | $ 900.00 |
| Buildings | | | |
| Depreciation at 5% | = $ 10,000.00 | | |
| Interest 1/2 of $200,000.00 at 4 1/2% | = 4,500.00 | | |
| Taxes | = 2,250.00 | | |
| Insurance 50,000 at 1.80 per $100 | = 900.00 | | |
| Repairs | = 1,000.00 | | |
| TOTAL | | | $18,650.00 |
| Equipment | | | |
| Depreciation at 10% | = $ 7,500.00 | | |
| Interest 1/2 of $75,000.00 at 5 1/2% | = 4,125.00 | | |
| Taxes | = 1,687.50 | | |
| Insurance | = 300.00 | | |
| Repairs and supplies | = 900.00 | | |
| TOTAL | | | $22,612.50 |
| Feed Inventory (1/3 of roughage supply) | | | |
| 700 T alfalfa hay at $17.50 | = $ 13,125.00 | | |
| 3900 T silage at $6.00 | = 23,400.00 | | |
| | $36,505.00 | at 5% | $ 1,826.25 |

but the cows are included, they vary from $150 per cow for Modern Dairy (22), $300 per cow for Fashion Farm (41), $325 per cow for Neosho Valley Cooperative (21), and $100 to $200 per cow for the Utah Cooperative Milk Barn (44). There is considerable difference in the way these units are equipped. Modern Dairy is the only one operating completely on concrete, so far as both lots and alleys are concerned. Construction costs of the barns vary; Modern Dairy's pole-type barn cost 75 cents per square foot. The Neosho Valley barns cost $1.25 per square foot. The author has seen both buildings and would choose the Modern Dairy barn over the Neosho barn, even without considering cost.

## COW POOLS -- PROS AND CONS

Perhaps some situations will lend themselves to large-scale independent operations by fewer farmers and prove to be stable and permanent types of organizations.

Some of the advantages of integration are: control of supply, financing, maintaining quality, production, know-how, and marketing directly to the retailer. The farmers, such as dairymen, beef producers, and growers of grain and forage crops, are less interested in integration and more interested in larger private operations. It is entirely possible that the next several years will see a trend toward larger private operations than toward vertical integration, especially in some fields (42).

Many questions concerning the effect of cow pools still exist, and many will not be settled for a long time. Production has exceeded demand, except in war times. Increased mechanization, accumulated capital, and increased labor efficiency on the farm have put farmers in a position to increase

production tremendously. Over-production or under-consumption can only result in lower prices. If pools become too numerous, the Grade A market could increase its surplus to the point that there would be but one grade of milk. Any manufacturer of milk would rather have Grade A milk to process than Grade milk. This might not be bad for the industry as a whole, but it could lower the blend price to the producer considerably.

Since one of the big reasons now favoring cow pools is a price change in the marketing of milk, pools could work to their own self-destruction, unless through management, their efficiency is improved enough to meet competition. Dairymen, like most other types of farmers, are under pressure to reduce unit cost (34). In the next decade, the increase in scale of dairy operations probably will rise even more rapidly than in the last ten years.

A widespread and wholesale integration of milk production units with processing and distribution systems could do more than lower the general price for dairy products. It could close the Grade A market now available to smaller, less efficient dairyment.

In 1941 there were 760,000 dairy cows on farms in Kansas. In 1958 there were 394,000 cows. This would mean that 394 1,000-cow pools could replace the present dairy business in Kansas. McCammon suggests that pools may increase milk production per cow from forty to fifty percent, based on the average Kansas production (38). This would mean that only about 197 1,000-cow pools would be necessary to replace the present production. Potentially, this might be possible; however, it does not seem very probable, at least in the forseeable future.

One might expect cow pools to be a little different in the future (39). The pool will own the cows as well as the facilities as a partnership or

small cooperative. If this happens, it will become a large dairy operation -- not a pool. The pool will become highly efficient, but the size may be smaller, perhaps 200 to 500 in cow numbers. Pools will have the best chance to succeed in areas where quality roughage is plentiful and producers are now selling on a Grade C market. Pools will continue to be a threat to the market.

Traditionally, the small herd of dairy cattle has been a means of utilizing surplus roughage and excess labor. Many farm families, limited in capital and short of land, have managed to "pull themselves up by the boot straps" with a few cows. To many of these farmers, the small dairy herd is an income stabilizer. To the extent that the small dairyman is a low-cost operator with fully depreciated barn and second-hand equipment and no debt, he may not feel the cost-price relationship as much as the larger herd or pool herd. During the periods when some farmers attempt to find better alternatives in town, the small dairyman usually does not find as many alternatives available to him as does the larger farm operator, who is a real businessman. These are some of the reasons that this type of producer will not be interested in a pool, since he will have no other use for his labor. The Topeka Grade A milk market has 77 producers in September who produced less than 200 pounds of milk daily (47). So long as these producers are not forced out of the market, they will offer real competition.

Figures from Purdue University show that the number of cows necessary to give a $3,700 labor return on different levels of production are (23):

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 6,200 | pounds | of | milk | per | cow | - | 131 cows |
| 7,500 | " | " | " | " | " | - | 57 cows |
| 10,000 | " | " | " | " | " | - | 29 cows |
| 12,500 | " | " | " | " | " | - | 18 cows |

It is hard to conceive that a cow pool could become efficient enough in

its operation to meet the competition offered by the dairyman with 18 to 29 cows who could certainly give his cows "tender loving care" and still be largely a one-man operation. Perhaps the best defense of the smaller dairyman against cow pools is also his offense; to increase milk production per cow before increasing cow numbers. This dairyman could compete with the cow pool so long as the markets remain open to both of these producers.

