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DAIRYING Annual Report 1923

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ANNUAL REPORT

AGRICULTURAL EXTENSION WORK

IN

DAIRYING

V.P.I. EXTENSION SERVICE

BLACKSBURG,

VIRGINIA

NOVEMBER 30, 1922 -to- DECEMBER 1, 1923

Project #8-

ANNUAL REPORT

EXTENSION WORK

IN

DAIRYING

NOVEMBER 30, 1922 -TO- DECEMBER 1, 1923

Respectfully submitted to:

Director Jno. H. Hutcheson,
V.P.I. Extension Service,
Blacksburg, Va.

December 1, 1923

Frank A. Buchanan

Frank A. Buchanan

Dairy Husbandman

V.P.I. DAIRY EXTENSION OFFICE

REPORT OF EXTENSION WORK IN DAIRYING

November 30, 1922 -to- December 1, 1923

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REPORT OF
EXTENSION WORK IN
DAIRYING

1. Introduction

a. Follow-up of 1922 Program of Work

The work of the V.P.I. Dairy Extension Office for the period between November 30, 1922 and December 1, 1923 was in general the continuation of the main projects as outlined in the previous year's program of work, namely: organization and supervision of co-operative cow testing associations; assistance in organizing and developing co-operative milk producers marketing associations and general dairy development, such as: talks given at local group meetings of dairy farmers; assistance in conducting breeders co-operative sales; judging and arrangement of exhibits at agricultural fairs, etc.

There were several new projects added to the program of work for 1923; the most important being the Pure-bred Bull Campaign which was a co-operative project with the Animal Husbandry Department in which twenty-five (25) county agents enlisted. Another important new project for 1923, was a Dairy and Alfalfa Campaign held in Shenandoah County in co-operation with the V.P.I. Agronomy Department.

Extension Work in dairy manufactures included as a new project, a "Cream Grading Campaign," held among the creamery operators of the Valley Section.

b. Personnel

Up to July 1, 1923, the personnel in extension work in dairying included the services of F.A. Buchanan, as dairy husbandman, W.D. Saunders, as cheese specialist, and I.G. Gibson, as specialist in dairy manufactures. On July 1, 1923, the college authorities instituted a re-organization of the Dairy and Animal Husbandry Department, creating a Dairy Department which included both dairy production and dairy manufactures. In this re-organization, F.A. Buchanan was given the status of 1/3 time extension dairying and 2/3 time resident college work. The other members of the staff in dairy extension remaining the same as previous to July 1.--- In August, 1923, Mr. L.P. Emmerick was added to the staff as assistant dairy husbandman to do field work in dairy production.--- On November 1, 1923, Mr. I.G. Gibson resigned from the staff to accept a similar position at the University of Missouri.

e. **Assignment of Projects**

Beginning with 1923, the field of projects in extention work in dairying were assigned to members of the staff so that the various projects could be more definitely carried on. The projects in dairy production, including: cow testing association work, better sire campaigns, and dairy herd management projects, were assigned to F.A. Buchanan. Extension projects with co-operative milk marketing associations and projects in dairy products, were assigned to L.G. Gibson. The dairy extension project in cheese development, was assigned to W.D. Saunders. When Mr. Emmerick entered the extension staff, dairy production projects were assigned to him.

II Section I ---- DAIRY PRODUCTION

Project B - Virginia Co-operative Cow Testing Associations

1 - Supervision of Active Associations

A. - Augusta County Cow Testing Association

This association was re-organized and enlarged during the month of December, 1922. The membership was increased from 12 to 22 members and a full-time tester was employed for the year 1923.

Co-operators: P.C. Manley, county agent, W.S. Campfield, assistant county agent. Field assistance was also given by H.H. Holler, president of the association, and H.M. McManaway, secretary of the association.

Enrollment: There are twenty-two (22) members and three hundred and seventy-five (375) cows.

Field Work: Four days were necessary to be spent in assisting the reorganization of this association. Two trips were made in supervising the work of the tester.

Results:

Number of cows tested for yearly records	---	356
" " herds " " " "	---	20
" " cows producing over 40# fat per month during year	---	221
" " cows producing over 50# fat per month during year	---	93
" " unprofitable cows sold	---	76
" " pure-bred bulls bought by members	---	7
" " pure-bred cows " " "	---	5
" " new silos	---	3
" " new members	---	1

B. - Albemarle County Cow Testing Association

This association was re-organized during December, 1922 with a total membership of twenty-seven (27). A full-time tester was employed for the year 1923.

Co-operators: S.S. Teel, county agent, Geo. H. Carey, president of the association, and A.P. Howard, secretary of the association.

Enrollment: There are twenty-seven (27) members and 574 cows.

Field Work: One trip was necessary, spending three days in re-organizing this association. Four trips have been made in supervising the work of the tester.

Results:

Number of cows tested for yearly records	---	574
" " herds " " " "	---	27
" " cows producing over 40# fat per month during year	---	283
" " cows producing over 50# fat per month during year	---	65
" " unprofitable cows sold	---	83
" " pure-bred bulls bought by members	---	8
" " pure-bred cows bought " "	---	25

C. - Culpeper County Cow Testing Association

This association was active December 1, 1922 with a full-time tester employed for the year 1923.

Co-operators: B.P. Williams, county agent, and J.O. Sulivan, secretary of the association.

Enrollment: At the beginning of the year there were thirteen (13) members with a total of six hundred (600) cows.

Field Work: Three trips have been made in supervising the work of the tester.

Results:

Number of cows tested for yearly records	---	491
" " herds " " " "	---	12
" " cows producing over 40# fat per month during year	---	602
" " cows producing over 50# fat per month during year	---	198

Number of unprofitable cows sold	---	104
" " pure-bred bulls bought by members	---	5
" " " " cows " " "	---	1
" " new members	---	2

D. - Fairfax County No. 1 Cow Testing Association

This association was active December 1, 1922 with a full-time tester employed for the year 1923. A change of testers in this association occurred in August, 1923.

Co-operators: H.B. Derr, county agent, and B.W. Middleton, secretary of the association.

Enrollment: At the beginning of the year there were twenty-seven (27) members, with 723 cows.

Field Work: Three trips, totaling eight days have been made instructing two new testers. One trip supervising work of tester.

Results:

Number of cows tested for yearly records	---	723
" " herds " " " "	---	27
" " cows producing over 40# fat per month during year	---	1,486
" " cows producing over 50# fat per month during year	---	452
" " unprofitable cows sold	---	74
" " pure-bred bulls bought by members	---	3
" " " " cows " " "	---	10
" " new members	---	4
" " new silos	---	3
" " new barns	---	2

E. - Fairfax County No. 2 Cow Testing Association

This association was re-organized in December 1922, employing a full-time tester for the year 1923. A change of testers was made in August 1923.

Co-operators: H.B. Derr, county agent, C.T. Rice, president of the association, and B.H. Whittig, secretary of the association.

Enrollment: Nineteen members, with 325 cows.

Field Work: Four days spent re-organizing the association. Two trips of one day each, instructing new tester. Four trips have been made inspecting work of tester.

Results:

Number of cows tested for yearly records	---	325
" " herds " " " "	---	19
" " cows producing over 40# fat per month during year	---	209
" " cows producing over 50# fat per month during year	---	42
" " unprofitable cows sold	---	39
" " pure-bred cows bought by members	---	11

F. - Henrico County Cow Testing Association

This association was active December 1, 1922. At the beginning of the association year it was found difficult to get a competent man as tester for the association and between December 1, 1922 and July 1, 1923, a total of five different testers were used in this association. On July 1, a competent college graduate was secured as tester and the work has been progressing since that time.

Co-operators: W.L. Kirby, county agent, H.W. Gills, president of the association, and G.L. Oliver, secretary of the association.

Enrollment: Fifteen members, with 569 cows.

Field Work: Five trips were made in supervising the work of the tester in this association. Two trips have been made securing additional members for the association.

Results:

Number of cows tested for yearly records	---	569
" " herds " " " "	---	15
" " cows producing over 40# fat per month during year	---	414
" " cows producing over 50# fat per month during year	---	106
" " unprofitable cows sold	---	26
" " pure-bred bulls bought by members	---	2
" " " " cows " " "	---	8

G. - Loudoun Valley Cow Testing Association

This association, which is the oldest association in the state, was active December 1, 1922 and a full-time tester was employed for the year 1923. A change of testers was made in June 1923.

Co-operators: J.R. Lintner, county agent, and W.T. Brown, secretary of the association.

Enrollment: Nineteen members, with 587 cows.

Field Work: One trip was made in supervising the work of this association.

Results:

Number of cows tested for yearly records	---	587
" " herds " " " "	---	19
" " cows producing over 40# fat per month during year	---	579
" " cows producing over 50# fat per month during year	---	136
" " unprofitable cows sold	---	63
" " pure-bred bulls bought by members	---	4
" " " " cows " " "	---	2

H. - Orange County Cow Testing Association

This association was active December 1, 1922. A change of testers was made in February, 1923.

Co-operators: R.V. Breeden, county agent, and W.L. Bradbury, secretary of the association.

Enrollment: Fourteen members, with 306 cows.

Field Work: Three trips have been made supervising work of the association.

Results:

Number of cows tested for yearly records	---	306
" " herds " " " "	---	14
" " cows producing over 40# fat per month during year	---	435
" " cows producing over 50# fat per month during year	---	154
" " unprofitable cows sold	---	26
" " pure-bred bulls bought by members	---	1

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Number of pure-bred cows bought by members	---	1
" " new members	---	6

I. - Prince William County Cow Testing Association.

This association was active December 1, 1922 with a full-time tester employed for the year 1923. The same tester for 1923 will continue for 1924.

Co-operators: W.L. Browning, county agent, and H.H. Sanders, secretary of the association.

Enrollment: Twenty-four members, with 555 cows.

Field Work: Two trips made supervising work of tester.

Results:

Number of cows tested for yearly records	---	555
" " herds " " " "	---	24
" " cows producing over 40# fat per month during year	---	528
" " cows producing over 50# fat per month during year	---	186
" " unprofitable cows sold	---	55
" " pure-bred bulls bought by members	---	6
" " " " cows " " "	---	4

J. - Piedmont Cow Testing Association

This association was active December 1, 1922 and continued operation until February, 1923, when it disbanded because of the lack of an efficient man as tester and of the inability to secure a good man to continue the work at that time.

