A vocational agriculture teacher's analysis of artificial insemination of dairy cows in West Tennessee

Melvin Isaac Revelle

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To the Graduate Council:

I am submitting herewith a thesis written by Melvin Isaac Revelle entitled "A vocational agriculture teacher's analysis of artificial insemination of dairy cows in West Tennessee." I have examined the final electronic copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science, with a major in Agricultural and Extension Education.

A. J. Paulus, Major Professor

We have read this thesis and recommend its acceptance:

George W. Weigers, Jr., M. A. Sharp

Accepted for the Council:

Carolyn R. Hodges

Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)
August 3, 1956

To the Graduate Council:

I am submitting herewith a thesis written by Melvin Isaac Reveille entitled "A Vocational Agriculture Teacher's Analysis of Artificial Insemination of Dairy Cows in West Tennessee." I recommend that it be accepted for nine quarter hours of credit in partial fulfillment of the requirements for the degree Master of Science, with a major in Agricultural Education.

[Signature]
Major Professor

We have read this thesis and recommend its acceptance:

[Signature]
[Signature]

Accepted for the Council:

[Signature]
Dean of the Graduate School
A VOCATIONAL AGRICULTURE TEACHER'S ANALYSIS

OF ARTIFICIAL INSEMINATION OF DAIRY COWS IN WEST TENNESSEE

A THESIS

Submitted to
The Graduate Council of
The University of Tennessee
in
Partial Fulfillment of the Requirements for the degree of
Master of Science

by

Melvin Isaac Revelle

August 1956
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Grateful acknowledgement is given to the members of the Agricultural Education Department of The University of Tennessee, Dr. A. J. Paulus, Dr. George Weigers, Jr., and Robert Wambrod. Without their assistance, it would have been an almost impossible task to prepare this thesis. Dr. M. A. Sharp, Head of the Agricultural Engineering Department of The University of Tennessee, assisted by serving on faculty committee.

The following men have offered encouragement and given assistance in various ways: H. C. Colvett, W. H. Smith, R. S. Freeman, Edward Jones, O. B. Pope, Joe Pope, Harvey McEwen; William G. Spence, Dr. E. W. Swanson, Lynn Copeland, Clyde Chappell.

The Vocational Agriculture teachers of West Tennessee gave valuable aid by answering the questionnaire mailed to them.

M.I.R.
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dent upon high producing bulls with desirable type in this study. It was necessary for all aspects of the program to be improved as soon as feasible. Future Farmers training for dairy farming used this service almost exclusively. The study was to show some of the good and weak aspects of the West Tennessee Artificial Breeding Association, and the services teachers of Vocational Agriculture might render farmers and boys in understanding and operating the program.

Scope of the Study

This study was limited to the West Tennessee Artificial Breeding Association and local associations securing semen from this Association.

Assumptions

1. The West Tennessee Artificial Breeding Association has served the dairy breeding needs of the area included in its operation.

2. The early interest in Jersey Cattle and the Yorkville Jersey Show showed evidence of interest in better dairy cattle.

3. The West Tennessee Artificial Breeding Association should use proved bulls.

4. There are opportunities for expansion of the service in West Tennessee.

5. The physical plant is adequate for anticipated needs.
6. The freezing of semen may revolutionize the operations of the Association.

7. Private competition may do harm to the Association.

8. The teacher of Vocational Agriculture can render valuable service to adult farmers and all-day boys through the teaching and supervision of undertakings in the dairy enterprise.

9. Teachers of Vocational Agriculture are interested in the West Tennessee Artificial Breeding Association.

Method of Procedure and Source of Data

The early history of the Jersey breed in the Yorkville Community was secured from older men of the community who had been active in the breeding of Jersey cattle, the Yorkville Jersey Show, the Yorkville Cooperative Breeding Association, and the West Tennessee Artificial Breeding Association.

The author had just begun his first year as vocational agriculture teacher in the Yorkville Community when the first Jersey Cattle Show was held in 1929. He has had active experience in the later developments and in the organization of the West Tennessee Artificial Breeding Association. Those experiences were utilized in this study.

The newspaper accounts of the Jersey Show, Yorkville Cooperative Breeding Association, and the West Tennessee Breeding Association have been reviewed and utilized in this study. The minutes of these organizations have been used for factual data. The
official records of the Yorkville and West Tennessee Breeding Associations have been studied and used. The records of the Gibson County Dairy Herd Improvement Association have been compiled and utilized for production records of animals resulting from artificial insemination and records of their dams if available. Classifications of bulls in the stud and animals resulting from artificial insemination were taken from official classifications made by the American Jersey Cattle Club. The financial records were taken from the official report of the treasurer of the organization to the membership. Authorities and Experiment Station reports were reviewed for factual data on artificial insemination.

Magazines, breed publications, and census data were also used in the study.

A check was made with the vocational agriculture teachers of West Tennessee to secure information as to what they had done to help the artificial breeding program, the teaching they had done, their promotion work, prospects for increasing the service area, and to get their criticisms of the service in general.

The procedure used was to secure data from the records and people interviewed; organize the author's experiences and combine them with the experiences and judgments of other teachers of vocational agriculture in West Tennessee and bring them together to tell a continuous story of what has happened giving the background and the situation at the time the study was made, and projecting into the future of the West Tennessee Artificial Breeders' Associa-
tion. Then from these formulate some meaningful suggestions or
guides for teachers of vocational agriculture in this aspect of
their program.

Definition of Terms

"Abnormalities" refer to any parts of the cow's reproductive
tract that are not normal.

"Adult Classes" are classes of organized instruction for
farmers taught by vocational agriculture teachers.

"All-day Boys" refer to high school boys studying vocational
agriculture in regular classes.

"A. B. Proved Daughters" are the daughters of a bull from
artificial breeding having production records.

"Artificial Breeding" means artificial insemination.

"Artificial Insemination" refers to the procedure of placing
semen in the reproductive tract of the cow by artificial means.

"Blood Test" is the taking of a blood sample from the cow
and running a laboratory test for the germ, Brucellosis abortus Bang.

"Bull Association" was organized by a number of communities
buying bulls, using them in natural service for about two years,
then exchanging bulls with another community.

"Bull Stud" refers to the headquarters of the West Tennessee
Artificial Breeding Association of the headquarters of a central
association where the bulls are kept.

"Central Association" refers to the West Tennessee Artificial
Breeding Association or a similar organization.

"Class": A group of animals of similar age, sex, etc., in a show.

"Classification": an official judgment of the breed association placing cows as Excellent, Very Good, Good, Fair, or Poor according to a score card of type.

"Conception Rate": the per cent of cows which conceive as a result of first insemination.

"Cooperative": an organization where each member has one vote and shares in the profits according to the amount of business done with the organization.

"Cow Family": the females in a bull's family for three or more generations.

"Cyst": an abnormal growth on the ovary of a cow.

"Dairy Herd Improvement Association": a group of dairymen organized, employing a tester and having him visit their herd once each month testing for butterfat, weighing the milk, and calculating the feed cost and returns from each cow.

"Dam": the mother of an animal.

"Estrus": the period, usually twelve to fourteen hours, when a cow will accept the natural service of a bull.

"Frozen semen": semen that has been frozen by careful steps and kept at minus 110 degrees either with dry ice or a special refrigerator.

"Get of Sire": four animals in a show having the same sire.

"Grade": animals showing a predominance of one breed but not
subject to registration in that breed.

"Grade 'A' Milk": milk produced under strict sanitation for consumption without going through a manufacturing process.

"Junior Show": a show for Future Farmers and 4-H Club members exclusively.

"Lactation": the period a cow gives milk from calving until she goes dry.

"Local Association": a member association of the central association employing their own technicians and purchasing semen from the central.

"Natural Service": the bull inseminates the cow.

"Official Testing": testing done by an employee of a breed association and recorded in their records.

"Ovary": the organ that produces the egg.

"Pedigree": a written record of an animal's immediate ancestors for two or three generations. In dairy animals it includes production, type, show winnings and prices when sold.

"Produce of Dam": two females of any age out of one cow.

"Production Level": the average production of all of the cows in a herd.

"Production Record": the pounds of milk and butterfat produced during one lactation and the per cent butterfat the milk tested.

"Proved Bull": a bull having production records on ten or more of his daughters.
"Registered": an animal whose credentials have been recorded with a recognized breed association.

"Semen": the viscid whitish fluid produced in the male reproductive tract containing the male reproductive cells.

"Service Fee": the money charged for inseminating a cow.

"Sire": the father.

"Solid Pedigree": every animal for two of three generations having enough production records and classifications to adequately show their ability as to type and production.

"Technician": the person who inseminates the cow.

"West Tennessee Artificial Breeding Association": the central organization for the production of semen for five local associations in northern West Tennessee. The headquarters are at Yorkville, Tennessee.

"Yellow Body or Corpus Luteum": the mass of tissue that forms from a ruptured follicle in the ovary.
CHAPTER II

REVIEW OF RELATED LITERATURE

History

It was necessary to give a brief history of artificial insemination in the United States and its development in other countries before it was introduced into this country to give a background for the West Tennessee Artificial Breeding Association. The history of artificial insemination of dairy cattle in this country was rather brief, being introduced in 1938. Peterson gave this summary:

The Arabs are reported to have artificially bred mares six centuries ago and for more than 150 years, it has been known that the introduction of semen into the reproductive tract at the right times will produce conception in many species.

The idea of using artificial insemination extensively in the breeding of dairy cattle, however, is of recent origin. The Russians are credited with developing the practical aspects, based upon the discovery that semen may be preserved by cooling. This work began in Russia about 1901, when certain studs used artificial insemination in practice. Beginning about 1923, this method of breeding became more widespread and by 1938, about 1,500,000 cattle, approximately 5 per cent of all cattle in Russia, were artificially inseminated.

Denmark was the next country to introduce artificial insemination of cattle on a large scale. The work started in 1936 and by 1947, approximately 50 per cent of the inseminations of cows were artificial. The first artificial

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insemination society in the United States was organized by E. J. Perry following his return from Denmark where he became impressed with the idea of its potentialities. Since that time in spite of the intervening war years, the growth has been steady.

The growth of artificial insemination of dairy cows in the United States grew from 7,539 cows inseminated in 1939 to 5,413,784 in 1955, or according to Herman 2 about twenty per cent of the total number of dairy cows. On January 1, 1956, there were 661,497 herds enrolled in 1,502 artificial breeding organizations. Wisconsin led with 1,000,293 cows. Minnesota was second with 495,330. Pennsylvania, New York, Ohio, Iowa, Illinois, California, Michigan, and Indiana ranked in the order named. Tennessee with 55,233 cows bred artificially or about eight per cent of the total number of dairy cows, ranked twentieth in the United States. Table I shows the growth of artificial insemination in the United States by years 1939-1955.

Swanson 3 stated that the first artificial insemination association in the south was the Maury-Williamson Association in those two Tennessee counties. It was later superceded by the Tennessee Artificial Breeders Association which served all of Middle Tennessee. In 1940, a new type of organization was developed in New York state. A large bull stud was established at a central

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### TABLE I

**GROWTH OF ARTIFICIAL BREEDING OF DAIRY COWS IN THE UNITED STATES 1939-55**

<table>
<thead>
<tr>
<th>Year (Jan.1)</th>
<th>Number of Organisations</th>
<th>Number of Herds in Service</th>
<th>Number of Sires in Service</th>
<th>Number Cows Bred per Year Total</th>
<th>Per Sire</th>
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<tr>
<td>1939</td>
<td>7</td>
<td>636</td>
<td>33</td>
<td>7,539</td>
<td>228</td>
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<tr>
<td>1940</td>
<td>30</td>
<td>2,971</td>
<td>138</td>
<td>33,977</td>
<td>216</td>
</tr>
<tr>
<td>1941</td>
<td>42</td>
<td>5,997</td>
<td>237</td>
<td>70,753</td>
<td>299</td>
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<tr>
<td>1942</td>
<td>73</td>
<td>12,116</td>
<td>1,12</td>
<td>112,702</td>
<td>274</td>
</tr>
<tr>
<td>1943</td>
<td>59</td>
<td>23,446</td>
<td>574</td>
<td>182,524</td>
<td>318</td>
</tr>
<tr>
<td>1944</td>
<td>95</td>
<td>28,627</td>
<td>657</td>
<td>218,070</td>
<td>322</td>
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<tr>
<td>1945</td>
<td>135</td>
<td>43,998</td>
<td>729</td>
<td>360,732</td>
<td>495</td>
</tr>
<tr>
<td>1946</td>
<td>336</td>
<td>73,293</td>
<td>900</td>
<td>537,376</td>
<td>977</td>
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<tr>
<td>1947</td>
<td>608</td>
<td>110,571</td>
<td>1,153</td>
<td>1,181,168</td>
<td>615</td>
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<tr>
<td>1948</td>
<td>963</td>
<td>224,93</td>
<td>1,745</td>
<td>1,713,561</td>
<td>962</td>
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<td>1949</td>
<td>1,263</td>
<td>316,177</td>
<td>1,940</td>
<td>2,091,175</td>
<td>1,078</td>
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<td>1950</td>
<td>1,660</td>
<td>372,968</td>
<td>2,104</td>
<td>2,619,555</td>
<td>1,245</td>
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<td>1951</td>
<td>1,653</td>
<td>667,221</td>
<td>2,187</td>
<td>3,509,573</td>
<td>1,605</td>
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<td>1952</td>
<td>1,680</td>
<td>513,397</td>
<td>2,324</td>
<td>3,995,332</td>
<td>1,818</td>
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<tr>
<td>1953</td>
<td>1,623</td>
<td>571,921</td>
<td>2,598</td>
<td>4,155,222</td>
<td>1,865</td>
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<tr>
<td>1954</td>
<td>1,432</td>
<td>606,997</td>
<td>2,661</td>
<td>5,155,240</td>
<td>1,937</td>
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<tr>
<td>1955</td>
<td>1,476</td>
<td>593,190</td>
<td>2,450</td>
<td>---</td>
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location to service local associations.

Agencies Involved

Agencies or groups responsible for the organization of breeding associations have varied from state to state and within a state. However, in most cases the State Dairy Department and Extension Service have taken the lead.

Herman gave the agencies sponsoring the associations in Missouri as: The Department of Dairy Husbandry; Farm Security Administration, Chambers of Commerce; Missouri Farmer's Association.

Frye found that the greater number of organizations inseminating dairy cattle were farmer cooperatives. The Cooperatives were local, federation of locals, or large centralized cooperatives.

Organization and Finance

As indicated by Herman, Frye, Peterson, and others, the


8 Frye, "Review of Artificial Breeding Program in the Southeastern States," Talk made before Dairy Section, Southern Association of Agriculture Workers, Memphis, 1951.

9 Peterson, op. cit., p. 265.
trend was toward larger central associations with ten or more bulls. These central studs owned and maintained bulls, processed and shipped semen to local associations, had a laboratory and office equipment. It was found that outside capital invested in central associations was undesirable. Some central associations produced semen for more than one hundred thousand cows.

The locals hired technicians and bought semen from their central association. The local should inseminate at least one thousand cows per year. Technicians hired on a commission or salary and bonus basis proved more satisfactory than on salary alone. Membership, service, and cow assessment fees financed the program in most states. For areas that had less than one thousand cows, a technician could be hired part time until the one thousand or more cows were enrolled.