To what extent are the cows milked in a pool "additional" cows that would not have been milked anyway? This question can only be answered after pools have more years of experience. If the pool, through better management, is able to take the average cow, which in Iowa produced 6,480 pounds of milk, and raise this production to 9,000 pounds of milk, the reported figure for Fashion Farm, this would be extra milk production. Cows at this production level will probably stay profitable in a pool longer than on the home farm. This is true where the home farm must be run on more than a subsistence basis. If the home farm is to be run on a subsistence basis, placing cows from this type of farm in a pool will add to the surplus of Grade A milk and will, therefore, lower the blend price.

What is to be done with the roughage on these smaller farms, or even if two or three small farms merge into one unit? This merger does not change the fact that there are certain areas of the farm that are adapted only to pasture. This farmer, along with numerous other farmers, cannot go into the beef business. This would ruin the price of beef cattle, neither can everybody raise dairy heifers.

Pools are strictly a dry-lot type of operation. This means they must be located in areas where the land will produce more in row crop or quality hay than in pasture. Smaller pools might be able to use some pasture along with

green chop. This, of course, would be impractical for large pools. Some of the Utah pools have found the time involved in driving the cows to and from the pool is longer than the time required to milk the cows. In these pools a 12-year-old boy could do the job, where in the large pool a man would need to be hired.

Unions have followed large-scale dairy farm operations and are very strong in California. How can the pool operator hope to do anything but meet the union's demands for wages? The cows cannot be closed down for a month or two while the union is on strike and then brought back into production. Union organizers are not so interested in firms that hire only two, three, or four helpers. The pool would certainly be in a position where it might need to consider labor contracts.

Perhaps one of the best criteria to judge how long pools will last is profit (52). Contract farming will continue so long as both parties have a chance to make a profit. Many articles have been published on cow pools, but in the main, they center attention chiefly on one individual case and this one has been in operation but one year, which is not long enough for a real test. It is the author's opinion that this pool will not survive, unless management practices are improved. The problems are not beyond rectification.

There will be many pools started; however, the dairyman who is well equipped to operate a well-balanced, dairy farm business, which fits his ambition, labor force, capital and management ability, can weather it out for quite a few years, just by doing a good job at home.

## SUMMARY

This report is a summary of the available information concerning cow

pools, their operation, and possible effects on the dairy industry.

The material has been divided into various phases of the cow pool, giving information on the present dairy situation, possible causes of cow pool formation or interest in pools, organizational problems, management problems, and possible effects on the industry.

It would seem that pools are most likely to succeed in areas where cream or manufactured milk is now sold and where good quality roughage is available. At this time, it seems that price differential between Grade A and Grade C milk has caused the most interest in pools.

Management details in a pool will need to be well worked out. Details that are taken in stride in a small operation may be a major problem in a pool. A supply of good-quality roughage, manure removal, labor, and sanitation which includes both herd health and quality milk are perhaps the biggest management problems. This does not mean that there are not other problems that must be settled, such as water supply, etc. There is no reason to suppose that the above problems cannot be overcome in a satisfactory manner because there are large dairies in operation which have overcome these problems.

It is logical to expect that cow pools are more likely to have better management than if handled by many less efficient owners. The pool must have more efficiency from each man it employs and will have a high degree of mechanization used in the operation. The physical costs of a pool operation figured on a per-cow basis should be much less than on individual farms. However, fixed cost may be higher because the farmer is using less expensive labor than the pool, as well as old, and in some cases, worn out buildings.

Considerable attention must be given to the cow pool layout if maximum efficiencies are to be realized in feed mechanization and cow movement within

the pool. The cow pool should have an overall plan well engineered before the building of the plant is started.

The farmer who contemplates placing cows in the pool should carefully consider alternative uses for his labor as well as other labor used in his present dairy operation. The question of alternate employment is important. The cost of increasing the size of other enterprises to use the saved labor or the roughage that might otherwise be relatively unsalable should be considered. The farmer who wants to figure his returns on a "cash in the bank" balance, will probably still have a larger bank balance by milking his cows at home.

Financing of the pools is accomplished in many ways. Perhaps the best way to secure adequate finance, and at the same time assure cows enough to fill the pool, is to use a contract calling for a deposit on each cow to be placed in the pool. This deposit to be held in escrow until operation starts.

If the deposit is $30 per cow and a pool of 1,000 cows is planned, a sizable amount of the finances has been raised with the assurance of cows to fill the pool.

The operating budget must be considered as well as the inventory budget. It seems logical to expect formation of a few more pools, however, it now appears that cow pools will not be a serious threat to the entire dairy industry. They may increase the speed of elimination of the small inefficient dairyman who is not satisfied with a subsistence type of dairying. In the near future one may expect the present trend to a larger and/or more efficient dairy unit by increasing herd size or more efficient management.

One can expect cow pool numbers to increase so long as a profit can be shown for the management as well as the farmer placing the cows in the pool.

There is no reason to believe that the dairyman who is doing an efficient job with an enterprise of sufficient size to meet his needs, will not be here for a long time to come.

ACKNOWLEDGMENT

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# APPENDIX

# AGREEMENT FORMS

# FASHION FARM AGREEMENT

THIS AGREEMENT between Carroll Morris of Meservey, Iowa, d/b/a Fashion Farm, hereinafter called the Pool, and _____, of _____, Iowa, hereinafter called the owner, WITNESSETH:

1. The owner hereby enters_____dairy cows in the Pool for a period of one (1) year, for the annual consideration of Thirty Dollars ($30.00) per head per year.

2. All cows will be numbered upon arrival by neck chain for identification, and strict records will be kept on each individual cow by neck chain number and ear tag number, and all milk will be weighed and tested under State or Dairy Herd Improvement Association supervision, and all cows will be fed according to production. Each owner will receive records to show what each cow is producing and consuming.

3. Cows will be bred artificially, as directed by the owner. Breeding dates will be kept by the Pool and will be furnished to the owner upon request.