K. - Rockingham County Cow Testing Association

This association was in operation as a small association, December 1, 1922 and employed only a part-time tester. Beginning July 1, 1923 the association was enlarged, employing a full-time tester.

Co-operators: C.W. Wampler, county agent, E.M. Minnick, president of the association, and J.S. Roller, secretary of the association.

Enrollment: December 1, 1922, -- 8 members with 100 cows

July 1, 1923, --16 members with 242 cows

Field Work: Re-organization, three days. Instructing new tester, one trip of two days. Supervision of testers work, three trips totaling four days.

Results:

Number of cows tested for yearly records	---	242
" " herds " " " "	---	16
" " cows producing over 40# fat per month during year	---	257
" " cows producing over 50# fat per month during year	---	75
" " unprofitable cows sold	---	18
" " pure-bred bulls bought by members	---	4
" " " " cows " " "	---	10

L. - Spotsylvania-Stafford Cow Testing Association

This association was active December 1, 1922 and continued operation until June 1923, when it disbanded because of the lack of interest in the work and greatly decreased membership.

M. - Southwest Virginia Cow Testing Association

This association was active December 1, 1922 only as a small association; the tester finding other employment for the time he was not engaged as cow tester. It is the plan to confine the territory of this association to include only the dairy farmers in Washington County, where there appears to be sufficient interest to employ a full-time tester.

Co-operators: County Agents, W.E. Schmidt and E.C. Grigsby.

Enrollment: Ten members with 250 cows.

Field Work: One trip for re-organization of association.

Results:

Number of cows tested for yearly records	---	250
" " herds " " " "	---	10
" " cows producing over 40# fat per month during year	---	108

Number cows producing over 50# fat per month during year	---	33
" unprofitable cows sold	---	51

N. - Peninsular Cow Testing Association

This association was re-organized in May 1923 and the membership was confined to dairy farmers in the counties of James City, Warwick and York. A full-time tester was employed at the time of re-organization.

Co-operators: E.M. Slauson, county agent and W.E. Gilley, secretary of the association.

Enrollment: Twenty-two members, with 298 cows.

Field Work: Re-organization, two trips totaling four days. Supervision of tester, two trips.

Results:

Number of cows tested for yearly records	---	298
" " herds " " " "	---	22
" " cows producing over 40# fat per month during year	---	123
" " cows producing over 50# fat per month during year	---	17
" " unprofitable cows sold	---	120
" " pure-bred bulls bought by members	---	4
" " " " cows " " "	---	4

O. - Center Virginia Cow Testing Association

This association was organized to begin operation, November 1, 1923 with members including dairy farmers in Amelia and Nottoway counties. A full-time tester was employed to begin, and considerable interest is being shown by the members in the work of that association.

Co-operators: R.B. Oliver, and C.W. Richards, county agents.

Enrollment: Twenty-two members, with 525 cows.

Field Work: Organizing association, three trips totaling eight days. One trip of two days instructing new tester.

Results:

Number of cows tested for yearly records	---	525
" " herds " " " "	---	22

2. - Northern Valley Cow Testing Association

This association was organized to begin operation November 1, 1923. The membership including dairy farmers in the counties of Frederick, Warren and Clarke.

Co-operators: H.L. Moore, county agent, R.B. Crawford, county agent, J.E. Haldeman, president of the association, and W.H. Newman, secretary of the association.

Enrollment: Twenty members, with 275 cows.

Field Work: Five trips totaling ten days in organizing and securing members for this association.

Results:

Number of cows tested for yearly records	---	275
" " herds " " " "	---	20

3. PUBLICITY

A. Extension Division News

The publicity work for the development of cow testing associations and dairy herd improvement has been largely through the columns of the Extension Division News, when in September 1922 there was established an individual page in this publication for the use of Dairy Extension work. The nature of the material published on this page has been in the form of monthly summaries of the cow testers monthly reports, a column article on some timely subject regarding dairy herd management, and other news items of general interest to dairy farmers. See Exhibit A

B. Newspaper Articles

In addition to the publicity in the Extension Division

News, there has been published on an average of two news articles each month in the various dairy farm papers, and other publications.

C. Cow Testing Association Annual Reports

During the year efforts have been made to have the cow testers in the various associations compile reports after the completion of the association year and arrange for advertising space, or other means of financing such a report. The Fairfax County Association No. 1, with Mr. L.P. Rumerick as cow tester, was the first association to print an annual report, which was completed about March, 1933. This report is very complete and speaks well of the high quality of work being done by the cow testers of that association. See Exhibit B

The Prince William County Cow Testing Association completed a very good report which is being mimeographed to be distributed among the association members throughout the state.

The Culpeper County Cow Testing Association completed its report and had mimeographed brief summaries of the results of the association for the year.

There were a total of nine associations to complete the herd summaries for the association year. Most of these summaries were tabulated and yearly summaries made at the Dairy Division, United States Department of Agriculture, Washington, D.C.

3. Supervision and Extension of the Virginia Registry of Production.

The Virginia Registry of Production work was started in the Virginia Cow Testing Associations beginning December 1, 1922, with the idea of encouraging better methods of herd management and increasing the interest of the members in their cow testing association work. See Exhibit C

Considerable interest has been taken in this work and the following information shows the results of this work for the year:

Number of Cows for which Application has been made in the Virginia R.O.P., November 30, 1922 - 215

Number of association members who have entered cows in the R.O.P. - 51

Number of records for which certificates have been issued - 25

The first twenty-five cows to finish in the Virginia Registry of Production made an average of 10,072.0 pounds of milk, with 392.4 pounds fat. The requirement in the R.O.P. is only 305 pounds fat in ten months. Thus, the first twenty-five cows have exceeded the requirement by an average of 87 pounds butter fat per cow. The highest individual R.O.P. record which has been completed was made by "Dijkstra Pontiac Jeannette" a pure bred Holstein cow owned by H.L. Butler & Sons, Culpeper, Virginia, whose record is 17,325.5 pounds milk with 585.6 pounds butter fat.

Another cow which is entered in the R.O.P. but whose record is not quite complete at this time, is a grade Holstein cow "Sadie" owned by Mr. Ben Middleton, Herndon, Virginia, whose record appears to be approximately 20,000.0 pounds milk with 760 pounds butter fat. The yearly record of this cow is expected to become the 2nd. highest record for a grade cow in the United States.

4. Training Testers for Association Work

During the year it was necessary to give some time in training cow testers, both at the office and also in the field. The amount of time given in training testers in the field is found in the summary, and the amount of time in the office is as follows:

Number of testers trained in office --- 7

5. SUMMARY OF RESULTS IN VIRGINIA COW TESTING ASSOCIATIONS.

	1922	1923
Number of Associations	12	14
Number of Old Associations Re-organized		4
Number of New Associations Organized		2
Number of Members in Associations	215	267
Number of Cows on Test	5,130	6,276
Number of Cows Producing over 40# fat in one month, per year		5,456
Number of Cows producing over 50# fat in one month, per year		1,557
Number of Unprofitable Cows Sold		726
Number of Pure-bred Bulls Bought By Members		44
Number of Pure-bred Cows Bought By Members		81
Number New Members Added		76

VIRGINIA COW TESTING ASSOCIATIONS.

Name of Association	Location	Number of Herds Tested	Number of Cows Tested
Albemarle C.T.A.	Albemarle Co.	27	574
Augusta C.T.A.	Augusta Co.	20	356
Center Virginia C.T.A.	Amelia & Nottoway	22	525
Culpeper C.T.A.	Culpeper Co.	12	491
Fairfax Co. No.1. C.T.A.	Fairfax Co.	27	723
Fairfax Co. No. 2. C.T.A.	Fairfax Co.	19	325
Henrico C.T.A.	Henrico Co.	15	569
Loudoun Valley C.T.A.	Loudoun Co.	19	587
Northern Valley C.T.A.	Shenandoah, Frederick, Warren & Clarke Counties	20	275
Orange C.T.A.	Orange Co.	14	306
Peninsula C.T.A.	James City Co.	22	298
Prince William C.T.A.	Prince William Co.	24	555
Rockingham Co. C.T.A.	Rockingham Co.	16	242
Southwest Va. C.T.A.	Pulaski & Washington	10	250
TOTALS	14 Associations	267	6,276

Project II - BETTER BULL CAMPAIGN IN VIRGINIA

This project was arranged in cooperation with the Animal Husbandry Department. There were twenty-five (25) county agents entered in this contest. Exhibit D outlines the rules governing this campaign for 1923. -- See Exhibit D

The results of this campaign as reported by the county agents, up to November 1, 1923, are as follows:

Number scrub-bulls replaced with pure-bred dairy bulls	---	17
Number scrub-bulls replaced with pure-bred beef bulls	---	68
Total Number of Bulls Replaced	---	85

This project resulted in demands from county agents for assistance in the following counties:

Prince William
Shenandoah
Rockbridge
Campbell

1. Organisation of Cooperative Bull Associations

In these four counties efforts were made to organize a Cooperative Dairy Bull Association. The work has resulted in the organization of the Prince William County Cooperative Holstein Bull Association, which consists of four blocks with eight members.

Plans are at present under way for the organization of a bull association in Campbell County, and the association is expected to be completed before the end of 1923.

2. Dairy Bull Sales

During the period of this report there was one dairy bull sale, held in Albemarle County. At this sale there were twelve bulls offered. This department assisted in selecting the animals for this sale, which was held by the county agent.

Project III - GENERAL DAIRY DEVELOPMENT

Under this project will come the results secured in the development of dairying in Virginia through miscellaneous projects and through the assistance given by the department to State Breeders Associations, The Club Department, The State Dairymens Association, Agricultural Fairs, etc.