Bankers in a study of the financial structure of the Minnesota Artificial Breeding Association, reported that the capital investment of the central association was considerable. It was discovered that a large part of the capital was outside capital and that this was undesirable. The central bull stud had the cost of manager's and helper's salaries, purchased bulls, feed and care of bulls, depreciation on the bulls, operating supplies, and fees for directors and bull committees. The three major items

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of cost in the locals were the technician's salary, mileage, and the outlay for semen. More cows concentrated in a smaller area lessened the overall expenses.

Some of the essentials in setting up an artificial insemination program for successful operation were discussed by Peterson. Artificial insemination societies vary from small units having one inseminator and breeding as few as 1,000 cows, to statewide organizations employing scores of inseminators and breeding more than 100,000 cows annually. The trend is toward the organization of larger units, where the cow service cost is reduced. For the same reason better and higher priced bulls may be obtained. The larger unit has a lower cost of maintenance per bull and can also have better laboratory facilities and technicians.

A minimum of 1,000 cows within a radius of 15 to 20 miles has been set as the lower basis for a unit to succeed. Good inseminators with uniform distribution of breeding throughout the year can handle 3,000 or even more cows within a radius of 20 miles. Adequate finance is another important factor the lack of which has caused many associations serious difficulties.

Problems Encountered

Selecting Bulls

As related by Johnson and Herman, the problem of selecting sires for an artificial insemination stud was serious.

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11 Peterson, op. cit., p. 265.


and as yet no fool proof method had been discovered. The level of production of naturally sired daughters was not a very good indication of the true evaluation of a bull in artificial service. The bull in artificial service was used on a random assortment of cows with all shades of production and type and various conditions of feeding and management. The most dependable proof on a bull was the average performance of his artificially sired daughters. In New York, bulls could be ranked on the production of daughters when they had twenty to fifty reported and be fairly certain that the top one-third would continue to remain in the top one-half and the lower one-third would remain in the lower half. Another answer was to use young sires on a few hundred cows in scattered herds until they were proved, then return them to the stud for heavy service. Of the 2,540 sires in Artificial Breeding Associations during 1955, 883 or about 36 per cent were proved.

Wolburg discussed the problem of selecting sires thus:

1. Inheritance is overestimated and feeding and management is underestimated.
2. Good solid pedigrees on any sire were hard to find. The depth of good breeding behind them was not emphasized enough.
3. Records other than production were hard to get, such as, temperament, abnormalities, longevity and body conformation.
4. His daughters could have had different conditions from their dams when the dam's records were made.
5. Daughter and dam comparisons could be misleading, as there should have been ten or more pairs tested; the number of

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herds, the more herds the better; the number of daughters which increased and the number that decreased the dam's production; a sire could be proved easily on low producing dams.

Wolburg in studying the records of fifteen bulls that raised production by 100 pounds and fifteen that lowered it by 100 pounds, found only one definite trend and that was in the cow family. The good bulls had a strong cow family for three generations while only one of the poor bulls had a good cow family.

Schaeffer\(^{15}\) reported a study made in New York on the value of records of naturally proved sires in artificial breeding. In an analysis of sixty-two bulls, those with a record of less than 400 pounds fat in artificial breeding, had natural daughters averaging 423 pounds fat. Those with 400 to 450 pounds fat in artificial breeding had natural daughters averaging 428 pounds fat. The top sires with natural daughters averaging over 500 pounds fat, had an average of 429 fats in artificially sired daughters.

Testing

Herman\(^{16}\), in a comparative study of artificial insemination in the United States and Denmark, reported that about five per


\(^{16}\)H. A. Herman, "Will We Follow the Danes," Board's Dairyman, 100:72 March 10, 1955.
cent of the cattle in the United States were tested for production, while in Denmark, fifty-nine per cent were tested. The results of artificial insemination could be measured much more accurately in Denmark. About seventy-five per cent of the Danish cattle were inseminated artificially. In the United States twenty per cent were artificially bred.

**Type**

Block\(^{17}\) insisted that type be given consideration along with production in selecting and evaluating bulls. His idea of type was much more than winning in a show ring. It included strong muzzle and head, plenty of capacity, udders with size, correct shape and quality and staying ability, and legs without defects. Type would be important in selling surplus cattle. The associations that paid attention to type would by-pass those organizations ignoring it.

The American Jersey Cattle Club\(^{18}\) in a study of the relation of production and type made a report on the production level of the several classification brackets arrived at by simple averages of records calculated to the 2x305 day mature equivalent basis. The results follow:

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No Choice of Bulls

A disadvantage of artificial insemination mentioned in almost every study reviewed, was that the farmer could not have his choice of bulls used on his cows.

Swanson had a different view of the situation. He gave the advantages of a farmer not having a choice of bulls:

The usual practice is to secure the best bulls obtainable regardless of family lines. The result is that the typical bull stud of an artificial breeding association contains bulls of many blood lines which may have resulted from all types of breeding systems. It is clear that inasmuch as uniformity is due to immediate ancestors, artificial breeding will decrease uniformity. On the other hand, the bulls used will have been carefully selected according to a single score card criterion, or purpose and they will not differ greatly in their effect on their progeny. So any non-uniformity that appears may not be any more than is often found among the daughters of a single herd sire bred to females not closely related.

The tragedy of using poor bulls in a fine herd for two or three years and destroying generations of breeding effort at one stroke cannot happen in a well managed artificial breeding cooperative. Some undesirable sires may unwittingly be used, but each patron will have only a few of his offspring and culling them will not be the major operation that it would be had the bull been used naturally alone in the herd for two years.

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19 Swanson, op. cit.
Reasons for Removing Bulls from Studs

Herman\(^{20}\) grouped the main reasons for bulls being removed from service in bull studs under four general headings: low quality semen and refusal to work; physical reasons accounted for twenty-nine per cent, such as old age and bad feet; disease and ailments accounted for only fourteen per cent; low producing daughters and replacement by better bulls removed many bulls from the studs.

Conception Rates

Herman\(^{21}\) related that at the beginning of artificial insemination in this country the non-return rate was fifty to fifty-five per cent, now this rate is seven out of ten, or seventy per cent. Technicians with experience believed that all healthy cows inseminated with healthy semen at the proper stage of heat will settle on the first two services.

Harvey\(^{22}\) found the cow four to six times more important than the bull in determining whether or not pregnancy resulted from a single service.


Erb\textsuperscript{23} believed that under carefully controlled sire fertility, as was generally practiced in artificial insemination associations, the sire was likely several times less important than observed by Harvey.

Bush\textsuperscript{24} reported low conception rates to be the result of several conditions:

In a study of the artificial breeding program in Kentucky revealed that about eighteen per cent more cows conceive with the first service when breeding was delayed for two months following calving as compared with cows which were bred at five weeks or less after calving. Of 813 cows bred at five weeks or less after calving 50.9 per cent conceived on first service. At six weeks 2,134 cows conceived or 61.6 per cent. At three months the conception rate on 1,761 cows was 69.6 per cent. When bred four months or longer, the conception rate on 2,638 cows was 68.6 per cent.

Trimberger and Davis\textsuperscript{25} in a study to determine the effect of time of service on conception, bred 285 cows by artificial insemination at various stages of estrus with the following results:

The breeding results, expressed as percentages of conception from one insemination in the female bred at various stages of estrus, were as follows: Start of estrus, 41.0; Middle of estrus 62.5; End of estrus, 75.0; 6 hours after estrus ended, 62.5; 12 hours after estrus ended, 32.0; 18 hours after estrus ended, 28.0; 24 hours after estrus ended, 8.0; 36 hours after estrus ended, none conceived.


Staff reviewed the literature on causes of reproductive troubles in cows and reached these conclusions:

1. When a cow is successfully bred, the yellow body remains in the ovary throughout pregnancy and for thirty to ninety days after healthy calving. After that the tissue shrivels and the cow comes in heat again. Sometimes a yellow body will persist even when the cow has not conceived, and the continued presence of the yellow body, or corpus luteum, prevents a recurrence of heat. The removal of the yellow body by a veterinarian will cause the cow to come to heat.

2. Some cows have heat periods at very short intervals, or have heat periods that last for a number of days. This condition is due to the formation of a cyst in the ovary. The veterinarian may be able to correct this condition by rupturing the cyst.

5. If the cow aborts at about seven months after being bred, the first thing to do is to determine definitely whether the abortion is due to contagious abortion by the germ known as bacillus abortus Bang. The only way to do this is by blood test of cows.

Staff also discussed some other factors involved with breeding difficulties such as breeding heifers too young; twinning; poor feeding; abnormalities of the reproductive tract; retained afterbirths; the need for a veterinarian to diagnose and treat cows.

Bartlett reported that vibriosis was a veneral infection. Infected bulls used in artificial insemination caused over ten per cent more returns per cow, unless antibiotic were added to

26 Charles Staff, "Breeding Difficulties of Cattle," Larro Research Farm, General Mills, Inc., 1945, p. 3 ff.

Beef Bulls

Herman found that beef bulls were a part of bull studs in many artificial breeding associations.

About 6 per cent of the cattle artificially inseminated in the United States and as many as 20 per cent in Canada, are served with semen from registered beef bulls. Bull studs are providing beef semen as a result of the demand from farmers in their service area. Most of the studs do not find it as profitable to keep beef bulls as dairy bulls since the volume of cows serviced per sire is lower than for dairy sires. But most bull studs feel that since they are in business to provide artificial insemination service, they cannot ignore those requests.

All of the strictly beef breed registry associations in the United States bar from registration calves resulting from artificial insemination unless the owner of the sire and the dam is the same.

Frozen Semen

Drake, upon his return from England in 1952, after having seen the work done in developing frozen semen, predicted far reaching affects on artificial insemination in this country.

Carron reported the progress made with frozen semen thus:

Since his death in November, 1953, Pabst Burke Tritonia Don has sired several hundred healthy, normal calves.

At one hundred ten degrees below zero,

the frozen semen is stored indefinitely. During the freezing and the first week of storage, there is a drop of ten per cent of live sperm in the ampule; after that, the frozen semen seems to stabilize and there is no further kill of sperm.

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29 Max Drake, "Report of Trip to International Congress of Physiology and Pathology of Animal Reproduction and Artificial Breeding," Proceedings, Fifth Annual Convention (Springfield: National Associa-
Herman recounted from a recent survey that over half of the associations in the United States were using some frozen semen. For the first ten months of 1955, over eighty thousand cows were inseminated with frozen semen. The Waterloo Association in Canada started using frozen semen exclusively in December, 1954.

Cairns indicated many problems, changes, and possibilities with the use of frozen semen: consolidating bull studs; interchange of semen, especially for those studs not having enough cows of a particular breed to justify keeping bulls; eliminating the criticism that breeders can have no choice in bulls used on his herd; wider use by purebred breeders; make available the service of outstanding sires on future generations of granddaughters; worldwide use; development of young sires; reduced shipping costs; method of sire selection; misleading proofs of sires and their dangers; exploitation of sires by unscrupulous methods; effects on sales of bulls; registration problems for the breed associations.

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Competition

Drake pointed out that competition between cooperative artificial insemination associations in the same territory and between cooperatives and private organizations would not help the dairy farmer. He doubted that two organizations could stay in business in the same area, believing that after a time, one or the other would go out of business. The farmer would be left to pay the bill in the long run.

The National Association of Artificial Breeders adopted a code of ethics to combat misleading statements by their members. Two sections of that code follow:

7. No good purpose is accomplished by extravagant claims of the merits of sires or the efficiency of organizations. All members will use only truthful statements concerning their own association and other associations.

8. It shall be unethical for any member of this organization to attempt to interfere with techniques and practices developed by another organization, whether such interference be unfounded criticism, interference with or the proselyting of technicians employed by another organization, or in any other manner unfairly disrupting another organization.

Education

Herman emphasized the need of education as related to artificial insemination thus:

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Enumerating the problems to be solved in successfully organizing any cooperative breeding association, listed a broad educational program to precede organization and the beginning of the operation of the association, being careful to explain the advantages and disadvantages of artificial insemination; that they cannot expect much better results than from natural service; that cows vary in their breeding efficiency; that all cows will not settle with first insemination.

Frye names the lack of farmer education or an appreciation of such matters as physiology of reproduction as a problem in the operation of artificial breeding associations. 36

Folkman 37 in a summary of a study of membership relations in cooperatives in Arkansas stated that:

The findings indicated that a core of highly involved members were generally well-informed and of favorable opinion regarding these areas of cooperative concern. Most farmers, however, including many members, were woefully unaware of, and indifferent to, these same areas.

Sanders 38 in planning teaching procedure for Vocational Agriculture teachers related that:

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35 Herman, Op. Cit.
Since 1923, teachers of Agriculture in Virginia have used the farm job analysis as the basic teaching unit in organizing their programs of instruction in vocational agriculture. Enterprise analysis and analyses of certain areas of teacher activity have been made to determine the most needed jobs.

XV. Dairying (....)

8. Improving the dairy herd and registering animals:
   a. Selecting cows for culling;
   b. Selecting cows for herd improvement through breeding;
   c. Setting a breeding schedule and keeping records;
   d. Determining relative value of grades and purebreds;
   e. Providing service of a herd sire;
   f. Registering purebred animals;
      1. Securing necessary registration papers.
      2. Preparing and submitting the forms.

9. Determining whether to use artificial insemination:
   a. Efficiency of sires;
   b. Cost;
   c. Size of bull and cow;
   d. Disease;
   e. Possibility of increasing profits;
   f. Sterility;
   g. Rate of conception;
   h. Size of herd;
   i. Time required;
   j. Records.
CHAPTER III
HISTORICAL BACKGROUND

The historical background of the West Tennessee Artificial Breeding Association was largely the history of Jersey Cattle in the Yorkville Community. The village had a population of less than two hundred people who were small land owners and renters of family sized farms. The interest in good Jersey cattle began in the late nineties. S. B. Logan and Dr. E. A. Turner bought some registered Jerseys and brought them to Yorkville. About 1902 Bob Overall bought some registered Jerseys. At about the same time Dr. Happe II and H. H. Wade had purebred cattle at Trenton.

Dr. F. E. Wyatt started a registered herd of Jerseys in the early part of 1900. In 1918, he bought a bull, Gamboge’s Jollt Noble. This bull was a grandson of Gamboge’s knight, one of the famous bulls of the Jersey breed. He was used in the community until 1922.

The Jersey breeders began to buy bulls cooperatively in 1922. Among the leaders in this group were: O. B. Pope, J. S. McCutchen, S. B. Logan, F. A. Vaughan, and W. F. Jones. A Raleigh bred bull from Duerton Farms, Nashville, was bought. Dr. R. E. Fort of Nashville sold them Gamboge’s Raleigh Tut in 1924. Warder’s Jolly

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Castor was bought from Will Ezell of Nashville in 1927. In 1928, Oakwood Royal Fox was bought from Newton, North Carolina. All of these bulls, with the exception of one, did an outstanding job in the community. Gradually, other people throughout the community were beginning to buy registered Jerseys. Interest began to increase more rapidly about 1920. Careful consideration was given to the type of bulls used. A beautiful Jersey cow or heifer had a special place in the hearts of the people. The men would discuss and visit a new calf just as the women would visit a new baby.

Haltom organized a bull association in the county in 1926 with ten or twelve Jersey bulls serving in various communities. However, none of these bulls were used in the Yorkville community. They wanted to pick their own bulls.

In 1926, O. B. Pope did the first official testing in the community when he put some cows on Register of Merit test with the American Jersey Cattle Club.