4. Cows will be under the supervision of a herdsman and will be provided with regular veterinary treatment. In no event will the Pool be liable for the loss of any cow, or cows. All veterinary bills incurred by the Pool will be charged against all cows in the Pool, on a pro-rata basis.

5. The Pool shall have the sole and only right to buy all feed and bedding for all cows in the Pool.

6. An accounting shall be made at the end of each calendar month on a cow month basis. All expenses, except feed, but including bedding, labor, electricity, veterinary fees, heat, accounting, and any and all other overhead expenses (not including management fees), will be apportioned between all cows in the Pool. The expense of feed shall be charged on a per cow basis and the proportionate share of the expenses, plus the cost of feed per cow, plus cost of breeding the owner's cows, will be deducted from the gross amount found to be due the owner at the end of each month. Checks to cover the net amount due the owner will be mailed to the owner at the end of each month.

All books and records will be open and available for inspection by any owner of cows in the Pool or his duly authorized agent.

7. The Pool will market all milk produced at its place of operation and business, as in its judgment shall seem best. The Pool cannot guarantee any price for the owner's milk, but it will at all times endeavor to obtain the best market available in this area.

8. The owner will be given an opportunity to renew his contract with the Pool on an annual basis, and others will be placed upon a waiting list, in order of application. The owner who lives up to this contract shall have priority over any and all who may be on a waiting list.

9. The manager of the Pool shall receive five per cent (5%) of the net income of all cows in the Pool, each month, for his services in the management of the Pool, which shall be charged to and deducted from the account of each owner, prorata per cow, on a per cow month basis, which shall be in addition to all other labor expenses of the Pool.

10. Fashion Farm will be kept and managed in a manner such that the owner or visitors will be welcome at all times.

Words and phrases herein shall be construed as in the singular or plural number, and as feminine or masculine gender according to the context.

Dated this_____day of _____, A. D., 19____

FASHION FARM

By_____

_____

OWNER

MEMBERS SERVICE AND MARKETING AGREEMENT

THIS AGREEMENT, Made and entered into this _____day of _____, 19____, by and between the Neosho Valley Cow Pool Association of Erie, Kansas, hereinafter referred to as "Association"; and _____of _____, hereinafter referred to as "Producer":

WITNESSETH:

That, for and in consideration of the mutual convenants and agreements herein contained and the execution of generally similar agreements with the Association by other agricultural producers engaged in producing milk for market, the parties hereto hereby agree as follows, to-wit:

A. PRODUCER AGREES:

1. To place in Association's cow milking pool at _____, _____, a minimum of_____cows and promptly furnish replacements therefor as and when any of such minimum number may be removed from such pool as herein provided. Producer may remove any such cow at any time when he delivers to the association an acceptable replacement therefor. The Association may at any time or times remove any cow belonging to Producer (1) whenever it falls below the Association's current production requirements as conclusively determined by the Association from time to time; (2) whenever it is found to be diseased in such a form or to such an extent as to jeopardize the health or well-being of any other cows in the Association's care or possession, as determined by a duly licensed and practicing veterinarian or by the Association; (3) whenever it is found to be so injured or crippled as to be burdensome, as reasonably determined by the Association; or (4) whenever it fails to meet any other reasonable standard or standards established from time to time by the Association.

2. That no cow shall be received by the pool until approved by the pool veterinarian.

3. To keep such minimum number of cows in such pool for a minimum period of one (1) year commencing not later than the _____day of _____, 19____.

4. To, and does hereby, make application for membership in Association and agrees to pay the Association's membership fee of $25.00 upon acceptance by Association of such application, which membership shall be nontransferable.

5. To pay annually to the Association, in advance, the sum of $30.00 per cow for each cow placed in the association pool for the purpose of defraying and prepaying taxes, insurance, and upkeep and repair on the buildings.

6. That Association shall have full and complete control and possession, during the entire term hereof, of all cows placed in the pool by Producer, and that Producer has good right and title thereto and right to possession thereof free and clear of all liens and encumbrances, except_____

_____

7. That Association shall have the right to market in its own name and for its own account all milk produced by such cows, or their replacements, while in Association's possession or control hereunder; and title thereto shall pass to Association at the time of passage thereof into measured containers provided by Association, subject only to the duty to account to Producer for the proceeds thereof as hereinafter provided.

8. To be bound by the provisions of the articles of incorporation and bylaws of Association as the same may be duly amended from time to time.

9. To pay to Association, in cash, upon demand, the full amount of all costs or charges borne or incurred by Association for the breeding or

medical care, treatment or diagnosis, special handling or removal of Producer's cows in the pool; and to, and does hereby, authorize Association to deduct any and all such costs or charges from any moneys payable to Producer hereunder.

10. To, and does hereby, authorize Association to deduct from any or all amounts payable to him hereunder Producer's proportionate share, on a per-cow-per-day basis, of all other costs and expenses incurred by Association in the conduct of such pool, including general overhead, as and when determined by Association.

B. ASSOCIATION AGREES:

1. To receive, care for, feed and milk all cows placed in the pool by Producer and accepted by Association, including replacements, until removed as herein provided; to maintain suitable records to their productivity; and to care for, store, handle, transport and market all marketable milk produced by such cows. Association shall endeavor at all times to employ the best dairy practices, high-grade equipment and supplies of all kinds, and competent, well-trained and experienced personnel, and to obtain maximum returns from all milk marketed, but shall not be liable for damages resulting from any failure so to do or for any loss or damage to any of such cows or any milk or dairy products therefrom

2. That upon arrival cows shall be numbered by Association by neck chain and ear tag for proper identification; that detailed records shall be kept on each cow according to applicable local and state laws and regulations or in accordance with Dairy Herd Improvement Association requirements; that all milk shall be weighed and tested under DHIA supervision or as otherwise prescribed from time to time by Association's board of directors.