1. DAIRY BREED ASSOCIATIONS

A. - Breeders Consignment Sales

During the period of this report the following breeders sales were attended and assistance given before the time of sale, and also at the time of sale:

Dispersal Sale - Mannsfield Hall Farm - Jerseys		
Total Number of Cattle Sold	--- 46	
Dispersal Sale - Snowden Farm - Jerseys		
Total Number of Cattle Sold	--- 54	
Virginia Holstein-Friesian Breeders Consignment Sale		
Total Number of Cattle Sold	--- 66	
Breeders Assisted	--- 14	
Average Sale Price	--$164.40	per head.
Guernsey Breeders Consignment Sale, Burkeville, Va.		
Total Number of Cattle Sold	--- 40	
Average Price	--$231.00	per head

B. - County Herds

This department assisted in the selection of county herds in the following counties, which were to be shown at the Virginia State Fair, 1923:

Augusta County Guernsey Herd
Orange County Jersey Herd

The following county herds were exhibited at the State Fair, 1923, largely through the efforts of this department in stimulating this project:

Fairfax County Guernsey Herd
Stafford County Guernsey Herd
Henrico County Holstein Herd

C. - State Breeders Associations

The three following breeders associations were active during the period of this report, and assistance was given them in various projects which they under-took:

Virginia Jersey Cattle Club
Virginia Guernsey Cattle Club
Virginia Holstein-Friesian Breeders Club

Each of these associations held their regular annual meeting at the time of the State Dairymens Convention in March, 1923. The Jersey Breeders held a summer meeting at Fredericksburg, Virginia. The Holstein-Friesian Breeders Club held a summer meeting at the time of Farmers Institute, at which time plans were made for the entertainment of the National Holstein-Friesian Convention, which is to be held at Richmond, Virginia, in June 1924.

2. BOYS AND GIRLS DAIRY CALF CLUBS

Some assistance was given to county agents in locating and purchasing dairy calves for Calf Club Members.

A. - Instruction to Club Members

Some assistance was given to the Club Department of the Extension Service in giving instructions to club members at the following Short Course:

State Short Course - Held at the College

The instructions given at the State Short Course consisted of a short instructional course of three days, to the Calf Club Members, in dairy projects, at the end of which a contest was

given for the selection of a dairy judging and demonstration team which should be given further training for competition in the National Contest, and for a demonstration at the Virginia State Fair.

B. - Training Dairy Club Demonstration Team

Between the time of the State Short Course and the Virginia State Fair, 1923, some time was spent in the field assisting the county agents and local leaders in training the three club members selected for the State Demonstration Team to go to the National Dairy Show in October. A trip of four days with the club members was made in the Valley of Virginia, visiting representative dairy herds to study type and breed selection.

1. Demonstration at Virginia State Fair 1923.

At the time of the Virginia State Fair in October, two public demonstrations were held on three consecutive days, by the club demonstration team. These demonstrations were well attended and much interest created in the work of this team. See Exhibit B

2. National Dairy Club Contest

The three members composing the Virginia Club Judging and Demonstration Team were as follows:

Miss Reefa Hoover,	Timberville, Va.
Mr. Walter S. Flory, Jr.,	Bridgewater, Va.
Mr. Forrest Hedrick,	Richmond, Va.

This team competed in the National Junior Judging Contest at the National Dairy Show, Syracuse, New York, October 6th., and made the following placings in the contest:

In the National Judging Contest there were 21 states competing and the Virginia team stood 6th place.

Forrest Hedrick of the Virginia team was first in the judging of Jersey cattle in this contest. Miss Reefa Hoover of the Virginia team was fifth in this contest in the judging of Holstein cattle.

In the National Demonstration Contest there were 17 states competing and the Virginia team placed fifth in the contest.

3. DAIRY COMMUNITY DEVELOPMENT

A. - General Meetings

Dairy Community Development throughout the state consisted in assisting county agents with general meetings of dairy farmers who were interested in some phase of dairy production. There were held during the year, eight meetings of general interest to dairy farmers with a total attendance of 485.

B. - Dairy and Forage Crop Campaign

A project held in cooperation with the V.P.I. Agronomy Department consisted of a general dairy development campaign in Shenandoah County, giving assistance to County Agent H.L. Moore. This campaign was known as the Dairy and Forage Crop Campaign and consisted of a series of meetings lasting four days, held throughout the county, most of them being small group meetings of farmers on their farms. At each meeting there was a speaker on dairying from this office and also one on forage crops from the Agronomy Department.

The results of this campaign were as follows:

Total Number of Meetings	---	32
Total Number of People Addressed	---	1,500

During these local group meetings questionaires were presented to the farmers at these meetings. See Exhibit F

There were secured a total of 150 of these signed questionaires. The follow-up work by this department in this campaign was the organization of a Cooperative Dairy Bull Association. Three days were spent following this campaign visiting farmers relative to the organization of this bull association, but it seems that there was not sufficient interest in this work at that time to complete the organization.

Among the results of this campaign was the creating of considerable interest in the necessity for the use of pure-bred bulls in the herds and creating an interest in cow testing association work. A cow testing association was organized in this territory in October, which is partly due to the work of the campaign in the spring. The Agronomy Department also reports a great deal of interest in that section in the use of legumes on the farms.

C. Purchasing Dairy Cattle for Community Development.

During the period of this report assistance was given to county agents in purchasing car-loads of dairy cattle to be distributed in their counties. The cattle were purchased as follows:

1 - Car-load grade and pure-bred Holsteins purchased near Madison, Wisconsin, and shipped to Westmoreland County, assisting County Agent L.H. Walker.
Number of head purchased --- 22

1 - Car-load grade Jersey cattle, purchased in Charles Town, Indiana, and shipped to Rockbridge County, assisting County Agent M.G. Lewis
Number of head purchased --- 27

The Jersey cattle purchased were distributed in the county by means of a promotion sale.

4. Virginia State Dairymens Association

During the period of this report F.A. Buchanan has acted as secretary of the Virginia State Dairymens Association, and the following work has been accomplished by this association:

A. - Annual Convention

On March 8 & 9, 1923 the Sixteenth Annual Convention of this association was held at Charlottesville, Va. A very instructive program was arranged, and some of the important addresses given were as follows:

"Setting up a Farmers' Co-operative Marketing Association."
Director Jno. H. Hutcheson, V.P.I. Extension Service, Blacksburg, Va.

"The Dairyman's Part in the Successful Marketing of Dairy Products."
A.A. Borland, Professor Dairy Husbandry, State College of Pennsylvania

"Balancing the Dairy Ration,"
W.J. Fraser, Professor of Dairy Husbandry,
University of Illinois.

The average attendance at this convention was approximately three hundred (300) for each session.

At the time of this convention arrangements were also made for the annual meeting of the three State Dairy Breed Associations

B. - Growth of the Association

Through the efforts of the secretary the association has increased its membership from 190 members to approximately 300 members and plans are under way at the present time for the association to have passed in the next legislature an "Anti-Filled Milk Bill" in the state of Virginia.

The association has also stimulated the work of the Virginia Registry of Production, and is making plans to enlarge this project during the coming year.

C. - Annual Report

See Exhibit -- C

5. Agricultural Fairs

A. - Judging at County and Community Fairs

During the period of this report the usual number of requests came to this office for giving assistance to the county agents in judging the dairy cattle at the local county or community fairs. The following field work in this project was done by members of this department:

9 - County or Community Fairs Judged.

In each case when judging was done at the local fairs it was endeavored to make the judging a demonstration by educating the people attending the fairs as to what were the essential characteristics of dairy type.

B. - Exhibits at Virginia State Fair

An exhibit on dairying was prepared for the Virginia State Fair, 1923, which consisted of an automatic balopticon machine which allowed the showing of lantern slides on ground glass. Each slide was automatically changed every few seconds so that there was a continuous story being revealed by the series of slides shown. A photograph of the exhibit booth is shown by Exhibit H attached to this report.

In addition to this exhibit at the State Fair, there was also held, as outlined in this report, a public demonstration on the "Selection, Feeding and Management of the Dairy Calf," presented by the Dairy Calf Club Demonstration Team.

Section II -- COOPERATIVE DAIRY MARKETING

1. Cooperative Milk Producers Associations

During the period of this report considerable assistance was given by members of this department in helping with the development of the Cooperative Milk Producers' Associations, whose membership was in Virginia. There were six of these cooperative associations assisted. Most of the assistance rendered these organizations was in the matter of educational development to teach the members economic production and quality production. Some assistance was also given the officers of these associations in enlarging the membership of the associations and developing the organization.

The following Milk Producers Associations were assisted:

A. - Valley of Virginia Milk Producers Association

Membership -- 600
Secretary or Manager -- F.A. Driver, Manager, Harrisonburg, Va.

More assistance was given to this association than other associations since it was only recently organized. Mr. I.G. Gibson, from this office, spent considerable time in introducing to the officers of this association a new system of accounting. He also gave help in attending field meetings among the members and in general advise, particularly in regard to the plant management of the association.

Mr. F.A. Buchanan held several conferences with the officers, the executive committee and board of directors of this association, relative to the development of the association.

B. - Maryland-Virginia Milk Producers Association

Membership -- 500 (Virginia)
Secretary or Manager -- O.A. Jamison, Mgr., 101 Q. St. N.E. Washington, D.C.

Assistance was given to this association in general dairy development work.

C. - Shenandoah Valley Milk Producers Association

Membership -- 150
Secretary or Manager -- E.E. Colladay, Sec'., Woodstock, Va.

This association has, during the period of this report, financed and erected a plant to handle the products from the members of the association. This plant began operation about July 1, 1923, and has created renewed interest in dairying in that section since the prices that the association has been paying has caused the competitive buyers to raise the price of their products.

D. - Peninsular Dairymens Association

Membership -- 45
Secretary or Manager -- Willard Gilley, Sec'y., Williamsburg, Va.

This association, though small, has been quite active in locating a market for the members. A new market was found for their products in the city of Norfolk, and the members at the present time are arranging to produce the quality of milk necessary to sell in that city. Several trips were made to this association and among the projects which have been completed, is the organization of a cow testing association, consisting of twenty-two members and 298 cows.

E. - Pittsylvania County Dairymens Association

Membership --- 25
Secretary or Manager -- E.B. Foote, President,
Milton, N.C.

This association has not been very active during this year but several meetings have been held in connection with the proposed holding of a milk campaign in the city of Danville. We did not feel that the dairymen in that section were cooperating sufficiently to justify the holding of a milk campaign. It is hoped that within the coming year we can establish a cow testing association in that section among the members of this association.

F. - Bristol Cooperative Dairymens Association

Membership --- 45
Secretary or Manager -- R.F. Hays, Sec'y.,
R.F.D.
Bristol, Va.

This association was organized in the month of November, 1923, and already the price of milk in the city of Bristol has been stabilized and the price of butter fat at the local plants has been increased for the coming winter. It is hoped that this association will, in the future, develop a central distributing plant for the products of the members of the association. Plans are already under way for the establishment of a good cow testing association among the members of this association.