The story of the beginning of the Yorkville Jersey Show has been told so many times that it has become a legend. O. B. Pope, M. O. Zarecor, F. B. Vaughan, and W. F. Jones were sitting around in I. C. Pipkin's general store after supper one night, as was the custom, and got into an argument as to who had the best Jerseys. Finally, to settle the argument, they decided to have a Jersey

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2L. H. Haltom, County Agricultural Agent, Gibson County.
show and invite anyone interested to enter cattle in the show. In spite of legendary value, the story is not quite true. Dyer, Tennessee, a neighboring town, had had a community fair for a few years prior to 1929. The Yorkville Jersey breeders had exhibited at the fair and had done well. Dyer decided to limit the show to their own community. As a result, the Yorkville breeders decided to stage their own show with the policy of making it open to the world if anyone wanted to enter cattle. From 1929, events in the community were dated as having happened either before or after the Jersey Show.

The first Show in 1929 had one hundred five head of cattle. Bulls were included. Some of the cattle were good and some were very much off-type. There began the education of a community in the value of type, proper feeding, and management. Before the show, everyone knew that they had about the best cattle in the community. Through the years, the spirit of the people had been the one thing which has distinguished this Show from similar shows. A spirit of community pride, which has been of inestimable value, had been developed even in people who had no interest directly in Jersey cattle. They became proud to tell people that they were from Yorkville. M. O. Zarecor was the first president of the Show.

About the same number of cattle were exhibited in 1930, 1931, 1932, and 1933. The catalogue stated that three hundred dollars was offered in premiums. Premiums were offered on seven classes of registered females, three classes of registered bulls, and four
classes of grade females. The first prize in each class was three dollars; second, two dollars; third place was a hundred pound sack of fertilizer; and fourth place was a twenty-four pound sack of flour. A beauty contest was staged for the high school girls of the area in the judging arena. The 1931 catalogue boasted that the Eighth District (Gibson County) had some of the finest Jerseys to be found anywhere and invited the people to come and see what thirty years of breeding can produce. One method of obtaining funds was to put political candidates on the spot, because it was bad politics not to help the Show, especially if his opponent had given a donation. These years were depression years. The matter of raising enough money to have a show was a serious problem. O. B. Pope was president of the Show for 1930, 1931, and 1932. The 1932 catalogue explained that the Yorkville Show was one of the few shows, large or small, to pay premiums in full the previous year.

No bulls were brought into the community during the depression years. Some farmers failed to keep their cattle registered. This later proved to be a mistake. Cream, the only dairy product sold, brought as low as five cents per pound. Good registered dairy cows sold as low as twenty-five and thirty dollars per head.

The 1933 Show had 105 entries. A junior show for Future Farmers and 4-H members had been a part of the Show each year with three classes and the same premiums as the main show. This year the Memphis Press-Scimitar covered the Show with a photographer.

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3Hilmon Pinegar, Photographer, Memphis Press-Scimitar.
and reporter. They spread the story over the front section of the paper. That publicity and all of the subsequent publicity in the Memphis papers and in other newspapers and magazines, gave the Show a rather unique place among shows, large or small. Local people were the winners in the early shows. W. F. Jones and Sons were the large winners. Scott Parrish was president of the 1933 Show.

The 1934 Show raised the premiums to five dollars, first place, with a total of sixteen dollars per class. The winners of seventh and eighth places received a twenty-four pound sack of flour. The catalogue lists no Junior show that year. The Show had begun the same size showing at other places. One enthusiast put it this way:

I'm cattle-minded. Perhaps back in my subconscious mind I've always been that way - and those folks up at Yorkville, Tennessee, have merely brought it out into consciousness. However, that may be, they've about convinced me that any gink who doesn't love good Jersey cattle should be avoided. If given a chance, he'll kidnap your baby or poison your well. Yessir! You'll never know real happiness till you get to monkeying around with cows - or till you get a bull by the nose ring and go around and around. It brings out the character in a man.

Three thousand people attended the 1935 Show. One hundred and thirty two head of cattle were exhibited. One more class of registered cows was added. A Queen's Ball, in honor of the Queen

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1George Carmack, Star Reporter, Memphis Press-Scimitar.
2Eldon Roark, feature writer, Memphis Press Scimitar, 1934.
of the Show was held in the High School Gymnasium. Some people of the community thought that this dance was an awful thing and refused to attend. The agricultural teacher was the only teacher present. This feature of the Show had now developed until almost everyone attends. The visiting Jersey breeders got a real thrill out of selecting the queen. Twenty-one girls from twenty-one high schools entered in 1955.

The 1937 catalogue stated that the Show had continued through every year of the depression and that the future looked bright. The State Department of Agriculture had begun to support the Show. It stated that a recent survey of the dairy cattle in the community found 1,228 head, and of this number 323 were registered.

In 1936 and 1937, the winners in the Show were no longer only local people. The winners had come from the northern section of West Tennessee. The people came from several states.

Perhaps the greatest boost the Show ever had was in 1938. The ninth annual Tennessee Production Show was held in connection with the Yorkville Show. It required a large effort to secure the show. Yorkville was seven miles from a railroad, and had no building facilities to offer. The Gibson County Court gave six hundred dollars to help finance tents to meet other expenses. The State Department of Agriculture had a special fund for support of this Show. A large catalogue with regular and new advertisers helped finance it. This Yorkville Show had one hundred and ninety-four entries. The premium list was raised to three hundred and fifty
dollars. The following selection from the catalog indicates the influence of this show on the life of the community:

The primary object of this Show is the improvement of dairy herds in this and the surrounding territory. The Show has continued to grow in interest and the quality of cattle exhibited has improved. Not only has this annual event attracted the attention of Jersey breeders from a distance, but also has become a homecoming for the community. To win in the Yorkville Jersey Show has come to mean more to the exhibitors than just the mere prizes awarded. The spirit of friendly rivalry which prevails among the breeders has stimulated an interest and a purpose toward improving the herds.

By 1940, the total premium had reached three hundred and sixty dollars. The bank of Yorkville had bought for Community service, two bulls; one from Motherwood Farms at Kingsport, and one from Toward Farms, Lexington, Kentucky. The Bank had financed fifteen heifers for the Future Farmers. W. F. Jones and Sons had a new bull from Ridgeway Farms, Athens, Tennessee.

The fourth bull class was added in 1941, also a "get of sire" class. In 1943, four hundred and fourteen dollars were offered as premiums, with first placing at six dollars then dropping to one dollar for sixth, seventh and eighth places. Merchandise premiums had now been dropped after many years. Dairy products were in demand as never before. Seven hundred dollars was given in premiums in 1944. That year one class was added to the grades and the junior heifer class was dropped. Produce of

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Foreward, 1939, Yorkville Jersey Show Catalogue.
Dam Class was added. The West Tennessee Junior Show was held in connection with the main show, having six classes of registered animals and two of grades. The main show premiums ranged from seven dollars to two dollars each for sixth and tenth place.

In 1945 $1300 cash premiums were given. The classes remained the same. The District Junior Show was held in connection with the main show. First premium was still seven dollars, but fifth to eighth was three dollars and ninth to fifteenth was two dollars. The big event of this year was the visiting of the new bull barn and bulls of the Yorkville Artificial Breeding Association. The Catalogue, for the first time, was dedicated to a person who had been associated with the Show. The first man thus honored was Wilson Jones, killed on Iwo Jima, the son of Mr. and Mrs. W. F. Jones.

Three hundred head of cattle were exhibited in 1946. The number exhibited has been above three hundred since that time. Bulls were dropped from the show, since the artificial insemination program had replaced most of them.

Classes for heifers resulting from artificial insemination were now added to the Show. By 1951, the premium list was fifteen hundred dollars. Two show rings had been necessary to complete the judging in one day. Two judges were working at the same time. A system of entering cattle before the Show date and bookkeeping had been established. All premiums were paid the day of the Show.
In 1951, a dairy herd class and a class for cows over ten years old were added. The grade junior classes kept the same premiums. The grade cows premiums had been raised to nine dollars for first place. The registered junior classes started with ten dollars for first place. The registered cows started with twelve dollars for first place. The classes called for fifteen placings winning money. The premium list compared very favorably with the large shows, since no entry fees were ever charged, and the cattle were kept for one day only. It was found that the 1955 premiums ran with the 1951 premiums. The only class added was a class for beginning junior showmen. The special classes for artificially bred heifers and cows were dropped after the 1950 Show.

The quality of cattle in the 1955 Show was a "far cry" from those in the 1929 Show. Some classes had as many as thirty-five entries. Animals had to be good to even place in the money. The winners of the Yorkville Show have later stood well in some of the largest shows in the country.

The Show has been held on the same location for twenty-seven years, a beautiful wooded lot just south of the village, the slopes forming a natural amphitheatre for the show ring with oak trees furnishing shade for the Jerseys and the people. Friday, of the week of August twentieth, has always been the date for the Show. A number of advertisers have supported the Show during its entire history. It has had the loyal support of all of the neighboring towns. Year after year, they have been solicited for
funds and they have always contributed liberally.

The Show has been open to everyone desiring to enter Jerseys since its beginning. The Community has never criticized a judge either during or after the Show. In a few instances when unpleasantness occurred, it was caused by someone from without the Community. Outside attractions, such as carnivals, were never allowed on the grounds. The Parent Teachers Association served wonderful lunches and they, with the High School organizations, provided refreshment stands. A sound truck has broadcasted the decisions and reasons given by the judge. The Jersey cow was the center of attraction at each Show.

Over the years, the Show has had some of the most outstanding Jersey judges in the United States. Among them were Dr. W. W. Yapp, Head, Dairy Department, University of Illinois and Dr. George Taylor, United States Rubber Company, classification judge of the American Jersey Cattle Club. The growth and development of the Jersey and dairy interest in the Yorkville Community has covered a period of about sixty years. The advancement was gradual over most of the period. In the past eleven years, the expansion was accelerated.
Agencies Involved

The agencies involved in the organization of the West Tennessee Artificial Breeding Association were many, as it gradually evolved over a period of years. Some were directly connected, others were indirectly concerned. Had it not been for the early interest developed in Jersey cattle in the community, the Yorkville Jersey Show, and the Yorkville Cooperative Breeding Association, the West Tennessee Artificial Breeding Association would very likely not have been organized at Yorkville.

The Illinois Central Railroad's agricultural agents under the leadership of Farlow had long taken an active interest in the Yorkville Jersey Show, Luttrell judging the first Show. Jones was directly responsible for the effort which established the Yorkville Cooperative Breeding Association. The Illinois Central Railroad had loaned a number of bulls to the stud. In 1955, the railroad had eight bulls on loan in the stud.

The Tennessee Agricultural Extension Service through the efforts of Haltom had established a county Bull Association and

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1P. W. Farlow, General Agricultural Agent, Illinois Central Railroad, Chicago.

2Luttrell, Agricultural Agent, Illinois Central Railroad, Mississippi.
had stimulated interest in Jerseys in the county. Wingo\(^5\) cooperated
in every way possible, conducting meetings, signing up cow owners,
and securing help. Hutton\(^6\) visited the community and gave his
advice. Colebank\(^7\) was active in promoting the Jersey Show, as
Extension Dairyman for Tennessee at the time the West Tennessee
Artificial Breeding Association was organized, gave valuable assis-
tance. Chappell\(^8\) gave help in organizing the central stud and
valuable aid in its operation. County Agricultural Agents in other
counties helped too.

The Tennessee Department of Agriculture supported the York-
ville Jersey Show through its funds for fairs. Again, Jones\(^9\) was
directly responsible for the organizing of the West Tennessee Arti-
ficial Breeding Association. As State Commissioner of Agriculture
in 1949, he secured an appropriation for the building and plant,
for equipment and for adding needed bulls.

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\(^3\)Edward Jones, Agricultural Agent, Illinois Central Rail-
road, Yorkville.

\(^4\)L. H. Halton, Former County Agricultural Agent, Gibson
County.

\(^5\)Tom Wingo, County Agricultural agent, Gibson County.

\(^6\)C. A. Hutton, Tennessee Extension Dairyman, Knoxville.

\(^7\)L. O. Colebank, Agricultural Extension Service, Knoxville.

\(^8\)Clyde Chappell, District Extension Dairyman, Jackson.

\(^9\)Edward Jones, State Commissioner of Agriculture, Nashville,
1949-1952.
The Vocational Agriculture Department in the local high school through Revelle had an active part in the organization. Evening classes had been taught in dairying. All-day boys had received instruction in dairying. He was president of the Yorkville Jersey Show for thirteen years, president of the Yorkville Cooperative Breeding Association, and the first president of the West Tennessee Artificial Breeding Association. The Crockett County Artificial Breeding Association was organized through his efforts. Kuykendall became president of the Yorkville Jersey Show in 1945. He has been president through 1955. He has worked to promote the organization in every way possible. Agricultural teachers in the area served, have helped organize and promote the Association.

Pet Milk Company through its Trenton plant published and distributed two bulletin books. These books gave information on pedigrees, classification, and advice to farmers on how to cooperate with the Association in order to get the best service. Thompson and his associates were active in securing membership.

The Bank of Yorkville had promoted Jerseys through its loan department for cows, barns, and equipment. It had furnished several bulls for natural service before the artificial program was started.

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12. Newell Thompson, Manager, Pet Milk Company, Trenton.
Forrester\textsuperscript{13} was Secretary-Treasurer of the Yorkville Show, Yorkville Cooperative Breeding Association, and the West Tennessee Artificial Breeding Association. The Bank, under his leadership, had a progressive program to promote Jerseys and dairying. The banks of the counties served, bought Hereford bulls for the stud in 1952.

The numerous advertisers with the Yorkville Jersey Show had a part in the organization as their continued support over the years had kept the Show operating.

The Yorkville Jersey Cattle Club did yeoman service in all of the Jersey activities of the community over the years including the organization of the West Tennessee central bull stud. Among these members were O. B. Pope, F. B. Vaughan, W. F. Jones, Edward Jones, Lester Knig, Fred Hatler, M. I. Revelle, Lloyd Kuykendall, Bob Ramsey, Jack Zarecor, Allen Zarecor, Bob Zarecor, Hamilton Logan, M. R. Forrester, and Bob Logan. The list included many more men.

In the spring of 1961, Farlow\textsuperscript{14} in conference with the Agricultural Agents of the Illinois Central Railroad, discussed the artificial insemination of dairy cows in various places in

\begin{flushright}
\textsuperscript{13}M. R. Forrester, Cashier, Bank of Yorkville.
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\textsuperscript{14}P. R. Farlow, General Agricultural Teacher, Yorkville High School.
\end{flushright}
the United States. He told the Agents that he was ready to ask the Vice-presidents of the Illinois Central for $3,000 to purchase three bulls to put into service in an artificial insemination bull stud somewhere along the Illinois Central lines. The first Agent making satisfactory arrangements as to cows to be bred, buildings and equipment, and technician, would get the bulls on a lease agreement with the Railroad.

Edward Jones\(^1\) came home and asked the President of the Yorkville Jersey Cattle Club, M. I. Revelle\(^2\), to call a meeting of the Club, to discuss the possibilities of Yorkville meeting the requirements of the Illinois Central Railroad for an artificial insemination stud. Those present were very enthusiastic. The first problem was to see how many cows could be signed up for the service. The president appointed a committee to do this job. The committee was composed of Burrow Spence, Lester King, F. B. Vaughan, W. F. Jones, C. B. Pope, M. R. Forrester, Edward Jones, and T. R. Wingo\(^3\).

The initial effort of this committee seemed to give assurance that 1,000 cows could be signed for service. Meetings were held in almost every community within the area decided upon as practical to furnish service. A contract drawn up by the Yorkville Jersey

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\(^1\)Edward Jones, Agricultural Agent, Illinois Central Railroad, Yorkville.