3. To market all milk produced in such pool, in such form and manner as Association deems best for the advantage of Producer, and all others having cows in the pool; to render a monthly accounting therefor; and to pay to Producer in cash, within seventeen (17) days after the close of each month, his proportionate part, on the basis of quantity and quality of the milk produced by his cows during such month, of the proceeds from such marketing, less all payments, if any, then due and payable from Producer to Association. The payment of Producer's share of any noncash proceeds shall be made as soon as practicable but not later than the next monthly payment date following Association's receipt of the same in cash. An annual accounting as of the close of each fiscal year of Association shall also be made, and there shall be included therein proper corrections for any errors made in any such prior monthly accountings during such year.

4. That Association is a cooperative association organized and operated not to make a profit for itself or for its members as such, but to provide services to or for its members at cost; and that it is hereby and by the terms of its articles of incorporation and by-laws obligated to credit to the patrons having cows in such pool, the entire proceeds resulting from the operation thereof, on the basis of the quantity and quality of milk marketed hereunder, less the costs and expenses incurred in connection therewith, including general overhead expenses, all as determined by general accounting principles and practices acceptable for the computation of income taxes under the Internal Revenue Code of the United States, as the same may be amended from time to time.

C. BOTH PARTIES AGREE:

1. That this agreement shall not be assignable by either party without

the prior written consent of the other party but shall be binding on the parties hereto, their heirs, successors, personal representatives and assigns.

2. That a member may withdraw from the association by giving written notice to the Board of Directors thirty days prior to the anniversary date of his contract with the association.

3. That, being a cooperative association operated not for its own benefit but for the ultimate benefit of its patrons as agricultural producers, Association may from time to time adopt reasonable rules and regulations for the conduct of its operations hereunder which shall apply uniformly to all members having cows in the pool; and such rules and regulations shall be as binding as though set forth verbatim herein.

4. That this agreement shall be and remain in force and effect for a period of one (1) year, commencing on the _____day of _____, 19____, and terminating on the _____day of _____, 19_____.

_____
Producer

_____

By_____
President
Association

TABLE 1

Cooperative Extension Service IOWA STATE COLLEGE Ames, Iowa
March, 1959 Economics M-913 (Rev.)

# DAIRY ENTERPRISE ALTERNATIVE EVALUATION SHEET*

(Standard bench marks may be used when personal farm record data are not available.)

| Line no. | Item | Present system | | Alternative system | |
|---|---|---|---|---|---|
| | **Part I. Annual returns per cow above feed costs** | | | | |
| 1. | Plant price/cwt. of milk | | $ 3.11 | | $ 4.41 |
| 2. | Less hauling rate/cwt. | $ .25 | | $ .48 | |
| 3. | Less marketing service fees | $ -- | | $ .05 | .53 |
| 4. | Farm price/cwt. [1-(2+3)] | | $ 2.86 | | $ 3.88 |
| 5. | Level of production | | 8,000 | | 8,000 |
| 6. | Gross return per cow (4 x 5) | | $ 228.80 | | $ 310.40 |
| | **Part II. Annual expenses per cow** | | | | |
| 7. | Feed costs per cow | | $ 132.00 | | $ 152.00 |
| 8. | Cow dep'n., int., taxes and ins. | | $ 42.00 | | $ 52.00 |
| | Labor cost | | | | |
| 9. | Milking labor cost per month | $ 11.50 | | $ 5.70 | |
| 10. | Months milked | .10 | | .10 | |
| 11. | Total for year (9 x 10) | | $ 115.00 | | $ 57.00 |
| 12. | Dry cow labor cost per month | $ 7.60 | | $ 3.00 | |
| 13. | Months dry | 2 | | 2 | |
| 14. | Total for year (12 x 13) | | $ 15.20 | | $ 6.00 |
| | Building costs | | | | |
| 15. | Silage storage and feeding | $ | | $ | |
| 16. | Barns and lots | $ 17.45 | | $ | |
| 17. | Total building costs | | $ 17.45 | | $ |

* Prepared by J. Robert Strain, extension economist, dairy marketing, Robert C. Fincham, extension dairyman, production, Earl O. Wright, extension dairyman, manufacturing, and Fred W. Roth, extension agricultural engineer.

| Line no. | Item | Present system | | Alternative system | |
|---|---|---|---|---|---|
| | Equipment costs | | | | |
| 18. | Milking equipment | $ 5.65 | | $ | |
| 19. | Cooling equipment | $ 6.10 | | $ | |
| 20. | Total equipment costs | | $ 11.75 | | $ 30.00 |
| | Miscellaneous costs | | | | |
| 21. | DHIA testing fees | $ | | $ 5.40 | |
| 22. | Veterinary | $ 5.00 | | $ 5.00 | |
| 23. | Bedding | $ 8.00 | | $ 12.00 | |
| 24. | Breeding fees | $ 6.00 | | $ 1.75 | |
| 25. | Other | $ | | $ 5.00 | |
| 26. | Total miscellaneous costs | | $ 19.00 | | $ 29.15 |
| 27. | Total annual expenses per cow (7+8+11+14+17+20+26) | | $ 352.40 | | $ 326.15 |
| | Part IIIa. Income analysis | | | | |
| 28. | Gross income above all costs (6 - 27) | $ 123.60 | | $ -15.75 | |
| 29. | Other income credits | $ | | $ | |
| 30. | Total gross mgt. income (28+29) | $ -123.60 | | $ -15.75 | |
| 31. | Less management expenses | $ | | $ -3.86 | |
| 32. | Net mgt. income (30 - 31) | $ -123.60 | | $ -19.61 | |
| 33. | No. of cows | 15 | | 15 | |
| 34. | Enterprise income (32 x 33) | | $ -1,854.00 | | $ -294.15 |
| | Part IIIb. Alternative evaluation (Cash situation) | | | | |
| 35. | Cow dep'n allowance (8) | $ 42.00 | | $ 52.00 | |
| 36. | Non-cash labor allowance (11+14) | $ 130.20 | | $ | |
| 37. | Bldg. and equip. allowance (17+20) | $ 29.20 | | $ | |
| 38. | Other non-cash allowances | $ | | $ | |
| 39. | Total non-cash exp. (35+36+37+38) | $ 201.40 | | $ 52.00 | |
| 40. | Net mgt. income (32) | $ -123.60 | | $ -19.61 | |
| 41. | Return above cash exp. (39+40) | $ 77.80 | | $ 32.39 | |
| 42. | Total cash in the bank (33x41) | $ 1,167.00 | | $ 485.85 | |