Section -- III - DAIRY MANUFACTURES

Project I - Cheese Development

This project was in the entire charge of Prof. W.D. Saunders, cheese specialist, Extension Division, and a complete report will be made by Prof. Saunders.

Project -- II - Other Dairy Products

Extension Work in Dairy Manufactures in this office has been under gradual development in the past few years, but no full-time projects have, as yet, been developed. Several demands have been made on this office for assistance with projects in dairy manufactures, which have been filled without interruption, to work along the other projects outlined in this report. During the past year, up to November 1, Mr. I.G. Gibson has been in charge of the projects in dairy manufactures, and his complete report will cover the activities of extension work along this project.

IV - MAP - LOCATION AND DISTRIBUTION OF PROJECTS IN DAIRYING DURING 1923 -- SEE MAP EXHIBIT I

V FIELD SUMMARY

(F.A. Buchanan)

Meetings or Conferences With:	Meetings or Conferences	Agents Assisted
1. County Agricultural Agents	94	28
2. Home Demonstration Agents	0	0
3. U.S. Dairy Division Workers	5	3
4. College Agricultural Workers	4	0
5. Cow Testers	35	17
6. Local Leaders	44	60

FIELD SUMMARY

(L.P. Emmerick)

Appointed -- August, 1923

	Meetings or Conferences	Agents Assisted
1. County Agents	28	20
2. U.S. Dairy Division Workers	3	1
3. Cow Testers (17 cow testers)	29	0
4. Local Leaders	27	0

VI - OFFICE SUMMARY

(F.A. Buchanan)

1.	Number of Miles Traveled by Railroad	17,209
2.	" " " " " Automobile	1,534
3.	" " Visits to Counties	66
4.	" " Different Counties Visited	28
5.	" " Speeches Made	58
6.	" " People Addressed	2,048
7.	" " People Met or Visited	296
8.	" " Letters Written	2,527
9.	" " Days in Office	183
10.	" " Days in Field	151
11.	" " Days Annual Leave	22
12.	" " Days Sick Leave	8

OFFICE SUMMARY

(L.P. Emmerick)

Appointed -- August, 1923

1.	Number of Miles Traveled by Railroad	8,048
2.	" " " " " Automobile	1,448
3.	" " People Addressed	110
4.	" " People Met or Visited	159
5.	" " Letters Written	177
6.	" " Days in Office	39
7.	" " Days in Field	86
8.	" " Days Annual Leave	0
9.	" " Days Sick Leave	0

Frank A. Buchanan

Frank A. Buchanan

Dairy Husbandman

L.P. Emmerick

L.P. Emmerick

Asst. Dairy Husbandman

December 1, 1923

DAIRY EXTENSION NEWS

WHY HAVE GRADES?

Do grade cows pay, when compared with pure breds? O yes, some of them are good producers and occasionally a grade cow will produce more milk than some pure bred cow, but what will average grade cows produce, compared with pure bred cows?

From the annual report of the Prince William Cow Testing Association, which completed a year's work September 1st, we find these facts:

There were 342 complete years' records of grade cows which showed the following averages for the year:

Butter fat production	293.9 lbs.
Average feed cost	$86.50
Average income over feed cost	$137.59

The 53 yearly records of pure bred cows in this association showed the following averages:

Butter fat production	316.0 lbs.
Average feed cost	$93.15
Average income over feed cost	$176.18

This was an average difference in profit over feed cost for only one year of $38.59 in favor of having a pure bred cow. Multiply this by the number of grade cows in your herd. The result will be your loss. But, suppose you have grades — what are the calves worth?

Pure bred cattle in your herd indicates progress and prosperity. Raise more, buy more, and breed the best-better.

Sell Dairy By-products to the Best Markets

The dairy cow is the most profitable "machine" for converting crops produced on the farm into the best known human foods, milk and butter-fat. These two products of the dairy cow are the "main products" but if success is to be attained in dairying, the "by-products" of the dairy cow must be sold to the best advantage.

Here again the dairy cow proves to be the most profitable converter of farm feeds, because the by-products from the dairy cow are so valuable. One of the most valuable by-products of the dairy cow is skim-milk. There are two good markets through which "skim-milk" may be sold and receive the top price for the product. These markets are the *hen* and the *pig*. The following results of experiments show the good price that may be obtained for skim-milk when fed to the hen or pig:

Two pens of hens at Perdue University were selected so as to be as nearly identical as possible. Own sisters were put in each pen. One pen was fed the standard grain and mash ration, while the other pen was fed the same ration with the addition of skim-milk. In the pen that received grain only, the yearly average production was only 32½ eggs, while the production of the pen that had skim-milk added to the same ration, was 135 eggs, for the same year. The cost of each dozen of eggs produced where *no* skim-milk was fed was 35c, while the cost per dozen where skim-milk was fed was only 9c. Commercially, skim-milk is considered to be worth about 25c per hundred-weight, but when fed to poultry, as in the above experiment; the skim-milk was worth $2.04 per hundred-weight.

The value of skim-milk when fed to pigs is shown in an experiment in which 18 uniform pigs were selected, each weighing around 60 pounds; and these were separated into three lots of six pigs each. The first pen was fed a good standard grain ration, with linseed meal added; the second pen received the same grain ration, with skim-milk fed as a supplement; and the third pen received the same grain ration, with soy bean meal added. The second lot, or the one receiving skim-milk made a *net profit* of $21.60; the lot receiving the linseed meal made a net profit of $9.17, while the lot receiving soy bean meal made a net profit of $9.70. From this experiment, the skim-milk or dairy by-product is worth 73c per hundred pounds, when fed to the hog, compared with linseed meal, and 71c per hundred pounds when compared with the soy bean meal.

From these facts there is but one conclusion; that the dairy cow is man's best machine on the farm, through which he can sell at the best prices the hays, stovers and grains produced on the farm. The pig and hen are his best markets for the by-product of the cow.

Not only does the dairy cow provide a good market for farm products but she does more, since on dairy farms the fertility of the land is maintained and future generations will rise up to possess lands of greater fertility and increased prosperity.

The best time to fix farm machinery is before it needs repairing.

Good farmers are found on good farms.

Now that the crops are in, it's about time to begin those improvements you promised your wife.

HIGHEST RECORD COW IN EACH ASSOCIATION—Month of September

Association	Owner	Breed	Milk (lbs.)	Fat (lbs.)
Albemarle	Cedar Gate Farm	P. B. J.	1040	56.10
Augusta	E. M. Coiner	P. B. G.	1510	70.97
Culpeper	H. L. Butler & Sons	Holstein*	2504	81.40
Fairfax No. I	F. N. Mohler	Gr. Hol.	1818	64.40
Fairfax No. II	Dr. F. W. Huddleson	Gr. Ger.	952	63.70
Loudoun	W. L. Simpson	Gr. J.	1214	68.00
Henrico	X. Beck	Gr. Hol.	1586	62.00
Orange	J. S. Andrews	P. B. J.*	1116	71.40
Peninsula	J. W. Flatten	Hol.	1285	58.30
Prince William	C. C. Lynn	Gr. Angus	1308	62.20
Rockingham	M. D. Rhodes	P. B. G.*	1265	61.98
Southwest Va.	H. M. Daniels	Jersey	855	51.30

*This cow also on "official" test.

HIGHEST TEN COWS IN ALL ASSOCIATIONS—Month of September

Association	Owner	Breed	Milk (lbs.)	Fat (lbs.)
Culpeper	H. L. Butler & Sons	Holstein*	2504	81.40
Orange	J. S. Andrews	Jersey*	1116	71.40
Augusta	E. M. Coiner	Guern.	1510	70.97
Loudoun Valley	W. L. Simpson	Gr. J.	1214	68.00
Fairfax No. I	F. N. Mohler	Gr. H.	1815	64.40
Fairfax No. II	Dr. F. W. Huddleson	Gr. G.	952	63.70
Prince William	C. C. Lynn	Gr. Angus	1308	62.20
Henrico	X. Beck	Gr. Hol.	1586	62.00
Rockingham	M. D. Rhodes	P. B. G.*	1265	61.98
Peninsula	J. W. Flatten	Hol.	1265	58.30
Albemarle	Cedar Gate Farm	Jersey	1040	56.10

*This cow also on "official" test.

TEN BEST HERD AVERAGES FOR ALL ASSOCIATIONS—Month of September

Association	Owner	Breed	Cows	Milk (lbs.)	Fat (lbs.)
Culpeper	H. L. Butler & Sons	Holstein	7	1454.0	47.40
Orange	J. S. Andrews	P. B. J.	23	655.4	37.30
Rockingham	M. D. Rhodes	P. B. G.	15	764.0	36.38
Augusta	A. F. Weaver	Guern.	8	620.3	34.76
Loudoun	L. Clarke Hoge	P. B. G.	18	745.0	34.20
Fairfax No. I	Ben. Middleton	Hol. & Guern.	29	997.3	33.27
Albemarle	W. B. Colthurst	Hol.	12	817.0	33.00
Peninsula	R. H. Farthing	Gr. G.	15	864.0	32.10
Southwest Va.	H. M. Daniels	Jersey	16	679.0	32.10
Prince William	C. M. Rhodes	Grades	15	760.7	31.60
Henrico	X. Beck	Hol.	18	857.0	31.30

AVERAGE PRODUCTION IN EACH ASSOCIATION—Month of September

Association	Tester	No. cows tested	Avg milk prod. (lbs.)	Avg. B. F. prod. (lbs.)	No. cows Honor Roll	No. cows over 40 lbs. B. F.
Albemarle	C. E. Gordon	378	459.2	19.30	7	23
Augusta	G. S. Davis	356	530.7	22.75	9	26
Culpeper	F. O. Scott	500	666.3	23.81	9	31
Fairfax No. I	T. V. Armstrong	674	601.3	24.27	13	67
Fairfax No. II	J. J. Wall	380	567.0	22.70	7	35
Henrico	Sterling Simpson	613	558.0	22.00	5	35
Loudoun	S. R. Poole	606	482.0	21.30	6	42
Orange	J. B. Fink	322	582.1	26.60	15	41
Peninsula	Robert Brame	276	576.0	22.60	3	12
Prince William	T. T. Curtis	547	536.5	20.40	14	40
Rockingham	J. M. Wayman	206	512.0	22.47	8	26
Southwest Va.	Harold Straw	420	564.0	23.50	1	4