\(^2\)M. I. Revelle, Vocational Agriculture Teacher, Yorkville High School.

\(^3\)T. R. Wingo, Agricultural Agent, Gibson County.
Cattle Club provided for annual meetings and that a Board of Directors was to be elected at the first meeting. Each member signing a contract agreed to pay five dollars membership when his application was accepted and a breeding fee of five dollars per cow at the time of first service. This fee would entitle him to three services for this cow should she require it. For each additional service over three, the member agreed to pay three dollars per service. A mileage fee of five cents per mile for distance over twenty miles from Yorkville was to be paid by the member.

Edward Jones agreed to lease the Association three acres of land for pasture and building site for the barn. The five dollar membership fees were used to buy material for constructing the barn. The men of the community furnished most of the labor. The barn had stalls for five bulls, a breeding space and a laboratory for processing semen. Storage space for hay and grain was provided in the loft of the barn. Three pastures were fenced with discarded railroad ties donated by the Illinois Central Railroad and forty seven inch heavy gauge wire. A second hand refrigerator was installed for holding the semen.

Every step in planning, soliciting members and carrying out plans was new to the men working on it. At times things were very discouraging. In March of 1945, the building of the barn was under way and sufficient cows had been signed up for the service. A meeting was called of all of the membership to officially set up an organization. At this meeting directors were elected: for one
year, W. L. Fowler, O. B. Pope, and Burrow Spence; for two years, F. B. Vaughan and Edward Jones; for three years, M. I. Revelle and W. F. Jones. These directors then elected M. I. Revelle, President; W. L. Fowler, Vice-President, and M. R. Forrester, Secretary-Treasurer. They then interviewed and hired Fred J. Hatler of Dresden as technician. Hatler had had no previous experience in artificial insemination in any capacity. He had operated a dairy farm and loved Jersey cattle.

At this time the Illinois Central Railroad bought for the Association Golden Volunteer Signal, bred by the Shelby County Penal Farm, Memphis, from Wayne Rudolph, Bandana, Kentucky. This bull classified "Very Good". He was not a proved Sire.

Morocco's Raleigh Financier, owned by the Illinois Central Railroad, and on loan to Malcolm Harrison, Farmington, Kentucky, was brought to Yorkville for the stud. This bull classified "Excellent" and was a Superior Sire with thirty-seven daughters Avg. 7677 milk h33 fat and forty-four daughters Avg. 8h.32 per cent in classification.

Rosario Bodicia Design owned by the Bank of Yorkville was the third bull in the stud. He was bred by Forest Lake Farms, Tupelo, Mississippi. This bull had been used in natural service in the community. The service had been so heavy that his semen was soon found to have a very low fertility rate and he was soon discarded. He was replaced by Eras Noble Designer, who classified "Very Good". His sire, Princely Aim, classified "Good Plus" His
Dam, Ena Design Sally, classified "Excellent" and sold for $3,000. Despite this, she was never a good milker and the daughters of this bull proved to be a disappointment. After two years he was released from the stud.

On May 18, 1945, a Mr. West of Mason Hall, Tennessee, had the first cow bred by artificial insemination in the Yorkville Cooperative Breeding Association and the program was on its way. Technician Hatler cared for the bulls, processed the semen, inseminated cows, and worked to add new members.

From May 18, 1945 through December 31, 1945, 630 cows were inseminated with a conception rate of 56 per cent. For the year 1946, 1,034 cows were inseminated with a conception rate of 65 per cent as shown in Table II. Three bulls were added to the stud in 1946. One was Coronation Dotrina Astor, who was a young bull, that had been used at Yorkville. The other two, Design Royal Raleigh Lad bred by Hallmark Farms, Kansas City, Missouri, and Right Royal Raleigh Lad bred by Plainview Farm, Louisville, Kentucky, were bought for service at Yorkville by the Illinois Central Railroad. Both of these bulls had solid pedigrees back of them.

In 1947, business of the Yorkville Association continued to increase at a rapid rate. The second technician, R. S. Freeman was employed in the summer. Two local Associations were organized; one in Weakley County and one in Madison County. These Associations were set up similar to the Yorkville Association and bought their semen from the Stud at Yorkville. They employed their
### TABLE II

**TOTAL NUMBER OF COWS BRED BY YEARS 1945-1950**

**YORKVILLE COOPERATIVE BREEDING ASSOCIATION**

<table>
<thead>
<tr>
<th>Association</th>
<th>1945</th>
<th>1946</th>
<th>1947</th>
<th>1948</th>
<th>1949</th>
<th>1950</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yorkville</td>
<td>630</td>
<td>1,034</td>
<td>1,414</td>
<td>2,157</td>
<td>2,009</td>
<td>2,132</td>
</tr>
<tr>
<td>Weakely</td>
<td>0</td>
<td>0</td>
<td>612</td>
<td>908</td>
<td>658</td>
<td>890</td>
</tr>
<tr>
<td>Henry</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>723</td>
<td>677</td>
<td>867</td>
</tr>
<tr>
<td>Madison</td>
<td>0</td>
<td>0</td>
<td>432</td>
<td>644</td>
<td>574</td>
<td>661</td>
</tr>
<tr>
<td>Carroll</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>305</td>
<td>585</td>
<td>711</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>630</td>
<td>1,034</td>
<td>2,458</td>
<td>4,737</td>
<td>4,503</td>
<td>5,261</td>
</tr>
<tr>
<td>Conception rate (per cent)</td>
<td>58</td>
<td>65</td>
<td>66</td>
<td>50</td>
<td>66</td>
<td>72</td>
</tr>
</tbody>
</table>
technicians and had their Boards of Directors. They were given representation on the Yorkville Board according to the number of cows inseminated. For the first thousand or part of a thousand, they had one board member and one director for each thousand cows above the first thousand.

Spear's Golden Signal bred by the Shelby County Penal Farm, Memphis, was added to the stud at this time. He was a young bull with a solid pedigree for production classifying "Very Good", carrying the Volunteer and Bouncing Bet blood lines. He was bought by the Illinois Central Railroad.

In 1948, three more local associations were organized in Henry, Carroll, and Crockett Counties. They bought semen from the Yorkville Association and employed their own technicians. Semen was also shipped to an association in Graves County, Kentucky. A third technician, Harold Hatler, was employed. The number of cows inseminated during the year was 4,737 with a conception rate of fifty per cent.

In 1949, the Yorkville Cooperative Breeding Association purchased two Jersey bulls, Biltmore Draconis King Onyx, Biltmore Farms, North Carolina and Favorite Standard Signal Lad bred by Shelby County Penal Farm, Memphis. Both bulls were young and unproven. The semen shipment to Graves County, Kentucky was discontinued when Kentucky Stud was organized. Pet Milk Company published the "Bull Book" containing pedigrees of the bulls in service at that time and distributed copies throughout the area.
The number of cows bred in 1949 was 4,503 with a conception rate of 66 per cent.

**West Tennessee Artificial Breeding Association**

An event of significance happened after the state elections in 1948. Governor Gordon Browning appointed Edward Jones, then agricultural agent of the Illinois Central Railroad, to his cabinet as Commissioner of Agriculture. Jones included in his request for funds, money for aiding the artificial insemination program in the state. The amount of funds requested was $50,000 biennially. The funds could be used in any manner which the Commissioner saw fit for the program. The program was approved by the legislature and the Governor.

**Plant**

After careful consideration as to location, cost and desirability for its intended use, a twenty-six acre farm, located just out of Yorkville on Highway 77, was purchased. The farm was bought in early 1950. Considerable grading was done on the grounds. The barn site was almost in the center of the farm with a long slope to the highway. Much thought and planning went into plans for the barn. The barn had stalls to accommodate sixteen bulls with each bull having an outside pasture of considerable size. The pasture plots extended from the barn in a fan shape. Each stall had a door connecting it with the pasture. This door could be operated from the front of the stall. Safety features were installed to prevent anyone being hurt in handling the bulls. An iron rail was ex-
tended the length of hallway almost shoulder high in order that the attendant could stay on one side of the rail and keep the bull on the other side. Feed storage, with feeding chutes to mangers, were located in the loft of the barn. A runway from barn to laboratory furnished garages for technicians' automobiles. The offices of the Association were located in the front of the laboratory. The Board of Directors meeting room was placed over the offices and laboratory. The laboratory was equipped with modern refrigeration, and facilities for processing, storing, shipping, and examining semen. Office equipment for all types of records needed was installed. The construction work was completed in the fall of 1950.

Preliminary Organization

The presidents of each local association made up the Board of the West Tennessee Artificial Breeding Association until its first regular meeting was called. The Yorkville Artificial Breeding Association became a local association along with the other member local associations in Weakley, Carroll, Crockett, Henry, and Madison Counties. Fred Hatler was employed as manager of the West Tennessee Stud. R. S. Freeman and Harold Hatler were employed by the Yorkville Association. They were to assist Fred Hatler with the work of the West Tennessee Artificial Breeding Association and Fred was to continue inseminating cows for the Yorkville Association as time permitted.

Five bulls were added to the stud in 1950. Dreamer's Jester Standard bred by Edison B. Butch, North River, Prince Edward
Island, Canada, was bought by the Illinois Central Railroad. This bull classified "Excellent" and had a solid pedigree of production. The other four were leased from the New York Artificial Breeders Association. They had been used on a limited basis in New York state and were loaned to the West Tennessee Stud until the production of their daughters in New York could be proved. The only cost to the West Tennessee Artificial Breeding Association was the transportation costs from and back to the New York Stud. The number of cows for the year 1950 was 5,261 with a conception rate of 72 per cent.

The West Tennessee Artificial Breeders Association16 was organized under the state laws governing Cooperatives. Each member of a local association affiliated with it was also a member of the central organization and was entitled to one vote in the affairs of the Central organization. All services were to be rendered by the association at cost. From fees and deposits received, were to be deducted the costs and expenses of operation including salaries, maintenance and care of bulls, and any other necessary livestock, power, water, transportation, taxes, insurance interest, depreciation and all other expenses. The balance was to be placed in a reserve fund for contingencies and capital purposes. Contingent reserves were to be entered on the books of the Association.

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16 By-Laws, West Tennessee Artificial Breeders Association, Yorkville, Tennessee, adopted first annual meeting 1951.
to the credit of the members in proportion to the amount of business done with the association. However, one provision of the By-Laws differed from a cooperative. If the Association should go out of business at some future date, any balance remaining after paying the secured and unsecured debts of the Association would be transferred by order of the Board of Directors to some other corporation created under the laws of Tennessee for the benefit and improvement of dairying in Tennessee.

The plan of operation for the West Tennessee Artificial Breeding Association was for it to be operated as a central association with affiliated local associations, or units, in the areas to be determined by the Board of Directors. The central association was to manage and operate a central bull barn and laboratory from which semen would be shipped to the affiliated local units.

Local Associations

A local association could become affiliated with this association only by action of the Board of Directors of this Association and when it had met the following requirements:
1. Submitted application for memberships from owners of dairy cows, who have enrolled for service not less than 300 cows. These cows could be both registered and grade. The minimum number of cows required for the service of any particular breed was to be determined by the Board of directors of the central association.
2. Remitted the portion of membership fees and financing fees required in the by-laws of West Tennessee Artificial Breeding Asso-
3. Its certificate of incorporation approved by Board of Directors.
4. Signed an agreement of affiliation with this association.
5. Employed an approved inseminator.

Fees collected and how divided: Each member paid a membership fee of five dollars to the treasurer of his local association, which was for a lifetime, unless canceled. This fee was not transferrable. (See a copy of membership contract in appendix.) A financing fee of one dollar per cow enrolled was paid for the life of the animal. This fee was not transferrable. The treasurer of each local association was to remit to the treasurer of the central association three dollars of each membership fee and one dollar of each financing fee. The balance of these fees was retained by local associations to purchase equipment and meet other expenses.

Fees

The breeding fee was to be set and collected by each local association. The local agreed to pay the central association one dollar and fifty cents for the semen for each first service. There were no more charges for semen for extra inseminations should that be necessary. However, if the cow should go ninety days or more between services, the charge for semen would be refunded. In each case the central pays the postage to the local while the local pays for returning the carton. No member was liable for the debts of the central association, other than unpaid debts which he had contracted with the association. The central association was not
liable to any local association or member for any loss or damage resulting from membership in central association. The fee to be paid to the central association for semen was to be set by the Board of Directors before October 10 of each year and immediately this information was to be mailed to local associations. The breeding fees due the central association from the locals were to be sent to the treasurer of the central by the tenth of the following month together with records required by the central association.

The fiscal year of the central association began January first and ended on the last day of the following December. The annual meeting date was the first Wednesday in March. (See appendix for a notice of an annual meeting.) Special meetings could be called by the board of directors or upon the written request of fifty members, stating time, place, and purpose. The by-laws required that notice of annual meetings be mailed at least five days before the meeting. They also provided for each member to have one vote either in person or by proxy. Twenty-five members present at an annual meeting constituted a quorum.

Board of Directors

The membership of the first or original board included the following: Edward Jones, D. D. Graves, M. I. Revelle, Tom Lee, and L. B. Snider who served until the first annual meeting of the association. The membership of the Board of Directors was to be increased from the date of the organization meeting by the election
of directors by and from each affiliated local association which had been operating one year or longer. The ratio set was one director for each 1,000 or less cows inseminated during the preceding fiscal year and one additional director for each additional 1,000 cows. For a local association organized during the current year, provision was made for it to have one director in the central association immediately upon organization and after that to follow the procedure set up in the by-laws of the central association.

The Board of Directors were required to meet within ten days after the annual meeting and elect officers. The officers elected by the Board were president, vice-president, secretary, treasurer or secretary-treasurer. Vacancies on the board were to be filled by election of successor by local associations. The Board was required to meet quarterly or when special meetings were called by the president or by a majority of directors. Board members were to be notified of meetings at least one day ahead. (A sample copy of such a notice is shown in the appendix.) The business of the central association was placed in the hands of the Board of Directors. The Board of Directors had supervision and control of the business; made all rules and regulations not conflicting with the by-laws; install an accounting system adequate to meet all the requirements of the business; employ a manager, or a manager-inseminator; and require adequate bond with a responsible bonding company of all persons handling funds for the association. They were to purchase insurance to cover all property of the association and
liability for accidents of all employees and the public. Audits were
to be made at least once each year by a disinterested public account-
tant. This audit was to produce a balance sheet showing the true
assets and liabilities of the association; an operating statement
for the fiscal period under review showing all receipts and expendi-
tures; records of all collections and shipments of semen; records
of memberships and reports of insemination and deposits for semen
received from local associations. The board was to select the
bank or banks to act as depositories of association funds; to deter-
mine the manner of receiving, depositing and disbursing of funds
and the person or persons signing checks.

**Bull Selection**

The by-laws provided that the association would maintain a
sufficient number of bulls of superior quality, and a central barn
and laboratory with adequate facilities for collection of viable
and high quality semen and would process and ship semen to the
affiliated associations at such times and such quantities as to
meet their needs. The bulls in the stud were to be selected, fed
and cared for in accordance with modern approved methods. The
regulations governing the selection of bulls were clearly defined
in the by-laws. The purchase and lease of bulls was by action
of the Board of Directors. A committee composed of three or more
members of the association was to be selected by the board to
evaluate bulls for type and production and purchase them with the
help of a representative of the University of Tennessee. Every
reasonable effort was to be made to buy proved bulls, with daughter-dam comparisons. When it was not possible to buy proved bulls, sons of proved bulls out of dams that were daughters of proved sires, with as many production records as possible in their records were to be selected. Pedigrees and production records were to be carefully analyzed and evaluated, taking into consideration the level of production and the care and feed conditions under which records were made. Before purchased, bulls were to be free of Brucellosis vaginitis and trichomoniasis as determined by a competent veterinarian. A thorough check was also to be made of the general health of herds from which bulls came and for any breeding irregularities.