# DAIRY ENTERPRISE EVALUATION BENCH MARKS FOR IOWA FARMERS

(These standard bench marks may be used as guides if personal farm record data are not available)

| Line no. | Item | Farm product sold: Cream | Ungraded milk | Grade A milk |
|---|---|---|---|---|
| 1. | Typical Iowa plant price per cwt. of milk | $2.05 | $3.00 | $3.50 |
| 2. | Common hauling cost per cwt. | .105 | .25 | .25 |
| 3. | Common marketing service fee | xxxx | xxxx | .04 |
| 4. | Typical farm price per cwt. | $1.945 | $2.75 | $3.21 |

| | | Level of milk production: State av. | DHIA av. | Superior av. |
|---|---|---|---|---|
| 5. | Annual production per cow | | | |
| | a. Milk, lbs. | 6,480 | 10,246 | 12,857 |
| | b. Butterfat, lbs. | 238 | 395 | 450 |
| 7. | Feed costs per cow per year[1] | | | |
| | a. All dry-lot feeding method | $ 142 | $ 162 | $ 175 |
| | b. Pasture, hay and grain feeding | 122 | 141 | 154 |
| 8. | Annual cow dep'n., int., taxes and ins. costs[2] | $ 27.50 | $ 56.50 | $ 71.00 |

| | | Size of herd: 15 cows | 30 cows | 60 cows | 120 cows |
|---|---|---|---|---|---|
| Labor costs per cow per month at $1.50/hr.[3] | | | | | |
| 9. | Milking labor costs | | | | |
| | a. Stanchion system | $17.25 | $12.75 | $ 9.30 | xxxx |
| | b. Loose housing - conventional parlor | 15.90 | 11.10 | 8.10 | $8.10 |
| | - herringbone parlor | xxxx | xxxx | xxxx | 5.85 |
| 12. | Dry cow care | | | | |
| | a. Stanchion system | $11.40 | $ 7.35 | $ 5.85 | xxxx |
| | b. Loose housing - conventional parlor | 10.35 | 6.45 | 5.10 | 5.10 |
| | - herringbone parlor | xxxx | xxxx | xxxx | 5.85 |
| Annual building costs per cow | | | | | |
| 15. | Silage storage and feeding[4] | $ 3.75 | $10.20 | $ 6.70 | $ 4.15 |
| 16. | Barns and lots | | | | |
| | a. Stanchion system | | | | |
| | Ungraded facilities[5] | $17.45 | $15.70 | xxxx | xxxx |
| | Grade A facilities, remodeled[6] | 34.25 | 25.00 | xxxx | xxxx |
| | Grade A facilities, new[6] | 58.70 | 54.00 | $50.60 | xxxx |
| | b. Loose housing, conventional parlor[7] | 35.85 | 39.50 | 30.60 | $23.95 |
| | c. Loose housing, herringbone parlor[7] | xxxx | xxxx | xxxx | 19.40 |

| Line no. | Item | Size of herd 15 cows | 30 cows | 60 cows | 120 cows |
|---|---|---|---|---|---|
| | Annual equipment costs per cow | | | | |
| 18. | Milking equipment | | | | |
| | a. Pail milker system[8] | $ 5.65 | $ 3.25 | $ 2.20 | $ 1.50 |
| | b. Pipeline system | | | | |
| | Stanchion barn[9] | 32.90 | 17.30 | 14.95 | xxxx |
| | Conventional milking parlor[10] | 13.90 | 7.80 | 4.30 | 2.60 |
| | Herringbone milking parlor | xxxx | xxxx | xxxx | 3.70 |
| 19. | Cooling equipment | | | | |
| | a. State average cows | | | | |
| | Can system[11] | $ 4.90 | $ 3.60 | $ 3.95 | xxxx |
| | Bulk system[12] | 12.00 | 8.45 | 5.60 | $ 4.35 |
| | b. DHIA average cows | | | | |
| | Can system[11] | 6.25 | 5.00 | 4.95 | xxxx |
| | Bulk system[12] | 16.90 | 9.60 | 7.40 | 5.50 |
| | c. Superior cows | | | | |
| | Can system[11] | 7.25 | 7.90 | 7.90 | xxxx |
| | Bulk system[12] | 16.90 | 11.15 | 8.70 | 6.00 |
| | Miscellaneous costs per cow per year | | | | |
| 21. | DHIA testing fees[13] | $ 8.00 | $ 5.80 | $ 4.70 | $ 4.15 |
| 22. | Veterinary fees | 5.00 | 4.00 | 3.00 | 2.00 |
| 23. | Bedding figures roughly $8 per cow per year in stanchion barns. Loose housing bedding ranges between $12 and $16 per cow per year[14] | | | | |
| 24. | Breeding fees $6 to $7 per cow | | | | |
| 29. | If desired, other income credits might be estimated such as a value for manure, a value for the calf, and a monetary estimate of the value of the dairy herd for harvesting crops that could not otherwise be utilized (for instance, the crop on non-tillable pasture land) | | | | |