HONOR ROLL—VIRGINIA "OFFICIAL" TESTING—September

(All Cows Producing in One Day Two Pounds Butter Fat or More)

Owner	Name	Breed	Milk (lbs.)	Fat (lbs.)
Bowmont Farms, Salem	Viola's Fern Rosebud, 459635	Jer.	71.4	4.0914
H. L. Butler & Sons, Culpeper	Dykstra Vale Pontiac Girl, 596114	Hol.	164.1	5.2400
C. E. Gardner, Rapidan	Van Huff Sadie Vale, 642926	Hol.	141.4	4.5500
L. C. Hoge, Leesburg	Rose of Brooklandwood, 75802	Guern.	88.4	4.0797
V. P. I., Blacksburg	Gay Lad's Marion, 54492	Guern.	94.8	4.2900
V. P. I., Blacksburg	Gay Lad's Helen, 95606	Guern.	90.7	4.1969
F. S. Walker, Woodberry Forrest	Rozni Elmonia Rag Apple, 456482	Hol.	133.5	4.4000
F. S. Walker, Woodberry Forrest	Rozni Gertrude Rag Apple, 455791	Hol.	136.3	4.5500
Whittig & Drew, McLean (1 day test)	Duchess Lady of Kenilworth, 137510	Guern.	41.7	2.1230

VIRGINIA COW TESTING ASSOCIATIONS SUMMARY FOR MONTH OF SEPTEMBER

Number of associations	12
Number of herds tested	134
Number of cows tested	5472
Number of testers reporting	12
Number of cows producing over 40lbs. but. fat	389
Number of cows on honor roll	13
Number of unprofitable cows sold	107

VIRGINIA "OFFICIAL" TESTING SUMMARY

Month of September

Number of herds tested	45
Number of Holsteins tested	136
Number of Jerseys tested	66
Number of Guernseys tested	70
Number of Shorthorns tested	3
Number of cows on honor roll	9

ALS IN SOUTHWEST VIRGINIA

For several years the barberry bush has played an important role in the propagation and spread of the black stem rust of wheat in Foster Falls, Barren Springs and Jackson's Ferry sections of Wythe County. The situation has become so serious that it is now a question of barberry or wheat in these sections and those adjacent to them.

During the summer of 1923, the Federal Department of Agriculture at Washington, and the Plant Pathology Department of the V. P. I., joined forces. Dr. F. E. Kempton, of the Federal Department, who is in charge of the barberry eradication campaign in 13 north central states where this work is being carried on at the present time, inspected several wheat fields in the stricken areas in company with specialists of the V. P. I. Extension Division. In all cases where wheat fields were examined, the native barberry bush was found to be the factor determining a wheat crop, a partial wheat crop, or no wheat crop at all. To briefly sum up the situation, it is a case of wheat or barberry in these stricken areas. The farmers in these sections realize the seriousness of the "barberry pest" and have decided unanimously to back up any movement having as its aim the getting rid of the barberry. At any rate some progress has been made in this direction, for a trained man was stationed in southwest Virginia during the month of August to carry on work of killing the barberry with applications of chemicals. Work has also been done in locating the bushes. It is hoped that the State Agricultural Experiment Station at Blacksburg will be able to procure state funds to study this problem and carry the work to completion.

A six panal exhibit is being displayed at the State Fair carefully illustrating and explaining the relation of the barberry bush in the spread of black stem rust of cereals. Information on this disease and others of economic importance will be furnished on writing the Plant Pathology Department, V. P. I., Blacksburg, Virginia.

Black stem rust is the world's most destructive disease of cereals. It attacks both spring and winter, wheat, oats, barley and rye. It is the limiting factor in small grain production throughout the great spring wheat area of the upper Mississippi Valley, while in some regions it is so prevalent every year that small grains cannot be grown at all. In 1916, rust reduced the yield of spring wheat about 200,000,000 bushels. Thousands of acres were never harvested and hundreds of farmers were ruined. The Plant Disease Survey of the United States Department of Agriculture reports the following losses from rust in the thirteen North Central States in the past six years: Wheat, 144,000,000 bushels: oats, 93,000,000 bushels; barley, 26,000,000 bushels; and rye, 2,000,00 bushels. The average annual loss of these four grains is 44,000,000 bushels.

Black Stem Rust is a tiny mold-like parasite which steals the plant food which should go to the kernels. In the spring the rust grows on the leaves of the common and native barberry bush, where it forms "cluster cups." These "cluster cups" produce countless millions of tiny seeds, called "spores," which are blown about by the wind. They may fall on the grains or grasses, sprout during the damp weather, and send minute, root-like threads into the plants. In about ten days more spores are produced. These break through the skin of the stem, forming the familiar brick colored streaks of "rust." The summer spores infect other grains and grasses, but

HOW TO DISTINGUISH THE KINDS OF BARBERRY
COMMON BARBERRY JAPANESE BARBERRY
(This cut loaned through courtesy of The Minnesota Agricultural Experiment Station)

If there were no common or native barberry, the black spores in the spring would be absolutely harmless. To prevent rust, all common barberry bushes must be found and destroyed. The common barberry is a tall erect shrub often as much as twelve feet high. The native barberry is similar to the common barberry but smaller. The bark is grayish and there are spires along the stem, usually in groups of three or more. The leaves are green or purple, and have saw-tooth edges. The small yellow flowers and bright red berries are in long drooping clusters like currants. The common and native barberry should not be confused with the Japanese barberry, which is harmless and should not be destroyed. The Japanese variety is a low, graceful spreading shrub, seldom more than four or five feet tall. The bark is reddish and the small spines are usually single or in threes. The edges of the leaves are smooth. The flowers and berries are in clusters like gooseberries.

Barberry eradication to prevent black rust has become a great public movement in the thirteen North Central States. The U. S. Department of Agriculture and the thirteen states declared war against the common and native barberry in 1918 and by the end of 1922 a careful search had been made for the bushes on the farms in 427 counties and in most of the cities and towns. Almost 6,000,000 bushes had been found and more than 5,000,000 removed. There remains to be covered 394 counties, while much of the area already surveyed must be gone over again for sprouts and seedlings from former plantings. Up to June 30, 1923, Congress had provided almost $1,000,000 for barberry eradication. For the fiscal year 1923-1924 Congress appropriated $425,000 and the states about $50,000. In 1922 farmers, business men and state officials formed the conference for the Prevention of Grain Rust to co-operate with state and federal government.

Annual Report

of the

FAIRFAX COUNTY, VA. COW TESTING ASSOCIATION No. 1

1922

OFFICERS

BEN MIDDLETON, *President*
ALLEN BRADLEY, *Vice President*
WM. MIDDLETON, *Secretary and Treasurer*

Foreword

IN the first four months of this last testing year the cow population of the Association was almost doubled, so in order to be able to include these cows and herds in this report with a full year's work, and in order to make certain tabulations possible, each herd was allowed to finish its year's work. For this reason the testing year is not indentical in all cases. While some herds finished their year as early as December 1922 others did not finish until March. 1923. However, it represents 12 months work for each herd.

Herd averages were based on the number of cow years. A cow year represents one cow entered for 12 months, or it may represent 2 cows entered for 6 months, 3 cows for 4 months, etc. In this way every cow in the Association for no matter how short a time is represented in our herd averages, and we do not exclude 2 year old heifers freshening during the year, and low producers sold for beef.

The Fairfax County, Virginia, Cow Testing Association No. 1

Location and History

AN hour's ride out of Washington D. C. on the Washington and Old Dominion electric line brings you to the thriving little town of Herndon, the center of Fairfax County, Va., Cow Test Association No. 1 and in the heart of the best dairy section of the South. This section is one of the oldest and best known dairy sections below the Mason-Dixon line, and its reputation for good dairy cows has long made it a buying center for buyers from further south.

The Fairfax Co. No.1 Cow Test Association was first organized in December 1919 and has just finished its third year of continued existence. The first year's work started with considerable enthusiasm but the Association was unfortunate in its choice of testers, so the less said about the first year the better. The Association did manage to worry itself through the year much to the credit of its members. The second year it was fortunate in getting Mr. George Carey as tester. Mr. Carey at first had considerable trouble to interest the farmers in testing, due to the disastrous results of the first year, but due to his good and hard work throughout the year, he was able to regain the repute that cow testing had lost.

This last year the work was taken over by Mr. Emmerick our present tester, who has continued Mr. Carey's good work, so that today the Association has a filled up membership and has a number of applicants on the waiting list.

HIGH COW

Champion Year's Record Grade Cow of the South

Sadie, a grade Holstein, five years old, owned by Mr. Ben Middleton of Herndon, Virginia, was the high cow for the past testing year. Her record of 18,490 lbs. milk and 729.6 lbs. butterfat equivalent to 912 lbs. butter also makes her the champion grade cow of the state and the south for a year's work. Her average test for the year was 3.95%.

This record was made on two milkings a day, ordinary farm care and feeding, and as she was never pushed at any time there is every reason to believe that had she been milked three times daily and given the chance some cows have, that she would have made herself the champion grade cow of the United States.

Her milk was shipped to Washington, D. C., as fluid milk bringing an average farm price of $2.95 per cwt., making an income of $545.21. Her roughage consisted of corn silage and mixed clover hay. Her roughage, including pasture, was valued at $41.30 and the grain at $119.62, or a total feed bill of $160.92 leaving an income over feed of $384.29. Her grain was "Larro" dairy ration during the greater part of the year. There was a return of $3.39 for every dollar invested in feed.

She was dry three weeks, after which time there was a big fine heifer calf. Due to her fine showing during the past year, Mr. Middleton is going to milk her three times daily, for at least the first few months and if she continues as she is starting out she will far surpass her last year's record.

Table No. 1

The following table gives the averages per cow in the various herds.