Operation Since Organization

In March of 1951, the manager of the central stud, reported to the Board of Directors that there was a demand for Hereford bulls in the bull stud by farmers, who wanted to raise veal calves from dairy cows, and also from some grade beef cattle men. (See appendix for call of meeting.) He stated that associations in other parts of the country were adding beef bulls and proposed to ask the banks in the area served by the association to buy the beef bulls. The directors decided to follow his advice. As a result, three Jackson banks, Commerce Bank of Huntingdon, Dyer, and Crockett County Banks, and Obion County Bankers Association each bought a bull. In September of 1951 Fred Hatler, manager of the association, was replaced by R. S. Freeman.

Hatler had done an excellent job and the artificial program
in West Tennessee had made rapid strides since he began work in May 1945. Freeman managed the West Tennessee stud and inseminated cows for the local Yorkville Association for the remainder of the year with Harold Hatler, technician for the Yorkville Association helping with the management of West Tennessee Association bull stud.

In 1951, 8,013 cows were bred with a conception rate of 67 per cent. Harold Hatler resigned as technician effective January first, 1952. The Yorkville association then hired three technicians, Harold Browder, Paul Crenshaw, and Howard Fields. Each had completed the short course in artificial insemination at the University of Tennessee. These technicians also helped with the work of the West Tennessee bull stud. About this time the Crockett County Association made an agreement with the Yorkville Association to take the Crockett County area into the Yorkville association.

When the lease expired on the Holstein bulls owned by the New York Breeders Association and these bulls were returned to New York, the Tennessee State Department of Agriculture purchased four Holstein bulls: Kenjo Regal Belmont, bred by Kenneth Rhein, Oakfield, Wisconsin; Major Comet, bred by Sam C. Stanchfield, Fond du Lac, Wisconsin; Floradale Alice AP Mike, bred by Newton B Flora, Boones Mill, Virginia; and Bowmont Prisetaker Janet Sir, bred by C. L. Bowman, Boones Mill, Virginia. These were young bulls which had solid pedigrees for both type and production.

During this year two more Jersey bulls were added, one by the Tennessee State Department of Agriculture: Highfield Design, bred
by Hall Mark Farm, Kansas City, Missouri and proved in the herd of Forest Sample, Rutherford, Tennessee; and Dandy Sir Royal Wonder, bred by Pebble Hill Plantation and owned by the Illinois Central Railroad. This bull classified "Excellent" and had a solid pedigree for type and production.

Shipment of Holstein semen to the South Mississippi Cooperative Breeding Association was then begun. The number of cows inseminated in 1952 was 9,800 with a conception rate of 68.16 percent.

In 1953 three Jersey bulls were added to the stud. Illinois Central Belmont Beacon, bred by Don Head Farms, Ontario Canada classified "Very Good" and carrying a solid pedigree of world famous Brampton breeding, and Illinois Central Brampton Beacon, bred by B. H. Bull and Son, Ontario, Canada, classified "Very Good" and also carrying a solid line of Brampton was purchased for the stud by the Illinois Central Railroad. The Tennessee State Department of Agriculture purchased Brampton B. F. Breed, bred by B. H. Bull and Son, Ontario, Canada. This bull classified "Very Good" and had the Brampton and Pinnacle breeding. His pedigree was solid for production.
CHAPTER V

PROBLEMS ENCOUNTERED

Selecting Bulls

The bulls with production records on daughters used in the stud when the Yorkville Association operated it and since the West Tennessee Association was formed are listed below:

Jerseys:

Golden Volunteer Signal; six daughters Avg. 7,995 pounds milk, 446 pounds fat.

Morocco's Raleigh Financier; 6 daughters Avg. 8,323 milk, 449 fat; 62 classified daughters Avg. 61.6.

Ena Noble Designer; 7 daughters Avg. 7,157 milk, 439 fat; 28 classified daughters Avg. 63.9.

Right Royal Raleigh Lad; 9 daughters Avg. 7,065 milk, 399 fat; 22 classified daughters Avg. 51.6.

Design Royal Raleigh; 16 daughters Avg. 7,933 milk, 430 fat; 34 classified daughters Avg. 63.7.

Highfield Design; 20 daughters Avg. 7,734 milk, 422 fat; 32 classified daughters Avg. 66.7.

Brampton B. P. Bread; 16 daughters Avg. 7,577 milk, 441 fat.

Holsteins:

Ray Lou Blend Duke; 12 daughters Avg. 11,758 milk, 414 fat, 12 dams Avg. 10,513 milk, 390 fat
Daughters over dams $945 milk, $240 fat.

Fair Barn Paul Teddy; 14 daughters, 12,640 milk, 461 fat.

Ormsby Posh Netherland; 37 daughters, 11,640 milk, 418 fat.

It was found impossible to obtain daughter-dam comparisons on the bulls that had served in the stud, with the exceptions of
those bulls that had made the records in natural service in private
herds before being brought into the stud at Yorkville.

Inadequate records were found on the bulls used. From studies
of comparisons of the production of daughters from natural service
and from the same bull in artificial service, there seemed to be
very little correlation between the two. Several central bull studs
had developed a plan for proving bulls in artificial service. The
plan called for a number of farmers who were testing, to breed
several cows to a certain bull. At least fifty daughters scattered
in various herds were wanted. The management, feeding, and pro-
duction level varied from herd to herd. After the bull had sired
these daughters, he was used very lightly or not at all until the
records were in on these daughters. If this cross section showed
that the bull could not get the production wanted in his daughters,
he was retired permanently. If the records were good, he would be
used heavily for the rest of his productive life. A poor bull
could do immeasurable harm in artificial insemination if heavily
used from the beginning and then retired when his daughters showed
poor production. This method has oftentimes proved very expensive
for the farmers.

The bulls used in the central stud at Yorkville were
selected for type and pedigree. A few proved bulls were bought.
Proved sires were scarce and the price high. The association
bought three proved bulls. Since it was not feasible to buy proved
sires, young bulls with solid pedigrees were purchased. Their
sires and dams and their grand sires and grand dams had production records adequate for proof. The genetic make up of an animal for production could not be pure, again the only reliable proof of production was production of daughters. No matter how carefully the selection was made, some bulls would not have the ability to pass their supposedly high production inheritance to their daughters.

Six to ten proved daughters were enough to prove a bull in the registered dairy associations. If these daughters were from high producing dams, the proof could be misleading. While production testing was not a part of the West Tennessee Cooperative Breeding Association program, satisfactory proof on bulls used could be obtained in no other manner. The only Dairy Herd Improvement Association operating in the territory was the Gibson D. H. I. A. It had twenty members with eighty cows on test. This number was a very small part (8.38 per cent) of the total cows inseminated in one year. Since testing was necessary for a dairyman to know where he was in breeding as well as financially, it would seem that more testing associations would have been needed. The central stud could get artificial insemination proved bulls more quickly.

If finances permitted, young bulls having solid production and type pedigrees could have been purchased, and by agreement with the members who did D. H. I. A. testing, used on five or more cows in each herd and then retired or used lightly, until these heifers came into production and completed one lactation.
If fifty daughters were tested, this would have given a true picture of the bull's transmitting power. This system would have involved more financing, as more money would have been invested in bulls with the added expenses of feeding and caring for them while waiting for their daughters to develop and go through one lactation. Perhaps the bulls could have been loaned out to some other section and saved the feeding and care bill. This was the reason for the bulls loaned to the West Tennessee Artificial Breeders Association from the New York stud. It appeared that the lack of artificial insemination proof on bulls used was a weak aspect of the association.

The Board of Directors evolved a plan for testing young bulls before they went into the stud. The bull was loaned to a member who was a good feeder and manager and doing testing on his herd. The farmer agreed to keep the bull until his daughters production proved the bull. Only one bull was found on this sort of test. This plan had serious defects, even if carried out with every young bull purchased. The bull would be used in natural service on one farm with a better than average dairymen handling his daughters. The plan outlined above for proving young bulls in a number of herds varying in management would give far more accurate proof of their ability in an artificial breeding stud.

Reasons for Bulls Leaving Stud

Eighteen bulls were removed from the Yorkville Association and the West Tennessee bull stud since operations began in 1945 as shown in Figure 1. Leases expiring accounted for 28 per cent; low
<table>
<thead>
<tr>
<th>Bull's Name</th>
<th>Date Left Stud</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>Golden Volunteer Signal</td>
<td>1956</td>
<td>Rheumatism</td>
</tr>
<tr>
<td>Morocco Financier</td>
<td>1950</td>
<td>Died</td>
</tr>
<tr>
<td>Ena Noble Designer</td>
<td>1951</td>
<td>Arthritis</td>
</tr>
<tr>
<td>Carnation Dattrina Aster</td>
<td>1948</td>
<td>Low Quality Semen</td>
</tr>
<tr>
<td>Right Royal Raleigh Lad</td>
<td>1953</td>
<td>Transferred</td>
</tr>
<tr>
<td>Design Royal Raleigh</td>
<td>1949</td>
<td>Low Quality Semen</td>
</tr>
<tr>
<td>Spiers Golden Signal</td>
<td>1954</td>
<td>Old Age</td>
</tr>
<tr>
<td>Biltmore Dracors King Onyx</td>
<td>1955</td>
<td>Low Quality Semen</td>
</tr>
<tr>
<td>Favorite Standard Signal Lad</td>
<td>1953</td>
<td>Injured Leg</td>
</tr>
<tr>
<td>High Field Disigh</td>
<td>1954</td>
<td>Died</td>
</tr>
<tr>
<td>Dandy Sir Royal Wonder</td>
<td>1955</td>
<td>Old Age</td>
</tr>
<tr>
<td>Brampton B. F. Bread</td>
<td>1956</td>
<td>Low Quality Semen</td>
</tr>
<tr>
<td>B. D. S. Angelon Carl</td>
<td>1952</td>
<td>Lease Expired</td>
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<td>Fairbarn Paul Teddy</td>
<td>1952</td>
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<tr>
<td>Armsby Pasch Neterland</td>
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<td>Ray Lou Blend Duke</td>
<td>1952</td>
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<td>Rhamont Prize Taker Janet Sir</td>
<td>1956</td>
<td>Lease Expired</td>
</tr>
<tr>
<td>Major Comet</td>
<td>1955</td>
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</table>

Figure 1. Reasons for removing bulls from the Yorkville and West Tennessee Studs.
quality semen, 22 per cent; disease and injury, 17 per cent; old age, 11 per cent; died, 17 per cent; released to another stud, 6 per cent. Low production of daughters was not given once as a reason for removing a bull. From reports of other studs, it would be almost miraculous if all bulls in a stud should prove to have the ability to sire daughters with satisfactory production.

**Keeping Membership Informed**

The annual meetings of the West Tennessee Artificial Breeders Association were well attended and the interest was good. The programs were designed to acquaint the membership with the operations for the past year and present plans for the coming year. The Secretary and the Treasurer made full reports. Men, well informed on dairy problems and artificial insemination, were secured as speakers for these meetings. It was found that a well informed member was a cooperative member and mimeographed letters were sent to all of the membership at various times as matters presented themselves that needed to be called to the attention of members. (See copy of letters sent to members in appendix.) Local papers of the area served by carrying news articles from time to time about the association, especially when new bulls were added to the stud. A few paid advertisements were run in local papers. The newspaper publicity which was given to the Yorkville Jersey Show also gave publicity to the bull stud. It was found that a well informed technician with a correct attitude was the most effective means of informing members and keeping them satisfied as to the affairs of
the association. Efficient service and high conception rates were
the best publicity measures of the association. It was found that
one dissatisfied member would do more harm with adverse criticism
than several well satisfied members would do good with praise.
Three bull books containing pictures of the bulls in the stud, their
pedigrees, classification, and with information advising the mem-
bership how they could cooperate to secure the best service, were
distributed to the membership at various times. The last bull
book was distributed in 1954. As new bulls were added, their
pedigrees and classifications were distributed to the membership.
(See appendix for kind of information on bulls sent to members.)

Conception Rate

The lowest conception rate of the Yorkville Cooperative
Breeding Association was found to be 50 per cent in 1948, as shown
in Table III. The highest rate of the West Tennessee Artificial
Breeding Association was 72 per cent in 1952. The other years
ranged between these rates. The failure of cows to conceive pre-
vented a serious problem to the association as it caused extra
costs and the membership lost money from the failure of cows to
calve at the proper time. The association made careful studies
of the semen processed each day for morphology, motility, and
concentration of spermatozoa. If a bull's semen failed to meet
standards over a period, he was removed from service. All bulls
were checked by a veterinarian for any venereal infections and
abnormalities. If a cow failed to conceive in three services with
### Table III

First services, conception rates and increase or decrease in cow numbers inseminated by years, Yorkville Association 1945-1950, West Tennessee Artificial Breeders Association 1951-55.¹

<table>
<thead>
<tr>
<th>Year</th>
<th>First Service</th>
<th>Conception Rate</th>
<th>Cow Increase or Decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>1945</td>
<td>630</td>
<td>58</td>
<td>-</td>
</tr>
<tr>
<td>1946</td>
<td>1,034</td>
<td>65</td>
<td>† 404</td>
</tr>
<tr>
<td>1947</td>
<td>2,119</td>
<td>66</td>
<td>† 1,135</td>
</tr>
<tr>
<td>1948</td>
<td>5,121</td>
<td>50</td>
<td>† 2,672</td>
</tr>
<tr>
<td>1949</td>
<td>4,827</td>
<td>66</td>
<td>- 294</td>
</tr>
<tr>
<td>1950</td>
<td>5,707</td>
<td>72</td>
<td>† 860</td>
</tr>
<tr>
<td>1951</td>
<td>8,013</td>
<td>67</td>
<td>† 2,306</td>
</tr>
<tr>
<td>1952</td>
<td>9,800</td>
<td>68</td>
<td>† 1,767</td>
</tr>
<tr>
<td>1953</td>
<td>10,389</td>
<td>70</td>
<td>† 589</td>
</tr>
<tr>
<td>1954</td>
<td>9,607</td>
<td>70</td>
<td>- 762</td>
</tr>
<tr>
<td>1955</td>
<td>9,551</td>
<td>70</td>
<td>- 56</td>
</tr>
</tbody>
</table>

semen from three different bulls, it was assumed that the trouble lay with the cow rather than with the bulls. At first, farmers charged the failure of his cow to conceive to the bull and artificial insemination. He had to be educated to the fact that in most cases it was either his management or disease and abnormality of the cow. In early operations vaginitis, a venereal infection which killed sperm, caused numbers of cows to fail in conception. With treatment, and bulls not being used in natural service, this disease was subdued. Farmers were asked not to call the technician unless the cow had calved sixty days or more previously. It was found that practically all cows were more likely to conceive at the middle or later part of estrus. If a cow did not have clear mucus discharge, the farmer was advised to wait until it was clear before having her inseminated. Cows coming in heat more often than eighteen days, were not to be inseminated but were to be treated by a veterinarian or someone experienced in treating cystic ovaries. In almost all cases, the farmer was advised to have a veterinarian check the cow if she had failed to conceive after the third insemination. Because of disease and various abnormalities of the reproductive tract, the technicians found that about ten per cent of all cows failed to conceive regardless of treatment and management. The association had Dr. Kallison\(^1\) check the herds having difficulties with low conception rates. He found the feeding of poor quality hay as the only roughage in winter to be a factor in low conception. Some herds were infected with Brucellosis. The State Department of
Agriculture\textsuperscript{2} inaugurated a calfhood vaccination program in 1949. Heifer calves were vaccinated for Brucellosis between the ages of four and eight months. This program, which has been in operation since 1949, has done much to solve the problem of low conception. This service did not cost the farmer anything but his cooperation in notifying the State Department of Agriculture that he had heifers ready for vaccination. Brucellosis, despite this program, was causing low conception rates in some herds because the owners failed to take advantage of the program. Heifers vaccinated later than eight months of age had difficulty in conception. Vaginitis caused trouble in some herds. The conception rate dropped when pasture were short and the weather dry. The best conception rates were obtained in spring and fall when pastures were flush.