## Bench Mark Footnotes

| | Level of milk production: State av. 64.8 cwt. | DHIA av. 102.46 cwt. | Superior av. 128.57 cwt. |
|---|---|---|---|
| 1/ Feed costs were based on prices for hay and hay equivalent at $20 per ton, pasture at $4 per month, and home-grown grain and supplement 5-3-2 ration at $2.25 per cwt. Quantities, based on DHIA averages, assume 2 lbs. hay per day per cwt. of body weight and grain as follows: | | | |
| a. All dry-lot feeding | | | |
| Grain per cow per yr., lbs. | 2400 | 3300 | 3900 |
| Hay equivalent per cow per yr., lbs. | 8760 | 8760 | 8760 |
| Grain at 2¼¢ per lb. | $ 54.00 | $ 74.25 | $ 87.75 |
| Roughage at 1¢ per lb. | 87.60 | 87.60 | 87.60 |
| Total, dry lot method | $ 141.60 | $ 161.85 | $ 175.35 |

| | Level of milk production | | |
|---|---|---|---|
| | State av. 64.8 cwt. | DHIA av. 102.46 cwt. | Superior av. 128.57 cwt. |
| 1/ (continued) | | | |
| b. Pasture, grain and hay equivalent | | | |
| Pasture days | 177 | 164 | 163 |
| Hay equivalent per cow per yr., lbs. | 4500 | 4500 | 4500 |
| Grain cost at 2¼¢ per lb. | $ 54.00 | $ 74.25 | $ 87.75 |
| Pasture at 13¢ per day | 23.00 | 21.75 | 21.25 |
| Roughage at 1¢ per lb. | 45.00 | 45.00 | 45.00 |
| Total, pasture grain and hay | $122.00 | $141.00 | $154.00 |
| 2/ Cow investment costs were based on a life expectancy of four milking years, and an average body weight of 1200 lbs. | | | |
| Initial cost | $250.00 | $350.00 | $400.00 |
| Salvage value at 15¢ per lb. | 180.00 | 180.00 | 180.00 |
| Net investment per cow | $ 70.00 | $170.00 | $220.00 |
| Annual costs per cow at 25% of net investment | 17.50 | 42.50 | 55.00 |
| Plus 4% interest, taxes, and ins. on initial investment | 10.00 | 14.00 | 16.00 |
| Annual costs per cow | $ 27.50 | $ 56.50 | $ 71.00 |

| | Size of herd | | | |
|---|---|---|---|---|
| | 15 cows | 30 cows | 60 cows | 120 cows |
| 3/ Labor costs were based on the following hours per cow per month. | | | | |
| a. Stanchion system | | | | |
| Milking labor, hrs./cow/mo. | 11.5 | 8.5 | 6.2 | xxx |
| Dry cow care, hrs./cow/mo | 7.6 | 4.9 | 3.9 | xxx |
| b. Loose housing, conventional parlor | | | | |
| Milking labor, hrs./cow/mo. | 10.6 | 7.4 | 5.4 | 5.4 |
| Dry cow care, hrs./cow/mo | 6.9 | 4.3 | 3.4 | 3.4 |
| c. Loose housing, herringbone parlor | | | | |
| Milking labor, hrs./cow/mo. | xxx | xxx | xxx | 3.9 |
| Dry cow care, hrs./cow/mo | xxx | xxx | xxx | 3.4 |

A rate of $1.50/hr. was used as a standard. Persons with family labor that could not otherwise be utilized might value labor at an altogether different rate.

| | | | | |
|---|---|---|---|---|
| 4/ Silage storage and feeding costs are based on a concrete stave or steel upright silo with a life of 25 yrs. | | | | |
| Construction costs | $700.00 | $1000.00 | $2000.00 | $3200.00 |
| Investment per cow | 46.67 | 33.33 | 33.33 | 26.67 |
| Annual cost per cow (@ 8%) | 3.75 | 2.70 | 2.70 | 2.15 |
| Unloading equipment cost | xxxx | 1500.00 | 1600.00 | 1600.00 |
| Investment per cow | xxxx | 50.00 | 26.67 | 13.35 |
| Annual cost per cow (@ 15%) | xxxx | 7.50 | 4.00 | 2.00 |
| Total silo annual costs per cow | 3.75 | 10.20 | 6.70 | 4.15 |