Herd No.	No. of Cow Yrs.	Lbs. Milk	Lbs. B. F.	Value of Product	Cost of Roughage	Cost of Grain	Total Feed Cost	Income Above Feed Cost	Ret'ns per $1.00 Exp'd for Feed	Feed Cost 1 Lb. B. F.	Feed Cost 100 Lb. Milk
1	46.75	9,974	392.0	303.04	43.80	82.14	125.94	177.10	2.46	.32	1.26
2	14.92	11,096	375.1	342.29	46.01	103.90	149.91	192.38	2.28	.40	1.35
3	17.30	9,218	359.6	273.09	49.39	72.75	122.14	150.95	2.24	.34	1.33
4	22.25	8,815	348.5	268.10	46.54	65.31	111.85	156.25	2.39	.32	1.27
5	20.50	8,603	340.9	248.04	40.40	67.02	107.42	140.62	2.31	.31	1.25
6	29.25	8,544	337.8	259.15	40.29	64.75	105.04	154.11	2.47	.31	1.23
7	25.30	8,960	335.3	249.32	46.52	56.17	102.69	146.63	2.43	.31	1.15
8	31.16	8,758	331.9	253.72	43.05	77.37	120.42	133.20	2.11	.40	1.37
9	18.40	7,485	331.3	225.85	36.74	45.61	82.35	143.50	2.74	.25	1.10
10	17.08	8,591	319.9	239.60	42.94	68.42	111.36	128.24	2.15	.35	1.30
11	19.65	8,108	319.0	244.41	41.32	62.94	104.26	140.15	2.34	.33	1.28
12	28.90	8,224	311.9	233.78	44.79	56.34	101.13	132.65	2.31	.32	1.23
13	21.25	8,585	311.8	204.85	42.81	51.50	94.31	110.54	2.17	.30	1.10
14	12.40	7,509	306.6	233.47	35.26	58.56	93.28	140.19	2.50	.30	1.24
15	20.90	7,044	305.6	265.27	39.98	51.78	91.76	173.51	2.89	.30	1.30
16	28.00	7,890	298.5	220.85	38.64	79.51	118.15	102.70	1.87	.40	1.50
17	22.80	7,341	282.0	205.74	36.92	50.95	87.87	117.87	2.34	.31	1.20
18	31.30	6,910	274.8	204.73	38.38	48.83	87.21	117.52	2.35	.32	1.26
19	13.58	7,517	274.0	217.92	44.57	54.01	98.58	119.34	2.21	.36	1.31
20	51.65	6,053	272.4	188.95	46.31	46.38	92.69	96.26	2.04	.34	1.53
21	11.67	6,300	269.1	197.51	42.08	67.72	109.80	87.71	1.80	.41	1.74
22	29.90	5,918	268.9	183.62	34.99	42.55	77.54	106.08	2.37	.29	1.37
23	51.40	6,925	261.0	196.88	51.10	43.58	94.68	102.20	2.08	.36	1.37
24	30.00	5,763	256.0	206.31	38.77	59.76	98.53	107.78	2.09	.38	1.71
25	17.08	6,783	255.5	153.38	43.33	38.58	81.91	71.47	1.87	.32	1.21
26	30.50	6,541	243.9	185.94	46.31	46.38	92.69	96.26	2.01	.38	1.42
Av'ge	665.89	7,726	305.4	228.78	42.54	57.91	100.45	128.33	2.28	.36	1.30

Five High Herds

Owner	*Av. No. of Cows*	*Milk Prod.*	*B'fat Prod.*
J. R. McMillen	46.8	9974	382.0
P. B. Crandall	14.9	11096	375.1
L. C. Ferguson	17.3	9218	359.6
Wm. Ellmore	22.3	8815	348.5
M. Perkins	20.5	8603	340.9

HERD PURE BRED HOLSTEINS
Owned by Mr. P. B. Crandall

Ten High Cows

Owner	Cow's Name or Number	Milk Prod.	Test	B'fat Prod.	Total Value of Prod.	Cost of Roughage incl. Pasture	Cost of Grain	Total Feed Cost	Val. of Prod. Above Cost of Feed
Ben Middleton	Sadie	18,490	3.95	729.6	$545.21	$41.30	$119.62	$160.92	$384.29
J. R. McMillen	No. 11	15,527	4.18	647.3	487.94	44.21	110.26	154.47	333.47
J. R. McMillen	No. 3 Jane	17,529	3.40	595.6	502.53	44.21	112.53	156.74	345.79
J. R. McMillen	No. 13	13,550	3.85	523.5	401.07	33.53	91.50	125.03	276.04
F. N. Mohler	No. 2	14,769	3.51	518.3	403.71	44.14	102.25	146.39	257.32
L. C. Ferguson	Big Prince	12,051	4.16	503.2	371.96	50.70	97.88	148.58	223.38
F. N. Mohler	No. 23	13,711	3.67	501.8	394.09	43.00	89.73	132.73	261.36
J. R. McMillen	No. 16	13,459	3.74	501.2	399.35	44.21	98.29	142.50	256.85
Ben Middleton	Feb.	14,708	3.36	493.2	421.64	41.30	93.82	135.12	286.52
J. R. McMillen	No. 26	10,833	4.49	486.3	360.84	44.21	82.15	126.36	234.48

High Cow In Each Herd

Owner	Name of Cow	Breed	Milk Prod.	Test	B'fat Prod.
M. E. Middleton	White Face	Gd. Ayr.	9076	4.43	402.0
Allen Bradley	No. 17 Rachel	Gd. Hol.	12876	3.28	422.8
L. C. Ferguson	Big Prince	" "	12051	4.16	503.2
Wm. Ellmore	No. 13	" "	12540	3.49	438.2
R. B. Nickell	No. 9	Gd. Guer.	7183	5.41	388.3
A. G. McClearen	Big Guer.	" "	8688	4.14	359.3
R. L. Harrison & Sons	Belle	Gd. Hol.	10639	4.00	424.6
F. E. Peck	Elizabeth	Gd. Guer.	10488	4.05	424.6
C. Fleming	No. 10 Bunnie	Gd. Hol.	7791	4.46	347.0
M. Perkins	Adams	" "	10754	4.23	456.4
M. Middleton	No. 11	" "	9756	3.42	333.6
C. C. Rodgers	Jane	Gd. Guer.	7730	4.40	340.2
Ben Middleton	Sadie	Gd. Hol.	18490	3.95	729.6
Rogers & Rogers	Pansy	" "	13158	3.17	418.3
McNair & Son	Betsy	Gd. Guer.	10267	4.42	455.0
B. H. Bready	No. 15	Gd. Hol.	12951	3.61	468.6
A. S. Harrison	Miss Lou 5th	P. B. Sh.	9726	4.12	401.0
Sterling Farm—H-1 Herd	No. 10	Gd. Hol.	7642	4.40	336.2
Sterling Farm—Guer. Herd	No. 113	Gd. Guer.	7577	4.69	355.7
P. B. Crandall	Lady Lena	P. B. Hol.	14548	3.31	480.4
J. R. McMillen	Bingham DeKol No. 11	Gd. Hol.	15527	4.18	647.3
Wm. Retzer	White	" "	10926	3.60	391.6
W. I. Robey	No. 2	Gd. Jer.	6955	5.61	390.2
E. Robey	No. 12	Gd. Hol.	8827	4.38	386.9
Geo. R. Bready	Easter Lily	P. B. Hol.	11133	3.88	430.4
F. N. Mohler	Alcartra No. 2	Gd. Hol.	14769	3.51	518.3

Cows Over 400 Pounds of Butterfat

	Breed	Milk Prod.	Test	B'fat Prod.
J. R. McMILLEN				
No. 11	Gd. Hol.	15,527	4.18	647.3
No. 3	" "	17,529	3.40	595.6
No. 13	" "	13,550	3.85	523.5
No. 16	" "	13,459	3.74	501.2
No. 26	" "	10,833	4.49	486.3
No. 8	" "	11,015	4.33	475.6
No. 39	" "	13,342	3.51	466.3
No. 12	" "	12,507	3.66	458.1
No. 21	Gd. Jer.	8,278	5.10	422.3
No. 7	Gd. Hol.	8,551	4.85	414.6
No. 4	" "	11,156	3.70	413.3
No. 40	" "	10,333	4.00	412.4
P. B. CRANDALL				
Lady Lena Bugham DeKol	P.B. Hol.	14,548	3.31	480.4
Japonica Korndyke Pontiac	" "	13,348	3.37	447.9
Aaggie Ora Kimberlin	" "	12,030	3.48	417.7
Annie Belle Clothilde Abbekirk	" "	12,551	3.25	409.3
Zerma Alcartra Kohingin	" "	12,128	3.35	404.7
Grace Greenwood Netherland	" "	12,496	3.21	401.3
M. PERKINS				
Adams	Gd. Hol.	10,754	4.23	456.4
Rose	Gd. Jer.	9,479	4.81	455.7
George	Gd. Hol.	11,508	3.78	434.6
Big One	" "	11,062	3.75	415.8
Arch	" "	10,803	3.77	407.1
Pied	" "	9,476	4.26	403.3
L. C. FERGUSON				
Big Prince	Gd. Hol.	12,051	4.16	503.2
Junior	Gd. Guer.	9,753	4.62	450.3
Turner	Gd. Hol.	10,538	4.17	438.9
Stella	" "	11,794	3.58	421.8
King of Wildwood Lass	P.B. Hol.	11,533	3.57	410.3
WM. ELLMORE				
No. 13	Gd. Hol.	12,540	3.49	438.2
No. 12	" "	10,920	3.83	417.0
No. 11	" "	11,397	3.66	416.6
No. 22	" "	8,979	4.63	415.3
No. 17	" "	11,107	3.68	408.3

Cows Over 400 Pounds of Butterfat

	Breed	Milk Prod.	Test	B'fat Prod.
BEN MIDDLETON				
Sadie	Gd. Hol.	18,490	3.95	729.6
February	" "	14,708	3.36	493.3
Pool	" "	11,681	3.75	439.5
Potomac	Gd. Jer.	8,503	5.08	432.0
Flora	Gd. Hol.	11,770	3.57	421.2
F. N. MOHLER				
No. 2	Gd. Hol.	14,769	3.51	518.3
No. 23	" "	13,711	3.67	501.8
No. 17	" "	11,405	3.99	415.3
No. 8	" "	10,260	4.01	413.1
ALLEN BRADLEY				
No. 17 Rachel	Gd. Hol.	12,876	3.28	422.8
No. 19 Florence	" "	11,115	3.74	415.7
No. 2 White Rump	" "	11,226	3.61	404.4
McNAIR & SON				
Betsy	Gd. Guer.	10,267	4.42	455.0
Ebony	Gd. Hol.	9,833	4.46	438.3
Freckles	Gd. Guer.	8,594	4.70	403.3
B. H. BREADY				
No. 15	Gd. Hol.	12,951	3.61	468.6
No. 7	" "	13,470	3.46	467.0
No. 5	" "	11,317	3.80	429.1
M. E. MIDDLETON				
No. 20 White Face	Gd. Ayr.	9,076	4.43	402.0
No. 2 Sis	Gd. Hol.	11,185	3.59	400.4
R. L. HARRISON & SONS				
Belle	Gd. Hol.	10,639	4.00	424.6
F. E. PECK				
Elizabeth	Gd. Guer.	10,488	4.05	424.6
ROGERS & ROGERS				
No. 13 Pansy	Gd. Hol.	13,158	3.17	418.3
A. S. HARRISON & SON				
Miss Lou 5th	P.B. Sh.	9,726	4.12	401.0
GEO. R. BREADY				
Easter Lily Alcartra	P.B. Hol.	11,133	3.88	430.4

No. 11—GRADE HOLSTEIN
Owned by J. R. McMillian
15,527 Lbs. Milk—647.3 Lbs. B. F.