\textsuperscript{1}Dr. C. A. Kallison, Assistant State Veterinarian, Tennessee State Department of Agriculture.

\textsuperscript{2}Edward Jones, State Commissioner of Agriculture, 1949.
CHAPTER VI

EVALUATION AND PROJECTION

Finances

The official audit for the calendar year 1955 enumerated the following:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash on Hand</td>
<td>$7,806.00</td>
</tr>
<tr>
<td>Accounts receivable</td>
<td>2,997.00</td>
</tr>
<tr>
<td>Supplies</td>
<td>1,768.00</td>
</tr>
<tr>
<td>Fixed assets</td>
<td>56,875.00</td>
</tr>
<tr>
<td>(barn, buildings, livestock)</td>
<td></td>
</tr>
<tr>
<td>TOTAL ASSETS</td>
<td>69,146.00</td>
</tr>
<tr>
<td>Reserve for depreciation</td>
<td>10,812.91</td>
</tr>
<tr>
<td>Accounts payable</td>
<td>26.19</td>
</tr>
<tr>
<td>TOTAL LIABILITIES</td>
<td>10,839.09</td>
</tr>
<tr>
<td>NET WORTH</td>
<td>58,606.91</td>
</tr>
</tbody>
</table>

It would appear that the association was in good shape financially. A careful analysis of the sources of the net worth would perhaps leave some question. More than fifty thousand dollars in financial aid came from the Tennessee State Department of Agriculture program for artificial insemination. Eight of the bulls in the stud were on loan from the Illinois Central Railroad. Four beef bulls in the stud were purchased by banks in the central territory.

The West Tennessee Artificial Breeding Association could not have erected the plant, purchased equipment and bulls from the fees
collected. From this standpoint, the financial position was unsound. The question that was left unanswered was, without this aid in the future, can the central association be self-sustaining unless the volume of business is greatly increased?

Markets

The Yorkville farmers, who milked cows, sold cream until the late forties and raised good hogs on the skim milk. There had been a cheese plant at Dyersburg. Some farmers sold milk there. The prices were low and for various reasons this market did not last.

Pet Milk Company established a receiving plant at Trenton in 1947. Milk routes were set up over most of the territory served by the West Tennessee Stud. Markets for Grade "A" milk developed at Newbern and Dyersburg. In 1955, a number of Grade "A" barns were in operation. There were Grade "A" markets in most of the larger towns over the territory. See Figure 2. Among these markets were Jackson, Huntingdon, Trenton, Union City, Dyersburg, Newbern, Humboldt and Milan. Crockett County Grade "A" milk went to Covington. Some milk went indirectly to the Memphis market.

Pet Milk Company has had a receiving plant at Martin in Weakley county since the twenties. This accounted for the leadership in dairying in that county. Weakley county sold $1,338,291 worth of dairy products in 1954 or 24 per cent of all dairy products sold in West Tennessee. See Table IV. Sealtest had a Grade "A" plant in Martin.
Figure 2. West Tennessee Artificial Breeding Association and Milk Markets Available.

- Outline of service area
- Headquarters of West Tennessee Artificial Breeding Association and Bull Stud
- Location of Grade "A" Markets
- Location of Pet Milk Company Receiving Plants
## TABLE IV

### VALUE OF DAIRY PRODUCTS WEST TENNESSEE 1954

<table>
<thead>
<tr>
<th>County</th>
<th>Value of Dairy Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benton</td>
<td>151,102.00</td>
</tr>
<tr>
<td>Carroll</td>
<td>363,938.00</td>
</tr>
<tr>
<td>Chester</td>
<td>97,021.00</td>
</tr>
<tr>
<td>Crockett</td>
<td>63,321.00</td>
</tr>
<tr>
<td>Decatur</td>
<td>16,592.00</td>
</tr>
<tr>
<td>Dyer</td>
<td>176,055.00</td>
</tr>
<tr>
<td>Fayette</td>
<td>256,342.00</td>
</tr>
<tr>
<td>Gibson</td>
<td>617,051.00</td>
</tr>
<tr>
<td>Hardeman</td>
<td>151,813.00</td>
</tr>
<tr>
<td>Hardin</td>
<td>20,457.00</td>
</tr>
<tr>
<td>Haywood</td>
<td>20,507.00</td>
</tr>
<tr>
<td>Henderson</td>
<td>125,531.00</td>
</tr>
<tr>
<td>Henry</td>
<td>568,197.00</td>
</tr>
<tr>
<td>Lake</td>
<td>10,486.00</td>
</tr>
<tr>
<td>Lauderdale</td>
<td>53,187.00</td>
</tr>
<tr>
<td>McNairy</td>
<td>76,200.00</td>
</tr>
<tr>
<td>Madison</td>
<td>143,383.00</td>
</tr>
<tr>
<td>Obion</td>
<td>163,131.00</td>
</tr>
<tr>
<td>Shelby</td>
<td>735,928.00</td>
</tr>
<tr>
<td>Tipton</td>
<td>107,661.00</td>
</tr>
<tr>
<td>Weakley</td>
<td>1,338,291.00</td>
</tr>
</tbody>
</table>

**TOTAL** 5,675,804.00

---

The nine counties covered by the Association sold 70 per cent of the dairy products of West Tennessee. The twelve counties not serviced sold the remaining 30 per cent of the total.

**Trends in Dairying**

In the nine counties serviced by the West Tennessee Artificial Breeding Association from 1950 to 1955, the number of dairy cattle had dropped 11,083 head or 16 per cent. See Table V. The number of farms reporting dairy cows dropped 5,214, or 26 per cent. This same trend was evident in all of the counties in West Tennessee. See Tables VII and VIII. The drop in farms reporting dairy cows and in dairy cow numbers would indicate less interest in dairying. Perhaps this could be attributed to the recession in the prices of dairy products during this period. The serious decrease in beef cattle prices was reflected in the lower salvage value of culled dairy cows. The average price for dairy cows for dairy purposes had fallen almost fifty per cent. The price squeeze on dairy cattle and dairy products and the stationary or rising costs of products bought by farmers could have caused the drop in numbers. The migration of labor to industry caused a shortage of competent dairy workers. The greater decrease in farms reporting dairy cows than the decrease in cow numbers would indicate more dairy cows per farm. At the same time the trend for the entire country was to fewer but larger herds. The dairy farmer without sufficient volume of business was gradually going out of the dairy business.
TABLE V

A COMPARISON OF THE FARMS REPORTING DAIRY COWS AND NUMBERS OF
DAIRY COWS IN AREA SERVED BY WEST TENNESSEE ARTIFICIAL
BREEDING ASSOCIATION FROM CENSUS OF 1950 and 1954

<table>
<thead>
<tr>
<th>County</th>
<th>Number of Farms Reporting 1950</th>
<th>Number of Cows 1950</th>
<th>Number of Cows 1954</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carroll</td>
<td>2,530</td>
<td>6,097</td>
<td>5,690</td>
</tr>
<tr>
<td>Crockett</td>
<td>1,859</td>
<td>4,447</td>
<td>3,287</td>
</tr>
<tr>
<td>Dyer</td>
<td>1,751</td>
<td>4,156</td>
<td>3,118</td>
</tr>
<tr>
<td>Gibson</td>
<td>3,611</td>
<td>11,665</td>
<td>8,561</td>
</tr>
<tr>
<td>Henry</td>
<td>2,107</td>
<td>6,516</td>
<td>6,276</td>
</tr>
<tr>
<td>Lake</td>
<td>202</td>
<td>139</td>
<td>265</td>
</tr>
<tr>
<td>Madison</td>
<td>2,403</td>
<td>6,595</td>
<td>5,250</td>
</tr>
<tr>
<td>Obion</td>
<td>2,087</td>
<td>9,551</td>
<td>6,647</td>
</tr>
<tr>
<td>Weakley</td>
<td>3,197</td>
<td>13,178</td>
<td>12,531</td>
</tr>
<tr>
<td>TOTALS</td>
<td>19,993</td>
<td>62,858</td>
<td>51,775</td>
</tr>
<tr>
<td>DECREASE</td>
<td>5,218</td>
<td></td>
<td>11,083</td>
</tr>
<tr>
<td>PER CENT DECREASE</td>
<td>26.1</td>
<td></td>
<td>17.63</td>
</tr>
</tbody>
</table>


### TABLE VI

**NUMBER OF FARMS REPORTING DAIRY COWS IN WEST TENNESSEE**

**AND NUMBER OF COWS PER COUNTY 1950**

<table>
<thead>
<tr>
<th>County</th>
<th>Number of Farms Reporting</th>
<th>Number of Cows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benton</td>
<td>1,119</td>
<td>2,018</td>
</tr>
<tr>
<td>Carroll</td>
<td>2,530</td>
<td>6,097</td>
</tr>
<tr>
<td>Chester</td>
<td>1,251</td>
<td>2,577</td>
</tr>
<tr>
<td>Crockett</td>
<td>1,859</td>
<td>4,447</td>
</tr>
<tr>
<td>Decatur</td>
<td>1,000</td>
<td>2,288</td>
</tr>
<tr>
<td>Dyer</td>
<td>1,754</td>
<td>4,156</td>
</tr>
<tr>
<td>Fayette</td>
<td>3,301</td>
<td>10,665</td>
</tr>
<tr>
<td>Gibson</td>
<td>3,614</td>
<td>11,665</td>
</tr>
<tr>
<td>Hardeman</td>
<td>2,167</td>
<td>6,086</td>
</tr>
<tr>
<td>Hardin</td>
<td>1,660</td>
<td>2,992</td>
</tr>
<tr>
<td>Haywood</td>
<td>2,503</td>
<td>6,653</td>
</tr>
<tr>
<td>Henderson</td>
<td>1,773</td>
<td>3,627</td>
</tr>
<tr>
<td>Henry</td>
<td>2,107</td>
<td>323</td>
</tr>
<tr>
<td>Lake</td>
<td>202</td>
<td>3,268</td>
</tr>
<tr>
<td>Lauderdale</td>
<td>1,591</td>
<td>3,808</td>
</tr>
<tr>
<td>McNairy</td>
<td>2,114</td>
<td>6,595</td>
</tr>
<tr>
<td>Madison</td>
<td>2,403</td>
<td>9,551</td>
</tr>
<tr>
<td>Obion</td>
<td>2,067</td>
<td>12,562</td>
</tr>
<tr>
<td>Shelby</td>
<td>2,933</td>
<td>5,145</td>
</tr>
<tr>
<td>Tipton</td>
<td>2,312</td>
<td>13,178</td>
</tr>
<tr>
<td>Weakley</td>
<td>3,197</td>
<td>6,516</td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td><strong>4,187</strong></td>
<td><strong>123,746</strong></td>
</tr>
</tbody>
</table>

---

TABLE VII

NUMBER OF COWS AND HEIFERS ON FARMS WITH THE NUMBER OF FARMS REPORTING IN WEST TENNESSEE, 1954*

<table>
<thead>
<tr>
<th>County</th>
<th>Cows No. Farms Reporting</th>
<th>Number Reported</th>
<th>Heifers and Calves No. Farms Reporting</th>
<th>Number Reported</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benton</td>
<td>737</td>
<td>1,698</td>
<td>471</td>
<td>1,698</td>
</tr>
<tr>
<td>Carroll</td>
<td>2,012</td>
<td>5,890</td>
<td>621</td>
<td>4,708</td>
</tr>
<tr>
<td>Chester</td>
<td>1,014</td>
<td>2,393</td>
<td>621</td>
<td>1,991</td>
</tr>
<tr>
<td>Crockett</td>
<td>1,316</td>
<td>3,287</td>
<td>1,060</td>
<td>3,910</td>
</tr>
<tr>
<td>Decatur</td>
<td>810</td>
<td>1,791</td>
<td>599</td>
<td>2,399</td>
</tr>
<tr>
<td>Dyer</td>
<td>1,217</td>
<td>3,118</td>
<td>1,063</td>
<td>7,029</td>
</tr>
<tr>
<td>Fayette</td>
<td>2,251</td>
<td>7,098</td>
<td>2,012</td>
<td>8,932</td>
</tr>
<tr>
<td>Gibson</td>
<td>2,652</td>
<td>8,561</td>
<td>1,947</td>
<td>9,136</td>
</tr>
<tr>
<td>Hardeman</td>
<td>1,626</td>
<td>5,180</td>
<td>1,250</td>
<td>5,356</td>
</tr>
<tr>
<td>Hardin</td>
<td>1,310</td>
<td>2,705</td>
<td>865</td>
<td>2,977</td>
</tr>
<tr>
<td>Haywood</td>
<td>1,914</td>
<td>4,729</td>
<td>1,518</td>
<td>6,295</td>
</tr>
<tr>
<td>Henderson</td>
<td>1,669</td>
<td>4,038</td>
<td>1,113</td>
<td>3,719</td>
</tr>
<tr>
<td>Henry</td>
<td>1,671</td>
<td>6,376</td>
<td>1,220</td>
<td>6,367</td>
</tr>
<tr>
<td>Lake</td>
<td>139</td>
<td>265</td>
<td>107</td>
<td>534</td>
</tr>
<tr>
<td>Lauderdale</td>
<td>1,210</td>
<td>2,472</td>
<td>990</td>
<td>4,673</td>
</tr>
<tr>
<td>McNairy</td>
<td>1,932</td>
<td>3,773</td>
<td>1,218</td>
<td>3,620</td>
</tr>
<tr>
<td>Madison</td>
<td>1,913</td>
<td>5,250</td>
<td>1,468</td>
<td>5,916</td>
</tr>
<tr>
<td>Obion</td>
<td>1,471</td>
<td>6,617</td>
<td>1,408</td>
<td>9,602</td>
</tr>
<tr>
<td>Shelby</td>
<td>2,006</td>
<td>7,691</td>
<td>1,923</td>
<td>10,012</td>
</tr>
<tr>
<td>Tipton</td>
<td>1,623</td>
<td>4,023</td>
<td>1,460</td>
<td>6,101</td>
</tr>
<tr>
<td>Weakley</td>
<td>2,356</td>
<td>12,351</td>
<td>1,797</td>
<td>8,826</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>32,831</td>
<td>99,296</td>
<td>25,446</td>
<td>113,839</td>
</tr>
</tbody>
</table>

The West Tennessee Artificial Breeding Association reported 4,760 members as of January 1, 1956, as shown in Table VIII. The membership was 32.5 per cent of the farms reporting dairy cows in the area served in 1954. However, the membership would give no indication as to the number of members who used the service in 1955.