| | Size of herd | | | |
|---|---|---|---|---|
| | 15 cows | 30 cows | 60 cows | 120 cows |
| 5/ Ungraded stanchion barn facilities are assumed to be remodeled existing structures valued at. . . . . | $2,090 | $3,090 | xxxx | xxxx |
| Investment per cow . . . . . | 139 | 106 | xxxx | xxxx |
| Annual costs per cow (15% of value for dep'n., interest, repairs, taxes, and insurance) . . . . . | 17.45 | 15.70 | xxxx | xxxx |
| 6/ Grade A stanchion barn facilities. | | | | |
| a. Remodeled existing barn valued at. . . . | $3,000. | $4,800. | xxxx | xxxx |
| New milk house valued at . . . . . | 1,280 | 1,450 | xxxx | xxxx |
| Total investment. . . . . | 4,280 | 6,250 | | |
| Investment per cow. . . . . | 285 | 208 | xxxx | xxxx |
| Annual costs per cow (12% of value). . . | 34.25 | 25.00 | xxxx | xxxx |
| b. New stanchion barn construction costs. . | 7,500 | 14,300 | 27,400 | xxxx |
| New milk house valued at . . . . . | 1,300 | 1,900 | 3,000 | xxxx |
| Total investment. . . . . | 8,800 | 16,200 | 30,400 | xxxx |
| Investment per cow. . . . . | 587 | 540 | 506 | xxxx |
| Annual costs per cow (10% of value). . . | 58.70 | 54.00 | 50.60 | xxxx |
| 7/ Loose housing facility costs are based on the following: | | | | |
| a. Milking parlor and milk house | | | | |
| 1. Conventional parlor, size. . . . . | 4 abreast | 4-stall | 6-stall | 8-stall |
| New value of . . . . . | $3,200 | $7,200 | $9,400 | $12,600 |
| Investment per cow . . . . . | 213 | 240 | 157 | 105 |
| Annual costs per cow (12% of new value. . . . . | 25.55 | 28.80 | 18.85 | 1260 |
| 2. Herringbone parlor, size . . . . . | xxxx | xxxx | xxxx | 12-stall |
| Milking parlor and milk house. . . . | xxxx | xxxx | xxxx | 8,000 |
| Investment per cow . . . . . | xxxx | xxxx | xxxx | 6700 |
| Annual costs per cow (12% of value). | xxxx | xxxx | xxxx | 805 |
| b. Loafing shed, new construction area per cow, sq. ft. . . . . | 70 | 60 | 60 | 50 |
| Cost per cow . . . . . | $ 77 | $ 66 | $ 66 | $ 55 |
| Annual costs per cow (9% of new cost). . | 6.90 | 5.95 | 5.95 | 495 |
| c. Concrete in exercising and feeding area, sq. ft . . . . . | 500 | 2,000 | 9,000 | 18,000 |
| Total investment at 40¢ per sq. ft ... | $ 200 | $ 800 | $3,600 | $ 7,200 |
| Investment per cow . . . . . | 13.33 | 27.00 | 60.00 | 6000 |
| Annual costs per cow (5% of new cost). . | .70 | 1.35 | 3.00 | 300 |
| d. Watering facilities, total investment. . | $ 90 | $ 90 | $ 180 | $ 360 |
| Investment per cow . . . . . | 6 | 3 | 3 | 3 |
| Annual costs per cow (24% of new cost) . | 1.45 | .70 | .70 | .70 |
| e. Hay storage and feeding area at 2T/cow . sq. ft. of building. . . . . | 500 | 1,000 | 2,000 | 4,000 |
| New construction cost. . . . . | old barn | $ 900 | $1,800 | $3,600 |
| Investment per cow . . . . . | xxxx | 30 | 30 | 30 |
| Annual cost per cow (9% of new cost) . . | $ 1.25 | 2.70 | 2.70 | 270 |
| Total annual costs per cow for loose housing. . . . . | | | | |
| 1. Conventional milking parlor. . . . . | 35.85 | 39.50 | 30.60 | 2395 |
| 2. Herringbone milking parlor . . . . . | xxxx | xxxx | xxxx | 1940 |

| | Size of herd | | | |
|---|---|---|---|---|
| | 15 cows | 30 cows | 60 cows | 120 cows |
| 8/ Equipment costs with pail milkers | | | | |
| Number of milker units | 2 | 2 | 3 | 6 |
| New cost installed | $ 650 | $ 750 | $1,000 | $1,400 |
| Investment per cow | 45.33 | 25.00 | 16.67 | 11.67 |
| Annual costs per cow (13% of new cost) | 5.65 | 3.25 | 2.20 | 1.50 |
| 9/ Equipment costs with a pipeline milker installed in a stanchion barn | | | | |
| Number of milker units | 2 | 2 | 3 | |
| New cost installed | $3,800 | $4,000 | $6,900 | xxxx |
| Investment per cow | 253 | 133 | 115 | xxxx |
| Annual cost per cow (13% of new cost) | 32.90 | 17.30 | 14.95 | xxxx |
| 10/ Equipment costs with a pipeline milker installed in a conventional milking parlor | | | | |
| Number of milker units | 2 | 2 | 3 | 4 |
| New cost installed | $1,600 | $1,800 | $2,000 | $2,400 |
| Investment per cow | 107 | 60 | 33.30 | 20 |
| Annual cost per cow (13% of new cost) | 13.90 | 7.80 | 4.30 | 2.60 |
| Installed in a herringbone parlor | | | | |
| Number of milker units | | | | 6 |
| New cost installed | xxxx | xxxx | xxxx | 3,400 |
| Investment per cow | xxxx | xxxx | xxxx | 28.30 |
| Annual cost per cow (13% of new cost) | xxxx | xxxx | xxxx | 3.70 |
| 11/ Can cooler costs based on cooler and can costs as follows: | | | | |
| a. State average herd, size of cooler | 4-can | 8-can | 16-can | xxxx |
| New cost installed | $ 461 | $ 680 | $1,476 | xxxx |
| Investment per cow | 30.70 | 22.67 | 24.60 | xxxx |
| Annual cost per cow (16% of new cost) | 4.90 | 3.60 | 3.95 | xxxx |
| b. DHIA average herd, size of cooler | 6-can | 12-can | 24-can | xxxx |
| New cost | $ 587 | $ 935 | $1,856 | xxxx |
| Investment per cow | 39.13 | 31.16 | 30.90 | xxxx |
| Annual cost per cow (16% of new cost) | 6.25 | 5.00 | 4.95 | xxxx |
| c. Superior average herd, size of cooler | 8-can | 16-can | 32-can | xxxx |
| New cost | $ 680 | $1,476 | $2,952 | xxxx |
| Investment per cow | 45.33 | 49.20 | 49.20 | xxxx |
| Annual cost per cow (16% of new cost) | 7.25 | 7.90 | 7.90 | xxxx |

| | Size of herd | | | |
|---|---|---|---|---|
| | 15 cows | 30 cows | 60 cows | 120 cows |