No. 3 JANE—GRADE HOLSTEIN
Owned by J. R. McMillian
17,529 Lbs. Milk—595.6 Lbs. B. F.

No. 13—GRADE HOLSTEIN
Owned by J. R. McMillian
13,550 Lbs. Milk—523.3 Lbs. B. F.

Table No. 2

Relation of Butterfat Test to Production Feed Costs and Income Above Costs of Feed

Average Test	No. of Cows	Milk Prod.	Butterfat Prod.	Total Feed Cost	Value of Product Above Feed Cost	Feed Cost Lbs. B. F.	Feed Cost 100 Lbs. Milk
3.00—3.19	7	9,331	288	107.54	129.39	.37	1.15
3.20—3.39	55	9,266	306	110.66	138.07	.36	1.19
3.40—3.59	66	9,388	328	122.08	143.81	.34	1.19
3.60—3.79	67	8,685	320	106.46	136.08	.33	1.23
3.80—3.99	63	7,992	311	101.76	132.57	.33	1.27
4.00—4.19	65	7,515	309	101.21	127.28	.33	1.35
4.20—4.39	39	7,103	304	97.94	119.73	.32	1.38
4.40—4.59	29	7,046	316	96.62	124.51	.31	1.37
4.60—4.79	28	6,656	312	97.17	121.57	.31	1.46
4.80—4.99	18	6,416	313	93.24	117.11	.30	1.45
5.00—5.49	18	5,780	302	84.24	116.88	.28	1.46
over 5.50	11	4,900	279	81.55	106.08	.29	1.66
Totals	466	7,960	312	102.56	130.56	.33	1.29

The above table arranges the full year cows into groups according to their butterfat test. It is interesting to note that the milk production in the first three groups testing from 3.00 to 3.59 remains rather constant and for each succeeding group there is steady gradual drop in production until those over 5.50% show only slightly over 50% of the milk production of the first three groups.

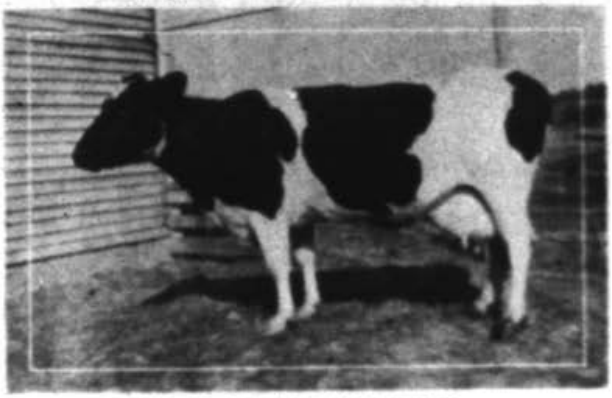
In regard to butterfat production, there is a marked increase in production in the first three groups, after which, with slight variation, there is gradual drop in production. The drop in butterfat production is nowhere near as marked as in the milk production due to the increase in test. It is significant to note that the highest testing group were also the lowest butterfat producers, and that the only two groups to fall below 300 lbs. B. F. were the lowest and highest testing group.

The total feed cost decreased as test increased, but the greatest income over feed cost is found in the groups between 3.20% and 3.99%.

The feed cost per lb. of butterfat shows a gradual trend downward while the feed cost per 100 lbs. of milk shows a marked trend upward.

No. 2—GRADE HOLSTEIN
Owned by F. N. Mohler
14769 Lbs. Milk—518.3 Lbs. B. F.

BIG PRINCE—GRADE HOLSTEIN
Owned by L. C. Ferguson
12,051 Lbs. Milk—503.2 Lbs. B. F.



No 23—GRADE HOLSTEIN
Owned by F. N. Mohler
13,711 Lbs. Milk—501.8

Table No. 3

Relation of Production to Income over Cost of Feed

Range in B. F.	No. of Cows	Average Lbs. B. F.	Average Feed Cost	Income above Feed Cost
Under 200	24	173.6	79.43	50.69
201—250	72	230.8	87.09	83.34
251—300	123	277.1	94.25	106.37
301—350	117	323.2	106.33	136.21
351—400	72	372.7	113.16	166.70
401—450	39	419.4	123.97	199.01
451—500	11	469.3	130.17	227.97
Over 500	8	565.1	145.98	293.06
Total	466	312.0	102.56	130.56

The above table arranges the full year cows into butterfat production groups. It is interesting to note the increase in the income above feed cost as the production increases. There is a corresponding and very uniform increase in income above feed costs, as production increases from group to group.

A significant fact which appears in a study of this table is that it costs over two-thirds as much to feed cows producing less than 200 lbs. of butterfat as it does to feed the cows producing over 350 lbs. and the profits in the latter group were over 3 times as great; and it costs over 50% as much to feed cows under 200 lbs. of butterfat as it does to feed cows producing over 500 lbs. and the profits in the latter group were almost six times as great. It must also be remembered that the overhead charges of care, share of barn rent, interest and insurance, etc., would be nearly identical, so that cows in the first group will show an actual loss while cows in the latter groups show substantial profit.

High Herd

The high herd for the year was the herd of 47 grade Holstein cows owned by J. R. McMillian of Herndon, Va. His herd averaged 9,974 lbs. of milk and 392.0 lbs. of butterfat. This is a very unusual high average for a herd with the number of cows that are found in Mr. McMillian's herd. The average value of his produce was $303.04, his roughage cost including pasture was $43.80, and his grain bill $82.14, making a total feed cost of $125.94, and leaving an income above feed cost of $177.10. He received a return of $2.46 for every dollar expended for feed. It cost him 32 cents to produce a pound of butterfat and $1.26 to produce 100 lbs. of milk.

Mr. McMillian also has the unusual distinction of having five out of the first ten high cows for the year.

Mr. P. B. Crandall of Herndon had the highest milk producing herd. His herd of 15 P. B. Holsteins averaged 11,096 lbs. of milk and 374.1 lbs. of butterfat.

The average cow in Va. produces about	2500 lbs. milk—100 lbs. B. F.
The average cow in the U. S. produces about	4000 lbs. milk—160 lbs. B. F.
The average cow Test Ass'n Cow in the U. S. produces	6077 lbs. milk—248 lbs. B. F.
The average Fairax Co., No. 1, Cow Test Ass'n Cow produces	7726 lbs. milk—305.4 lbs. B. F.

The production of the 666 cows in Fairfax Co., No. 1, Cow Test Ass'n this last year is equivalent to the production of 2058 of the average cows found in Virginia.

Table No. 4

Influence of Season of Freshening on Production and Profits

Season	No. of Cows	Milk Production	Butterfat Production	Total Feed Cost	Income over Feed Cost
Spring 3/15—6/14	80	7539	306	97.48	123.98
Summer 6/15—9/14	102	7785	304	102.38	131.91
Fall 9/15—12/14	146	8139	322	103.30	140.24
Winter 12/15—3/14	138	8145	311	104.85	133.15
Totals	466	7960	312	102.56	130.56

A study of this table reveals that fall freshening cows are the best producers and make more money than cows freshening during any other season of the year.

GRAINS

360 tons or about 40% of the grain fed during the year was "LARRO." Herds fed over 50% Larro averaged 964 lbs. of milk and 27.1 lbs. fat more per cow than herds fed less than 50% Larro—and showed an increase in profit of $15.82 per cow or 12.9%.

SUMMARY

109	Cows sold for beef.
64	Cows sold for Dairy purposes.
114	Cows bought.
40	Cows bought and resold during year
96	Heifers freshened.
100%	T. B. Tested.
20	Herds on Federal Accredited list.
998	Animals tested for T. B.
13	Reacters.
12	In one herd.
16	Cows died, miscellaneous causes.
43	P. B. Holstein cows.
16	P. B. Milking Shorthorns.
6	P. B. Jersey.
3	P. B. Guernsey.
1	P. B. Ayrshire
51	P. B. Heifers
305	Heifers.
100%	Purebred Sires.
49	Silos.
4	New Silos Erected.
15	Herds averaged over 300 lbs. B. F.
15	Milking Machines installed.
9	Milking Machines not in use.
14	Barns have electric lights.
16	Members have drinking cups in barn.
22	Members use steam sterilization closets.
24	Members have one or more automobiles.

Every member has a modern dairy house.

Every member uses steam sterilization.

Every member clips his cows' udders, tails and flanks,

Every member uses butter instead of oleomargarine.

Every member uses a cooler to cool milk.

5,144,670 Lbs. Total Milk Production

203,388 Lbs. Total B. F. Production

Total Value of Product		$152,341.03
Total spent for grain for dairy cows	$38,559.25	
Total Feed Cost		$ 66,882.96
Total Value of Product above Cost of Feed		$ 85,458.07

COMPARISON

Milk and Butterfat Production of Dams with Daughters

	Milk Production	B. F. Production
Dams	7598 Pounds	298.8 Pounds
Daughters	7990 Pounds	339.2 Pounds

Number of Records—22

In milk production, Daughters exceed Dams by 5.16%
In B. F. production, Daughters exceed Dams by 13. 5%
No. of times Daughter exceed Dam's record—Milk 13
No. of times Daughter exceed Dam's record—B. F. 15

The Proven Cow

"The Proven Cow's a thing of charm,
She lifts the mortgage from the farm—
She makes the farmer's life more sweet
And sets him down on Easy Street.

Where're the Proven Cow is queen
A country prosperous is seen,
And dairymen in joyful ranks
Are packing money to the banks.

Why plug along the same old way
With cows you never can make pay?
And putting up the bankrupt wail
When they refuse to fill the pail?