**Shifts in Cow Numbers by Breeds**

The decrease in per cent of Jerseys bred in comparison with Holsteins and Herefords bred by the West Tennessee Stud had decreased from 63 per cent in 1952 to 53 per cent in 1955, a loss of 10 per cent. See Table IX. In the same period, Holsteins increased by 8 per cent. This seemed to be a significant trend, as the region had been predominantly Jerseys. Since the coming of whole milk markets into the region, Holstein numbers had rapidly increased. The 1955 insemination record showed more than half as many Holsteins inseminated as Jerseys. This trend indicated that farmers wanted higher milk production per cow rather than a high butterfat test, the price differential for extra fat not being enough to overcome the higher milk production.

The increase in per cent of cows bred to Hereford bulls was insignificant being only 2 per cent. This could indicate that a few more farmers were selling veal calves rather than raising dairy replacements.

**Plant**

The plant was adequate to serve the area and had the potential
### TABLE VIII

**TOTAL MEMBERSHIP WEST TENNESSEE ARTIFICIAL BREEDING ASSOCIATION BY LOCAL ASSOCIATIONS, JANUARY 1, 1956**

<table>
<thead>
<tr>
<th>Local Association</th>
<th>Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yorkville</td>
<td>1,685</td>
</tr>
<tr>
<td>Weakley</td>
<td>980</td>
</tr>
<tr>
<td>Henry</td>
<td>830</td>
</tr>
<tr>
<td>Madison</td>
<td>620</td>
</tr>
<tr>
<td>Carroll</td>
<td>665</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>1,760</strong></td>
</tr>
</tbody>
</table>

*Annual Report, West Tennessee Artificial Breeders Association, (Yorkville: 1956).*
TABLE IX

WEST TENNESSEE ARTIFICIAL BREEDING ASSOCIATION
COWS BREED BY BREEDS 1952-1955

<table>
<thead>
<tr>
<th>Year</th>
<th>Jerseys</th>
<th>%</th>
<th>Holsteins</th>
<th>%</th>
<th>Herefords</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1952</td>
<td>6,195</td>
<td>63</td>
<td>2,173</td>
<td>22</td>
<td>1,432</td>
<td>15</td>
</tr>
<tr>
<td>1953</td>
<td>6,272</td>
<td>60</td>
<td>2,798</td>
<td>27</td>
<td>1,319</td>
<td>13</td>
</tr>
<tr>
<td>1954</td>
<td>5,519</td>
<td>57</td>
<td>2,758</td>
<td>29</td>
<td>1,330</td>
<td>14</td>
</tr>
<tr>
<td>1955</td>
<td>5,106</td>
<td>53</td>
<td>2,866</td>
<td>30</td>
<td>1,561</td>
<td>17</td>
</tr>
</tbody>
</table>

to produce enough semen for all of West Tennessee. The laboratory was equipped to process, refrigerate and ship semen produced. The stud included seventeen bulls. The barn had plenty of stalls and storage facilities. Each bull had a padlock for grazing. The office had modern equipment. The Central Association had three houses on the grounds. They were modern homes for the manager and technicians. In 1956, a sales arena was built to hold sales of artificially sired dairy heifers and cows. All of the feed for the bulls was purchased.

Private Competition

A private company inseminating dairy cows has recently started operations in the area serviced by the West Tennessee Artificial Breeding Association. This competing company has operated in Alabama for the past three years. Autrey\(^1\) was well pleased with the service of the private concern in Alabama and stated that the working relationship between the Alabama Dairy Department and the company had always been on the best of terms.

The private company\(^2\) charged two dollars more for service fees in Alabama than it charged in a Tennessee county just across the state line where the Tennessee Breeders Association operated. This concern competed in many of the Middle Tennessee counties serviced by the Cooperative. In some of the counties two private

---

\(^1\) Letter from K. M. Autry, Head, Dairy Department, Alabama Polytechnic Institute to M. I. Revelle, dated June 26, 1956.

inseminating concerns were competing with the Cooperative. The Cooperative has suffered only a minor loss of business because of its intensive advertising through newspapers, radio programs, posters and hard work. The program of the private concerns was to knock the Cooperative's bulls and run them down in every manner possible.

Drake observed that there was not enough room for two artificial insemination concerns to operate in the same area. The nature of the operation requires concentration if the services are to be efficient. Cutting prices and unfair competition would eventually result in higher costs to the farmers who pay the bills. The private insemination concern has not been in operation in the area served by the West Tennessee Artificial Breeding Association long enough to evaluate its effect. The West Tennessee Artificial Breeding Association had an increase of thirty-one cows inseminated by the private concern in the area serviced. A large volume of business was necessary for a central bull stud. It would seem that any lessening of that volume would be detrimental. One favorable factor of the competition would be to keep the Cooperative Association more alert in all phases of its operation.

Frozen Semen

---

3Max Drake, Manager Northern Ohio Breeders Association, Tiffin, Ohio, 1954.
Frozen semen had not been used by the Yorkville stud. Swan-
son\(^1\) stated that there was no need for them to use it as they had
all of the fresh semen needed for their operation. It was found
that the cost of frozen semen was about one dollar per service
higher than liquid semen. This was due to processing and keeping
the semen at the low temperature. Two associations had turned to
frozen semen exclusively. Frozen semen required fewer bulls.
Semen was shipped less often and at less cost. Many associations
did not have refrigeration to produce the low temperature required
for frozen semen. Frozen semen was found to be the most revolu-
tionary development in artificial insemination since the begining
of artificial insemination in this country. Improved techniques
in processing and handling were in the process of being improved
almost constantly.

It seemed possible that through the use of frozen semen there
might be fewer studs in operation. If locals had storage facilities,
semen could be kept on hand. Farmers would have wider choice of
bulls. However, higher degree of skill and knowledge would be re-
quired to process and refrigerate the semen. If the West Tennessee
central had facilities for refrigeration of frozen semen, it would
then have been possible to service registered Guernsey cows, or
semen of any breed that the farmer desired.

\(^{1}\) E. W. Swanson, Dairy Department, University of Tennessee, 1956.
It has been stated that by using frozen semen, it would have been possible to breed a cow to any bull anywhere in the world, if the farmer would be willing to pay the cost. If frozen semen were used, it would be possible to inseminate all of the cows bred by the association with one bull's semen. No one bull has been bred that would suit all farmers, and farmers desire different breeds. The practical aspects of using frozen semen for the West Tennessee stud had not even been considered at the time this study was made. It would seem that with all of the attention the use of frozen semen has received, the West Tennessee Artificial Breeders Association would be forced to give careful consideration to its possibilities in the not too distant future.

Expansion

Doubts have been expressed as to the potential of the central stud for expansion. West Tennessee did not have the cow numbers of the other sections of the State. The larger the volume of business at the central stud the lower the cost per service. In 1954 there were 51,775 dairy cows in the nine counties serviced and 9,607 cows inseminated, or 19 per cent of the dairy cows. See Table X. During the same period Denmark artificially inseminated 57 per cent of the cattle in that country. At this rate the West Tennessee Stud would have inseminated 36,243 cows.

Twelve counties in West Tennessee were outside the service area of the Central Stud. One county got some service from Alcorn Association in Mississippi. A private company was operating in one
<table>
<thead>
<tr>
<th>Local Association</th>
<th>1951</th>
<th>1952</th>
<th>1953</th>
<th>1954</th>
<th>1955</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yorkville</td>
<td>3,186</td>
<td>4,238</td>
<td>4,406</td>
<td>4,293</td>
<td>4,500</td>
</tr>
<tr>
<td>Weakley</td>
<td>1,601</td>
<td>1,932</td>
<td>2,053</td>
<td>1,540</td>
<td>1,656</td>
</tr>
<tr>
<td>Henry</td>
<td>1,130</td>
<td>1,322</td>
<td>1,344</td>
<td>1,152</td>
<td>1,046</td>
</tr>
<tr>
<td>Madison</td>
<td>754</td>
<td>880</td>
<td>882</td>
<td>998</td>
<td>987</td>
</tr>
<tr>
<td>Carroll</td>
<td>911</td>
<td>1,097</td>
<td>1,177</td>
<td>1,111</td>
<td>1,129</td>
</tr>
<tr>
<td>South Mississippi</td>
<td>0</td>
<td>351</td>
<td>654</td>
<td>605</td>
<td>283</td>
</tr>
<tr>
<td>Shelby Mississippi</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>113</td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td>8,013</td>
<td>9,800</td>
<td>10,369</td>
<td>9,607</td>
<td>9,551</td>
</tr>
</tbody>
</table>

1Annual Report, West Tennessee Artificial Breeding Association, (Yorkville, 1956).
county. Seven of these counties reported on the possibilities of local associations. See Table XI. Two teachers reported that the possibilities were "good" in one county, another reported that they were "fair". Five reported the possibilities were "poor". The lack of concentrated cow population was the principle reason. If a technician could be employed part time until enough cows could be secured, an association might be organized in some counties. In others, the prospects were poor. However, there were 99,296 cows and 113,839 heifers in West Tennessee in 1954. See Table VII. With sufficient effort, it would appear that the potential for expansion of the West Tennessee Artificial Breeding Association has scarcely been touched.

Some plans, for making the Tennessee Artificial Breeders Association the central stud for the entire state, have been discussed in a meeting of the Boards of Directors of the West Tennessee Artificial Breeders Association, the Tennessee Artificial Breeders Association, and the East Tennessee Artificial Breeders Association. Various economies of operation could have been affected. Discussion broke down over the amount to charge for service fees. Agreements had been reached on a number of important items. The fact that groups from the three central associations met and discussed the idea of one association probably forecasts the time when the state will be serviced from one central association. The trend throughout the United States was toward larger central associations.
### TABLE XI

SURVEY OF WEST TENNESSEE VOCATIONAL AGRICULTURE TEACHERS IN AREAS NOT SERVED BY WEST TENNESSEE ARTIFICIAL BREEDING ASSOCIATION ON POSSIBILITIES OF A LOCAL ASSOCIATION IN THEIR AREA

<table>
<thead>
<tr>
<th>County</th>
<th>No. Reporting</th>
<th>Possibilities for organizing a local association</th>
<th>Good</th>
<th>Fair</th>
<th>Poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benton</td>
<td>2</td>
<td>xx</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fayette</td>
<td>1</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hardeman</td>
<td>2</td>
<td>xx</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Henderson</td>
<td>1</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hardin</td>
<td>1</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>McNairy</td>
<td>2</td>
<td>xx</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shelby</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>TOTAL</td>
<td>10</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>

*Correspondence with West Tennessee Vocational Agriculture teachers.*
CHAPTER VII

ROLE OF VOCATIONAL AGRICULTURE TEACHER

A survey of the teachers of vocational agriculture in West Tennessee revealed that twenty-one teachers, out of twenty-seven reporting from the area serviced by the West Tennessee central provided instruction on artificial insemination of dairy cows. Seven taught both all-day boys and adult farmers. Thirteen taught all-day boys only. One taught adults in evening classes only. Of the thirteen teachers reporting from outside the area, four taught all-day and evening classes and four taught all-day boys only.

The jobs taught as they appear in Table XII were listed under different headings by various teachers, yet it appeared that each teacher taught about the same jobs. Some teachers in the service territory revealed that there were very few dairy cattle in their school area.

Teachers have had a large number of responsibilities to perform. Helping promote artificial insemination of dairy cows was just one of them. It appeared that the number of teachers working to help promote the association was small as shown in Table XIII. Perhaps the people closely connected with it missed a good opportunity for some worthwhile assistance by not making a special effort to inform and encourage teachers of vocational agriculture in teaching and promoting the program.

Twenty-three vocational agriculture departments reported one
TABLE XII
ORGANIZED INSTRUCTION ON ARTIFICIAL INSEMINATION
BY TEACHERS IN WEST TENNESSEE

<table>
<thead>
<tr>
<th>Jobs Taught</th>
<th>No. of Departments</th>
<th>Number of Lessons</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Possibilities of artificial insemination</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>2. How to get service</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>3. Economy for small and large herds</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>4. Procedure for collecting and processing semen</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>5. Procedure for inseminating cows</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>6. Breeding for improvement of dairy cows</td>
<td>20</td>
<td>17</td>
</tr>
<tr>
<td>7. Explaining artificial breeding program</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>8. Field trip to breeding stud</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>9. Breeding troubles of cattle</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>10. Reproductive organs of bull and cow</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

*Questionnaire, West Tennessee Vocational Agriculture teachers, June, 1956.*
### TABLE XIII

SERVICES RENDERED BY VOCATIONAL AGRICULTURE
TEACHERS IN PROMOTING ARTIFICIAL INSEMINATION

<table>
<thead>
<tr>
<th>Services</th>
<th>No. Teachers Reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signed up all-day boys</td>
<td>5</td>
</tr>
<tr>
<td>Signed up adults</td>
<td>5</td>
</tr>
<tr>
<td>Encouraged dairymen to use service</td>
<td>6</td>
</tr>
<tr>
<td>Toured plant with dairymen</td>
<td>3</td>
</tr>
<tr>
<td>Informed farmers</td>
<td>4</td>
</tr>
<tr>
<td>Called for service for farmers</td>
<td>3</td>
</tr>
<tr>
<td>Recommended service</td>
<td>5</td>
</tr>
<tr>
<td>Promotional meeting</td>
<td>2</td>
</tr>
<tr>
<td>Taught veterans class</td>
<td>2</td>
</tr>
<tr>
<td>Used service themselves</td>
<td>4</td>
</tr>
</tbody>
</table>

1 Questionnaire, West Tennessee Vocational Agriculture teachers.
hundred and fifty-three Future Farmers used the service during the 1955-56 school year. Four hundred and eighty-eight cows were inseminated as shown in Table XIV. From the standpoint of putting into practice the lessons taught, this report was good.

The comments and criticisms offered by the teachers should prove helpful although the number reporting this item was small. Of the fifteen different comments reported, twelve were definitely associated with education from one or more sources as Table XV revealed.

The vocational agriculture teachers served school districts which practically cover the counties served by the West Tennessee stud. The same holds true for the other counties in West Tennessee. The teacher had a very definite role in the program. Artificial insemination practically eliminated good registered bulls from natural service.

Artificial insemination was just a part of the dairy enterprise. If the dairy enterprise were taught under the three subtitles of breeding, feeding and management, it would be hard to separate them entirely. In teaching artificial insemination all phases of breeding should be included. Teachers did not have the time to secure the information needed to teach these jobs.