12/ Bulk cooler costs are calculated as follows:

| | | | | |
|---|---|---|---|---|
| a. State average herd, size of tank. . . | 100 gal. | 200 gal. | 400 gal. | 800 gal. |
| New cost installed . . . . . | $1,500 | $2,115 | $2,785 | $4,360 |
| Investment per cow . . . . . | 100.00 | 70.50 | 46.42 | 36.33 |
| Annual cost per cow (12% of new cost) | 12.00 | 8.45 | 5.60 | 4.35 |
| b. DHIA average herd, size of tank . . . | 200 gal. | 300 gal. | 600 gal. | 1,200gal |
| New cost installed . . . . . | $2,115 | $2,395 | $3,690 | $5,500 |
| Investment per cow . . . . . | 141.00 | 79.83 | 61.50 | 45.83 |
| Annual cost per cow (12% of new cost) | 16.90 | 9.60 | 7.40 | 5.50 |
| c. Superior average herd, size of tank . | 200 gal. | 400 gal. | 800 gal. | 1,500 gal. |
| New cost installed . . . . . | $2,115 | $2,785 | $4,360 | $6,000 |
| Investment per cow . . . . . | 141.00 | 92.83 | 72.67 | 50.00 |
| Annual cost per cow (12% of new cost) | 16.90 | 11.15 | 8.70 | 6.00 |

13/ Testing fee calculations based on $5.50 per herd, per month plus 30 cents per cow per month.

14/ Bedding cost estimates based on approximately 1 ton of straw per cow per year in stanchion barns. Loose housing facilities usually require 1 1/2 to 2 tons of straw per cow per year.

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# POTENTIALS OF COW POOLS

by

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AN ABSTRACT OF A MASTER'S REPORT

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Department of Dairy Husbandry

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OF AGRICULTURE AND APPLIED SCIENCE

1960

The dairy industry is undergoing more rapid changes now than at any other time in its history. The number of farms milking cows is decreasing at a much larger rate than the reduction of total farms. In Iowa, this change has been at the rate of six times as many farmers not keeping cows as the number quitting farming.

With the emphasis on reduced cost of production, labor-saving devices are becoming more prevalent. The cost of these devices are such that a certain volume of milk is necessary to make it economically feasible to invest in this machinery.

Production per cow is continually increasing to the extent that total milk production has not been reduced for the United States as a whole, even though total cow numbers are much less.

Integration is a byword in agriculture today. The cow pool is a type of integration. The pools in operation present integration in varying degrees from a highly integrated form, as represented by the Walker-Gordon setup, to the slightly integrated operation of the Utah milking barns.

Pools could bring about many changes in the dairy industry. Some of these are: (1) a shift from Grade C to Grade A milk, (2) no additional investment is needed to make this shift, (3) the owner short on labor or who wants to retire is assisted, and efficiency of low-producing herds is improved through better management. The average cow in Iowa produced 6,480 pounds of milk, yet the average cow in Fashion Farm produced 9,000 pounds of milk the first year.

Integration will cause other changes. It will create a market for high quality roughage, a need for special units to raise calves and keep dry cows, and provide additional credit for the dairyman insofar as the pool facilities

are concerned. The dairyman will, however, be a lender of capital insofar as his investment in the cows is concerned.

Pools could tend to stabilize the fluid milk market, cause a surplus of Grade A milk, effect a change in present marketing methods, and affect the market in many other ways.

There are four principle types of pools in operation. The Walker Gordon type where owners still exercise considerable management over the cows. The cooperative milking barns of Utah, the cooperative pools, and the privately-owned pools are other types of cow pools.

Cow pools of the future may take on more of the aspects of large-scale dairy operations. Fashion Farm, the pool that has received the most publicity, is now operating with eastern investors owning 90 percent of the cows.

The location, herd size, breeds of cattle, and areas of integration must receive careful attention. The pool should be located in an area producing milk for manufacturing purposes with plenty of high quality roughage available.

Organizational problems should receive considerable attention. How well some of the organizational problems are solved will largely determine the success or failure of the pool in operation. Some of these problems are: financing the pool, competition, legal problems, and many others. If the pool is well promoted and cows should be signed up with a deposit for each cow placed in the pool held in escrow until a certain starting date for the operation, and the management is assured of cows to start with, as well as some financial help.

Interest in pools vary with the interest of the group promoting the pool. Feed manufacturing companies are interested from the standpoint of additional sales. The private manager and investor is interested strictly in profit or

return on investment. The food distributor is interested in a constant steady large volume of high quality products for sale to the housewife.

The dairyman furnishing the cows to the pool should give careful consideration to several points. First, is there a market for the time and labor saved by using the pool? This, in many cases, includes the wife's labor. Second, is there a market for the roughage that will not be marketed through the cows? Third, can other enterprises be increased in size? Fourth, what about capital to increase this enterprise? These are but a few of the questions a farmer must answer before deciding the merits of the pool for him. Reading the pool contract will answer many of these questions. Answers to other questions will depend on the method of figuring income, such as cash in the bank balance, or whether all costs are figured.

The managerial ability of a pool operator must be excellent. He must be a good cow man, know how to keep and interpret records, be a good public relations man, and be able to organize the details of the various jobs to be performed. He must get the best out of his labor, especially in the milk barn.

There is no reason to believe that pools cannot succeed because of management problems. Large-scale dairy operators in Arizona, California, and Florida are handling satisfactorily more cows than any of the present pool operators. Lack of good management can cause a pool to cease operation in short-order if careful attention is not given to herd health, milk sanitation, breeding and labor.

Sample budgets should be prepared showing both an investment budget and an operational budget. The cost of various parts of the pool may be reduced by shopping around for materials. The pole-type barns at Modern Dairy cost 75 cents per square foot, while the barns at the Neosho Valley Cooperative pool cost $1.25 per square foot.

Most of the present publicity has been about the Fashion Farm pool, which has been in operation since August, 1958. It is still too early to make definite conclusions about cow pools. One can be sure that a pool needs good cows, top management, large quantities of quality hay and a supply of cows if it is to succeed. Pools will be on a dry-lot feeding basis and will be most likely to develop in areas where Grade C milk is now being sold.

It would appear that pools will have little affect on the market so long as the market is not closed to the smaller efficient dairyman, who is operating a unit on a sound basis.