ARTIFICIAL BREEDING ASSOCIATIONS

Financial and General Information

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by

D. Curtis Mumford
I. R. Jones
and
H. P. Ewalt

AGRICULTURAL EXPERIMENT STATION
OREGON STATE COLLEGE
Wm. A. Schoenfeld, Director
Corvallis
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The following presents pertinent information that Dairymen should have in considering membership in an artificial breeding association, including an estimate of the probable costs and returns.

A. Adding Milk Cows to Replace Sires.

1. Example No. 1 - Small dairy herd of 10 cows and one $150 bull.

   a. Replace bull with one additional cow. Member of association would then have 11 cows compared to non-member with 10 cows and one bull.

   b. Receipts: Member would have increased income of $150 (estimated 300 lbs. butterfat x an assumed price of 50 cents per pound. It is recognized that the price of butterfat may be higher or lower during the next few years.)

   c. Expenses: Member would have no additional expense for feed or labor. Cost of belonging to association first year $142 (Membership fee $10; 11 capital certificates at $5 each = $55; and 11 insemination fees at $7 each = $77). The $10.00 membership fee is paid only once. The $55 for capital certificates represents an investment in the association and is not an operating charge. After the first year the association cost would be $77 per year.

   d. Summary: Thus each member of the breeding association should show each year a gain in operating net income of $73 ($150 minus $77). During the first year this would be more than enough to pay for the initial investment of $55 in capital certificates and the $10 membership fee.

2. Example No. 2 - Medium-sized dairy herd of 25 cows and one $300 bull.

   a. Replace bull with two additional cows. This is a more valuable bull than considered under example No. 1. Because of the larger number of cows, more labor has been required to service the herd and the bull has required more feed and care. It is possible that the addition of two cows might require certain adjustments in barn space. Member of association would then have 27 cows compared to non-member with 25 cows and one bull.
b. **Receipts**: Member would have increased income of $300 (300 lbs. butterfat x 2 cows x an assumed price of 50 cents per pound. It is recognized that the price of butterfat may be higher or lower during the next few years.)

c. **Expenses**: Member would have no additional expense for labor but it would require an estimated additional feed cost of $70 for one of the additional cows. The cost of belonging to the association the **first year** would be $334 (Membership fee $10; 27 capital certificates at $5 each = $135; and 27 insemination fees at $7 each = $189). The $10 membership fee is paid only once. The $135 for capital certificates represents an investment in the association and is not an operating charge. After the **first year** the association cost would be $189 per year.

d. **Summary**: Thus each member of the breeding association should show each year a gain in operating net income of $41 ($300 additional income from sale of butterfat minus $70 for extra feed and minus $189 for insemination fees).

3. **Example No. 3** - Large dairy herd of 100 cows and four $300 bulls.

   a. **Replace** four bulls with eight additional cows. Member of association would then have 108 cows compared to non-member with 100 cows and four bulls.

   b. **Receipts**: Member would have increased income of $1200 (300 lbs. butterfat x 8 cows x an assumed price of 50 cents per pound. It is recognized that the price of butterfat may be higher or lower during the next few years.)

   c. **Expenses**: Member would have approximately the same expense for labor but it would require an estimated additional feed cost of $280 for four of the additional cows (4 cows x $70). The cost of belonging to association the **first year** would be $1306 (Membership fee $10; 108 capital certificates at $5 each = $540 and 108 insemination fees at $7 each = $756). The $10 membership fee is paid only once. The $540 for capital certificates represents an investment in the association and is not an operating charge. After the **first year** the association cost would be $756 per year.

   d. **Summary**: Thus each member of the breeding association should show each year a gain in operating net income of $164 ($1200 additional income from sale of butterfat minus $280 for extra feed and minus $756 for insemination fees).

B. **Raising Butterfat Production By Service to Proved Sires**.

In the foregoing discussion no consideration has been given to the added returns a dairyman should expect through raising the average butterfat production of the daughters over their dams as a result of service to high quality bulls in the association.
Let us take a specific example of a 10-cow dairy herd where normally two heifer calves are saved each year for replacements. Two cows are sold every year to make room for the two young heifers coming fresh. Under this system of replacements, the productive life of each cow would be five years. At the end of the eighth year after joining the association all of the 10 cows in the herd would have been sired by association bulls and would have completed from one to five lactations.

Now let us assume that on the average, each heifer calf raised will grow into a cow that will produce 20 lbs. more butterfat than her dam.* It would be the beginning of the fourth year after taking out membership in the association before the dairyman would get the additional income from the sale of increased butterfat production. In this fourth year, according to our assumptions, there would be 40 lbs. of additional butterfat to sell (2 cows x 20 lbs. butterfat). In the fifth year two new cows would be added to replace two older cows, and therefore, the amount of butterfat sold would be 80 lbs. more than in the year prior to joining the association. During each of the sixth, seventh, and eighth years an additional 40 lbs. of butterfat would be produced and sold. Therefore during the eighth year (from the time of joining the association) the farm would sell 200 lbs. more butterfat than originally was the case. The total increased butterfat sold during the eight years would amount to 600 pounds.