Much closer cooperation between the officials of the central stud and the teachers of vocational agriculture was needed. A mimeographed copy of teaching plans with all of the factual information needed to teach all-day boys and adult classes could be
TABLE XIV

USE OF ARTIFICIAL INSEMINATION BY FUTURE FARMERS

<table>
<thead>
<tr>
<th>County</th>
<th>Voc-Agr. Depts. Reporting</th>
<th>Number</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Boys</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carroll</td>
<td>1</td>
<td>3</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Chester</td>
<td>1</td>
<td>3</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Crockett</td>
<td>2</td>
<td>10</td>
<td>53</td>
<td></td>
</tr>
<tr>
<td>Dyer</td>
<td>1</td>
<td>6</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Gibson</td>
<td>7</td>
<td>65</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Henry</td>
<td>2</td>
<td>16</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td>Madison</td>
<td>2</td>
<td>26</td>
<td>86</td>
<td></td>
</tr>
<tr>
<td>McNairy</td>
<td>1</td>
<td>1</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Obion</td>
<td>1</td>
<td>11</td>
<td>68</td>
<td></td>
</tr>
<tr>
<td>Shelby</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Weakley</td>
<td>1</td>
<td>8</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>TOTALS</td>
<td>23</td>
<td>150</td>
<td>488</td>
<td></td>
</tr>
</tbody>
</table>

Questionnaire, West Tennessee Vocational Agriculture teachers.
<table>
<thead>
<tr>
<th>Comments and Criticism</th>
<th>Frequency of Appearance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Have technician visit department once each year for discussion</td>
<td>1</td>
</tr>
<tr>
<td>2. Publish records of daughter-dam comparisons in each area occasionally</td>
<td>1</td>
</tr>
<tr>
<td>3. Technician take Voc. Agr. boys on field trip for demonstration of artificial insemination</td>
<td>1</td>
</tr>
<tr>
<td>4. More advertisement of the stud</td>
<td>3</td>
</tr>
<tr>
<td>5. Intensified educational campaign needed</td>
<td>4</td>
</tr>
<tr>
<td>6. Local association needed better telephone service</td>
<td>2</td>
</tr>
<tr>
<td>7. Would like to receive information on artificial insemination from the central</td>
<td>2</td>
</tr>
<tr>
<td>8. Teachers should do more for the service</td>
<td>2</td>
</tr>
<tr>
<td>9. Failed to get cows settled</td>
<td>1</td>
</tr>
<tr>
<td>10. Officials of association should do more educational service</td>
<td>1</td>
</tr>
<tr>
<td>11. More members</td>
<td>1</td>
</tr>
<tr>
<td>12. Service excellent</td>
<td>2</td>
</tr>
<tr>
<td>13. Keep a good wide awake technician</td>
<td>1</td>
</tr>
<tr>
<td>14. Farmers have production records on cows</td>
<td>1</td>
</tr>
<tr>
<td>15. Had not thought anything about it</td>
<td>1</td>
</tr>
</tbody>
</table>

*Questionnaire, West Tennessee Vocational Agriculture Teachers.*
worked up by the manager and one or two directors together with two
or three Vocational Agriculture teachers and mailed to each teacher.

The suggestion offered by a teacher for the manager, a tech-
nician, or a member of the Board of Directors to visit each voca-
tional agriculture department once each year and talk on artificial
insemination should be carried out if possible. A field trip with
the technician to inseminate a cow would be worthwhile.

A suggested outline for teaching:

Breeding Dairy Cattle

A. Principles of animal breeding
   1. Defining terms
   2. Grading up, purebreds, cross breeding, outcrossing
   3. Reproductive tracts of bull and cow

B. Selecting cows and heifers
   1. Type: weight; dairy tendency; age; mammary system; body
capacity; general appearance; health and vigor
   2. Production: milk and butterfat; standards necessary

C. Dairy Herd Improvement Associations
   1. Organization, operation, and costs
   2. Service rendered: production records, feed costs, returns
      above feed cost

D. Selecting bulls
   1. Type: its relation to reproduction
   2. Production
      a. Reading pedigrees: good and poor pedigrees;
dangers of selection by pedigree alone
      b. Proved bulls: production records on daughters;
number; where made; comparison of natural daughters
and artificial daughters; selected daughter records;
records made on a number of farms under varying con-
ditions; what to expect from proved sires.
E. Culling cows

1. Poor type
2. Low production
3. Diseases
4. Physical defects and abnormalities

F. Advantages and disadvantages of artificial insemination

1. Better bulls
2. Convenience
3. Eliminate dangers of keeping bull
4. Costs - compare with keeping bull
5. No choice of bull used
6. Cows require closer observation

G. Steps involved in artificial insemination

1. Securing semen from the bull
2. Processing, refrigerating and shipping semen
3. Technicians job: inseminating cows; keeping records; advising farmer and sanitation

H. Farmer cooperation in securing good conception rates

1. How to make service calls, reporting when cows came in heat
2. Have cow in convenient place, warm water and registration papers handy
3. Waiting until calf is sixty days old to breed cow
4. Have veterinarian treat cows after three services fail
5. Diseases and abnormalities, irregularities causing poor conception

I. The West Tennessee Artificial Breeding Association

1. A cooperative organization
2. Local associations
3. Services rendered
4. Membership duties and privileges
5. Financial set-up

Teachers of vocational agriculture could render valuable service both to the association and to farmers by teaching all phases of breeding dairy cattle to all-day boys and adult farmers. In supervising, they could give assistance to the program. Teachers needed concrete information and the association should make a special effort to supply
Summary
The Yorkville Community interest in Jersey cattle began in the eighteen nineties. Type as well as production has always received careful consideration. The Yorkville Jersey Show has been a part of the community life for twenty-seven years. The Yorkville Jersey Cattle Club led the way in the development of artificial insemination of dairy cows in West Tennessee.

The people have displayed an unusual spirit of pride and cooperation and have had the cooperation of the University of Tennessee, Illinois Central Railroad, banks, business firms, State Department of Agriculture, and Vocational Agriculture Departments.

The West Tennessee Artificial Breeding Association had given adequate service to its membership and had facilities to furnish semen for all of West Tennessee.

The conception rates were good. The association had exerted effort in diminishing the causes of poor conception.

The lack of proved bulls was a weak aspect of the program. The plans for proving young sires were inadequate.

The association received the larger part of its financial help from outside sources. The question unanswered was: could operations continue as they were without outside aid or an increase in volume of business?

There was evidence that the association's operations could be
greatly expanded in the area already serviced and also in the West Tennessee counties outside the territory being serviced.

Private competition has not operated for a long enough time to evaluate the results upon the volume of business of the association. Evidence from other associations indicates that two organizations could not operate successfully in the same territory.

The trend was toward larger central associations. Discussions between the directors of the three central associations in Tennessee about combining them with the Tennessee Artificial Breeding Association and having one stud for the state have taken place. If this action were taken, it would eliminate the West Tennessee Artificial Breeding Stud at Yorkville. Sectional and community pride would be a serious factor in combating this move.

Education has been needed in all phases of the dairy cattle breeding program. Vocational agriculture teachers were and are in a unique position to render this service in their work with adult farmers and high school boys.

Vocational Agriculture teachers have aided the program by teaching adult farmer classes, all-day boys in high school and in their supervision on the farms. They need information which could be supplied by the central association.
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BIBLIOGRAPHY

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Magazines


Caimon, Grant, "One Bull = 100,000 Calves a Year," Farm Quarterly, Vol. 10 (Summer 1955), pp. 40-41.


Miscellaneous


Is your service area serviced by the West Tennessee Artificial Breeding Association? ______________________

Yes or not

If your answer is no, what are the possibilities of an artificial breeding association in your county or area?

If your answer is yes, will you please answer the following questions?

1. Just what have you done in signing up cows for artificial insemination over the years?

2. Have you taught evening class lessons on artificial insemination? ______________________

Yes or no

Number of lessons ______________________

Please list jobs taught.

3. List the jobs on artificial insemination that you have taught to all-day boys:

4. Number of FFA boys who now use the service _______ No. of cows _______

Comments on the service in your area including ways in which the service could be made more effective in your area.
West Tennessee Artificial Breeding Association, Inc.
Yorkville, Tennessee

February 4, 1951

To WTABA Board of Directors:

This is to notify you of a special call meeting, next Friday night, February 9, 7:00 o'clock, WTABA Director's Room, Yorkville.

PURPOSE: The purpose of this meeting is to discuss with the interested bankers a plan for adding Hereford bulls to the stud. Discuss this program with your banker if you have not already done so. If he is interested in helping finance the purchase of these beef bulls invite him to come along to the meeting.

Any other business relative to the breeding association will be in order, also.

Please be on hand for the meeting next Friday night.

Very sincerely yours,

M. E. Forrester,
Secretary
West Tennessee Artificial Breeding Association
Yorkville, Tennessee

Annual Meeting Date: Wednesday, March 7, 1951; Time: 10:00 A.M.
Place: Yorkville High School Gymnasium. Barbecue lunch Free!
Principal Speaker: Eugene Myer, Hoard's Dairymen

Dear Member:

You are invited and urged to attend the SECOND ANNUAL MEETING of WTABA. Be sure to fill out the enclosed CARD and MAIL TODAY. WE MUST KNOW NUMBER TO PREPARE TO FEED.

DON'T MISS EUGENE MYER'S TALK, "ARTIFICIAL BREEDING, ONE LINK."
Mr. Myer, a breeder, 1939 Iowa 4-H State Judging Champion, 1942 Inter-collegiate Judging Champion, Iowa State graduate, former member of Farm News Department, Radio Station WHO, Des Moines, and Associate Editor Hoard's Dairymen since 1948, is well qualified to bring us much worthwhile information.

Others to appear on the program are: WTABA President, M. I. Revelle, WTABA Secretary-Treasurer, M. R. Forrester, and Manager Fred J. Hatler.

Commissioner of Agriculture, Edward Jones; State Extension Dairymen, L. O. Colebank; District Dairy Specialist, Clyde K. Chappell; Agriculture Representative Newbern State Bank, C. M. Jones; Agriculture Department, First Citizens National Bank, Dyersburg, Horace Dunagan; and Mr. Simmons, District Fieldman, Pet Milk Company, are expected to be present and take part on the program.

Your association has taken progressive steps since the last annual meeting. In October it moved into new headquarters one mile west of Yorkville on Highway 77. In addition to seven high quality Jersey bulls, four highly productive bred Holsteins have been added. Now, Hereford bulls are being added to help the small commercial beef man, the veal calf and baby beef man, with their breeding program. Agriculture-minded banks in the territory have cooperated in furnishing finances for the beef bull program. With three breeds in the stud most farmers should be able to make the choice that best suits his needs in breeding cattle.

NOTICE: All local units affiliated with WTABA are declaring March 7th a Technician's holiday, except Henry County. It is very important that the technicians attend the annual meeting. VISIT THE NEW BULL FARM WHILE IN YORKVILLE.

Very sincerely,
WEST TENNESSEE ARTIFICIAL BREEDING ASSOC.
This instrument becomes the membership agreement on acceptance by the Association. Being the owner of one or more cows I hereby apply for membership in the above organization. I agree, if accepted as a member, to be subject to the rules and regulations of the Association as presently in force or as they may be amended from time to time.

I further agree and guarantee:

First ——— Finances:

A. To pay $1.00 assessment fee per cow to be bred. Fifty Cents (50¢) of first dollar paid will be membership fee.

B. SERVICE FEES: To pay $5.00 service fee at the time each subscribed animal is first bred to start a new gestation period. If said animal fails to conceive, as many as two additional services will be made by the Technician without additional fee.

Second ——— Subscribed Animals:

To subscribe to the services of the Association Bulls during the fiscal year the following animals:

- No. _________ Jerseys
- No. _________ Holsteins
- No. _________ Herefords

Third ——— LIABILITY:

The member does hereby for himself, his heirs, representatives and assigns release the Association of their liabilities of every kind and nature arising or which might arise from any act of commission or omission on a part of any of the agents of the Association including the Technician.

The Association agrees to employ a Technician whose duty it will be to inseminate the subscribed cows of the members with viable semen taken from bulls by the Technician, and to perform such other functions as are listed in the Rules or By-Laws of the Association.
Signed __________________________ Address __________________________

RFD ________ Accepted this _____ day of ________ 19 ________.

WEST TENNESSEE ARTIFICIAL BREEDING ASSOCIATION, INC.
By ______________ Sec-Treas.

FEE PAID $ ____________.

NUMBER OF COWS SIGNED __________________________

I live ________ miles North ( ) South ( ) East ( ) West ( ) on
Highway No. __________, near town __________________ near
store __________________, live near Neighbor __________________.
WITH THE TECHNICIAN:

1. It is absolutely essential that you get your calls in not later than ten o'clock A.M. if you expect the technician to inseminate your cow that day. The reason for asking that you turn your call in not later than this time, is that the Technician has to drive over 100 miles daily and must leave Yorkville promptly at ten o'clock in order to make all calls.

If your cow comes in heat after twelve o'clock noon, make your call the next morning or call Mr. Hatler that afternoon giving the time you discovered your cow in heat. This would help him and also give you better service. I think you understand that if Mr. Hatler drives to Milan and while he is there you make a call to Yorkville and it does not get in before the time limit, and you too live near Milan, you can readily see that it would be impossible for him to return to Milan that day. Please keep this in your mind as the Technician must make as few unnecessary miles as possible in order to inseminate all the cows requested.

2. Please have animal in stall as Mr. Hatler does not have the time to get your cow out of the pasture.

3. A pail of hot water would be greatly appreciated during the winter months.

Feed your cows all of the good quality legume (lespedeza, soybeans, cowpeas, clover, alfalfa) hay she wants anytime she wants it is number one on the feed list for dairy cows.

Have you sowed your winter pasture yet? It is not too late to sow oats, rye, wheat, ryegrass. It is too late to get any fall pasture but it will be ready for early spring pasture.

Investigate the prices on cottonseed meal and Soybean meal. Usually it is wise to lay in a year's supply in the fall. The supply has been scarce during the war and is now. Cottonseed meal is the cheapest protein feed that we buy. It is hard to buy any feed better and more economical than crushed corn, some small grain and cottonseed meal for a concentrate feed.

Let's eliminate Bang's disease from our herds. Write Dr. C. E. Kord, State Veterinarian, State Office Bldg., Nashville 3, Tennessee for a blank to sign up your cattle for the test. Then have all heifers vaccinated between four and eight months of age as they come along.
They have been way behind in carrying out this program but have more men working now and should be able to keep up with the vaccinations.

Five of the first six heifers in the Yorkville Show were by artificial insemination.

Mr. Hatler inseminated 93 cows in August and 67 in September.

Tell your directors when you are dissatisfied with the service. Boost it to everyone else.

Join the Yorkville Jersey Cattle Club. The dues are $3.00 per year. This includes membership in Tennessee Jersey Cattle Club, and one year's subscription to the Jersey Bulletin. Send or hand it to M. R. Forrester, Secretary-Treasurer.

PEDIGREE OF ONE OF THE BULLS IN SERVICE.

Golden Volunteer Signal h39350 A.J.C.C. Classified Very Good.

Signal Estelle Volunteer
SIRE: h0 tested daughters average prod. 465 # fat. h7 Classified daughters average 64.84
He is the great bull owned by Shelby Co.
Penal Farm.

Afterglow Golden Stream, Classified EXCELLENT

DAM: Ton of Gold Cow
Lbs. Milk. % B.F. Better Fat days Age
11263 5.19 50.63 365 2-2 Afterglow's Observer
12044 5.56 673 363 3-6 53 Tested daughters averaging h85 # B.F.
11139 5.22 597 305 4-7 51 Classified Avg 61.75
10703 5.15 551 365 5-8 Volunteer Golden Stream
1347 4.97 668 365 6-9 2-tested progeny
CHAPTER I

A CASE STUDY OF THE WEST TENNESSEE
ARTIFICIAL BREEDING ASSOCIATION

The Problem

The purpose of this case study of the West Tennessee Artificial Breeding Association was to bring out the history, organization, operation, and future possibilities of the West Tennessee Breeding Association. For the purposes of study, the problem was analyzed into the following sub-areas:

A. Historical background
B. Agencies involved
C. Organization and operation
D. Difficulties encountered
E. Evolution and projection
F. Role of teacher of vocational agriculture

Importance of the Study

The West Tennessee Artificial Breeding Association was the only means of breeding dairy cattle available to a large number of farmers in that part of the state. Its continued operation rendering the best service possible was vital to these farmers. The future history of dairying in this section was largely depen-