If we consider this 600 pounds of butterfat worth 50 cents per pound there would be an additional income of $300 during the eight years. Only negligible amounts of additional feed, if any, would be required by the better bred cow to produce the additional 20 pounds of butterfat each year. During the eight years in which 10 calves would be born and develop into cow replacements, there would be 10 cows bred each year or a total of 80 insemination fees to be paid. Dividing $300 by 80 gives a figure of $3.75 which is the amount that a dairyman could pay for each insemination solely upon the basis of an estimated average increase of 20 pounds of butterfat annually for each daughter over her dam. Dairymen should clearly recognize that the value of increased production per cow is in addition to the net benefits derived from adding additional cows to the herd as already considered under "A".

Raising the level of milk and butterfat production per cow through inheritance is the most effective and least expensive method available to a dairyman for increasing net profits from his herd. The use of proved or high transmitting index sires will result not only in increased production in their daughters but through better inheritance, the daughters will, in turn, transmit increased production to their offspring.

* Reports from the New Jersey, New York and Maine Agricultural Experiment Stations show that the first cows resulting from artificial breeding have produced on the average 40 pounds additional butterfat as compared to their dams.
In addition to the advantages of artificial breeding as a sound financial investment it has many other features. An important one of these is the elimination of danger to dairymen and members of their families in keeping and handling herd sires. Bulls of serviceable age are extremely dangerous animals. Newspaper accounts of people killed or injured by bulls verify this fact. Membership in an artificial breeding association represents cheap life and accident insurance.

C. Cost of Keeping a Herd Sire.

On the basis of facts reported in Oregon Agricultural Experiment Station Bulletin 312, COST OF KEEPING DAIRY HERD SIRES AND SUGGESTIONS ON THEIR SELECTION AND MANAGEMENT, it is estimated that the average annual net cost (1945) of keeping a herd sire in Oregon is approximately $123. In this estimate the sire has been valued at $120 and has been credited with outside service fees and the value of manure produced. For bulls of higher valuation there would be additional costs for interest and depreciation of at least $25 for each $100 increase in valuation.

D. General Information on Artificial Breeding.

1. Advantages:
   a. Makes possible wider use of proved or high transmitting index sires.
   b. Small dairy has the opportunity to breed to these higher quality sires.
   c. Eliminates danger of handling bull.
   d. Reduces possibility of spreading genital diseases.
   e. The overall sire cost is less in association breeding as compared to owning a bull.
   f. Results in more complete breeding records and more accurate knowledge of when to turn cows dry.
   g. Increases net profits from the dairy enterprise by raising the level of production per cow.

2. Limitations:
   a. Dairyman must have cow in barn, identify her for the inseminator and call the inseminator for service.
   b. Insemination fee must be paid at time of first service.
   c. Approximately 1000 cows must be signed up in a radius of 15 miles to insure successful operation.
   d. A member cannot request service from any one definite bull.
3. Bulls:
   a. Must have a high level of fertility and transmitting ability. Efforts will be made to have bulls with a sire index of 450 lbs. butterfat or better, based on 305 days, two-time milking for a mature cow.
   b. Must become adapted to artificial use and purchased subject to trial.
   c. Semen collections must be made on schedule, not more frequently than every fifth day.
   d. A central bull stud for all local units is the most economical.

4. Semen:
   a. Must have high initial motility and good keeping quality.
   b. Is carefully cooled to $40^\circ - 44^\circ$ F. for storage until used.
   c. Semen is usually diluted with egg yolk, buffered solution.
   d. May be diluted as high as 1-20. Usual dilution 1-6.
   e. Usually 1 cubic centimeter of diluted semen is used per insemination.
   f. Common practice is to use semen not over three days old.
   g. Calves have been produced with 10-day-old semen.
   h. Semen may be diluted, cooled and shipped any distance as long as the temperature remains the same.

5. The cow:
   a. Usually remains in heat 10 to 24 hours and normally longer periods in summer than in winter.
   b. Insemination may be made the day following evidence of heat. Inseminations late in heat period are more effective than early in heat period.
   c. All calls received up till noon are taken care of that day while afternoon calls are usually taken care of the following day.
   d. Cows must be watched more carefully for heat periods under this method of breeding.
   e. Under natural service conditions directly to a sire an average of two services are required for each calf born.
f. Artificial insemination is just as efficient as natural breeding and sometimes better because all semen is examined before use while a bull may not always deliver high quality semen.

g. "Difficult breeding" cows cannot be settled any easier by artificial breeding than by natural service with a sire.