There is a better method now,—
The method of the Proven Cow.
This critter always earns her keep
And piles up riches while you sleep.

She pays the taxes and the rents,
And here in our good country, gents,
We have the climate, and the feed,
And all conditions that we need

So let us all be boosters now,—
And sing the praises of this cow—
Let's get our coin from the Proven bovine,
The safest money making scheme."

—Walt Mason.

Dairy Calves

Owned by Mr. P. B. Crandall

The Surest Way to Have Good Cows Is to Raise Them

Select your best cows to start with.

Cow test records determine your best cows.

Use only high class sires.

Raise and train the calves right.

Do not raise heifers from low production dams.

The average man keeps cows.

The real dairyman keeps the kind of cows that will keep him.

Let's keep better cows and produce more milk.

"The one great ruling word that should guide every dairyman in his experience with his cows is the word "comfort." Whatever destroys or lessens even the comfort of his cows robs him to a corresponding extent of his profit."—***Hoards Dairyman.***

"No man can become successful in any business without constant study of all the points that make up the business. Dairying is not exempt from this rule, the only difference is that a dairyman needs a wider course of study and more sound judgment in the application of the principles, then many professions with a more pretentious name."—***Hoards Dairyman.***

Grade Butter Cow
World's Record for 30 Days

Flora

Grade Holstein, 5 years old
Owned by Mr. Ben Middleton, Herndon, Va.
Va. Registry of Production Record

Milk	**2607.2 Pounds**
Butterfat	**118.37 Pounds**
Butter	**147.9 Pounds**

Record made after close of testing year and credited to coming year's work.

DOES COW TESTING PAY?

Does it pay to keep books in a bank or hardware store?

One question is just as wise as the other.

The day is coming when dairymen will no more think of keeping cows without keeping records than a banker will think of loaning money and trusting to his memory and luck to collect interest.

Here are five advantages of cow testing, and there are a lot more:

1. We'll take better care of the cows.

Many a man, when he began testing his cows began taking better care of them and surprised himself with how good his cows were.

2. We'll find out which cows are paying a profit.

There are thousands of herds where part of the cows are profitable cows and the rest "boarders," eating up the profit.

3. Our good cows will be worth more when we know how good they are.

A good cow will bring $50 or more if we can show her record when we want to sell her.

4. The calves will be worth more.

A wise man will give considerable more for a good calf from a good cow with a good record.

5. We can improve our herds.

When we know by actual weights and figures that we have high-producing cows, we'd be chumps if we didn't keep the heifers from those cows. ***The best way to judge the value of a young heifer or bull is by the records of its ancestors. The way to tell the breeding value of a mature cow or bull is by the records of the offspring. Without records we can't make much improvement.***

Why Milk Tests Vary

CHAS. W. TURNER, Missouri College of Agriculture

Dairymen are often puzzled at the wide variation that occurs in the per cent of fat in the milk of their cows when they are tested. Many times the fat contents varies widely from milking to milking and from day to day. The feed, the interval between milking, the condition of the weather, and the condition of the animals are often assigned as reasons for the daily variations that occur. There are other variations that occur during the lactation period and from one year to another. These variations are probably caused by the season of the year, the stage of lactation, and the advancing age of the animal.

While many of the causes of these variations are unknown, some have been studied and the variation can be predicted with reasonable certainty.

Variations Between Milkings

It has been shown in many experiments that there is a natural variation in the test between the night and morning milkings. Even when the period between milkings is equal, the evening milking will test higher than the morning milking. Richmond reports the following results from the analysis of 18,519 samples of milk. The average per cent of fat in the morning milk was 3.53 and in the evening 3.94. Where the per cent of fat is larger the variation between night and morning is generally greater. The more active metabolism in the body of the animal during the daytime is assigned as the cause of this variation by one investigator while another believes the hightest at night is nature's provision to supply the calf with more energy during the night when it is somewhat colder than during the daytime.

The Influence of the Interval Between Milking

The interval between milking has an influence on the per cent of fat in the milk. The greater the interval the lower the test of the milk and the shorter the interval the higher the test. This seems to hold true to some extent by milking often; three-time milking will give a slightly higher test than two-time a day milking and four-time a day milking a higher test than either two or three times per day. The reason for this variation is thought to be due to the fact that some of the fat is reabsorbed when the udder is full or else the pressure of the milk in the udder depresses the secretion of milk fat. This importance of milking often and regularly can thus be understood. Of course there is the added advantage of a larger milk flow with frequent milking.

Complete Milking

If part of the milk is left in the cow's udder when the milk is held up, the per cent of fat in the milk will be low, due to the fact that the last part of the milk is especially rich. At the following milkings the effect of leaving the rich milk in the udder results in a somewhat higher test. An interesting experiment was recently reported by the Missouri Station which seems to indicate that the cause of successive portions of milk gradually increasing in fat content is partially at least due to the action of gravity, the lighter fat arising to the top of the milk cistern and ducts leaving the bottom milk poorer in fat. It was found that if a cow was milked immediately after coming into the barn and successive portions of the milk were tested that the first milk averaged about 3.1%, while the later samples gradually increased to about 6.8%. If, however, a cow was allowed to stand quietly in the barn for two hours before milking the first milk from the same cow tested about 1.4 per cent and the last milk increased in richness very rapidly to as much as 11 or 12 per cent. When after standing two hours the udder was thoroughly massaged so that the milk within was thoroughly "mixed," it

was found that the difference between the first and last milk was small. This difference may explain the reason for the vigorous action on the part of the calf in nursing the dam. It may also explain why the last milk, if left in the udder one time, might affect the subsequent tests and why at another time it might not be affected as much. These and other observations to be presented later lead the writer to believe that the ways of the cow are not strange. "She does and she doesn't, and then she does neither," only because we are not keen observers of the reasons for the changes.

Influence of the Condition of the Weather

It has been shown that cold, clear weather not only stimulates the appetite of a cow and causes her to produce more milk, but the cold will also bring up the test. This has been shown very clearly in many tests. One application of the knowledge of this point lies in continuing a seven-day test if one is fortunate enough to run into a cold spell as in practically every case it will be a means of increasing the record if other conditions do not interfere.

The Effect of Exercise

A moderate amount of exercise after a period of rest will cause a decrease in the yield of milk and an increase in the per cent of fat for a time. If the exercise is continued and the milk is permanently decreased, the percentage of fat will gradually return to normal. If the exercise is severe, the cow may hold up her milk and show both a reduced flow of milk and a reduced test but later will increase in test for a time. Ill treatment will usually result similarly in a temporary reduced milk flow and reduced test if the effect on the nervous system is to cause the cow to hold up her milk. However, if the exercise or ill treatment or other similar conditions are continued, the cow gradually adapts herself to the change and returns to the normal secretion of milk.

Influence of Physical Condition

The value of having cows in good condition is so well known that it is unnecessary to say much about this point. The more soft fat the cow has at calving time the better will be her test at the start of the lactation period. This better general physical condition will also help her throughout the entire latation period. Oil meal is considered an excellent feed to produce a soft body fat that will come off quickly for a seven-day test.

It has also been shown that if a cow is an extremely poor condition at calving time, the per cent of fat will be lower for a time than the average for the year.

Influence of Feed

For many years experiments have been run to find feeds that would have an influence on the per cent of fat in milk. These experiments have not been successful in finding a feed that will have a permanent effect on the composition of the cow's milk. Several facts, nevertheless, have been discovered that explain many variations that occur in the fat content of milk. It was found at the Missouri Station that when a cow was underfed or starved for a time that the per cent of fat in the milk will increase considerably, especially if the cow is in good condition. It takes several days for this increase to take place but it will continue for some time if the underfeeding is continued and the cow is in good condition. Upon increasing the feed the test will go down below normal for a time but gradually come back to normal. The same result takes place when a cow is off feed or out of condition. The reason this effect is not apparent is due to the fact that the cow generally gets back into shape again before the effect of the under-feeding shows itself in the increased test.

It has been demonstrated in many experiments that when cows are turned out to pasture in the spring that the increase in the test that follows is due to the fact that the cows are underfed

for a time. It is practically impossible for a heavy producing cow to eat enough fresh, green pasture grass to take care of her needs after being stall fed all winter. Under-feeding is shown by the decrease in the live weight of cows upon turning to pasture. When a cow is in a very poor condition or is not giving much milk the effect is not so apparent and for that reason there is less change in the test. This might explain why cows under the same conditions might not vary in their tests the same way; in fact, one cow might go up and the other remain normal.

While there is much still to learn about the daily variations that occur in the fat content of cow's milk, it is hoped that the above will help to explain logically some of these variations. There are other variations that extend over a lactation period and from year to year which, although not quite so easily observed, are seen when a number of records are studied.

Influence of the Stage of Lactation

The fact that generally there is a tendency for the per cent of fat to rise gradually during the lactation period has been shown by a number of investigators. In a recent study of Holstein, Guernsey and Jersey records, it was found that during the first month the test is somewhat higher than it is the second month. This is probably due to the influence of the fatness of the cow. The lowest point varies with the condition of the cow but quite often occurs about the 45th day. Following this low point there is a gradual rise until the end of the lactation period. The cause of this gradual rise is thought to be due to a decrease in the flow of milk as the production of fat by the mammary gland appears to be more constant than the production of milk so that in case there is either a sudden or gradual decrease in the milk flow, the more or less uniform fat production is continued by means of a higher percentage of fat. One practical value of this information lies in the fact that the time to secure good, short time tests is the beginning of the lactation periods.

Influence of the Season of the Year

It has been shown in an extensive investigation that the season of the year is the important factor in the variation that occurs in the fat content of milk from month to month. In general it may be said that no matter when a cow freshens there will be a strong tendency for the per cent of fat to be highest during the winter months and lowest during the hot summer months. This factor is stronger than the advance of lactation. For example, if a cow freshens in the summer the per cent of fat the last months of the lactation period the following summer will be lower than it should be. On the other hand, in the case of a cow freshening in January there would be several tests the following summer lower than some of the previous months and then the test will go higher than normally due to the combined effect of the cold weather and the advance in lactation. This factor is of the greatest importance in making large, yearly records. It will be seen that by having a cow calve in the early fall the fatness of the cow will give a good test at the start. Then while the cow is giving a large flow of milk during the winter the season will influence the test favorably. The following summer when the milk flow is down the value of the high tests are not as great, and in the case of the 10 months' record the hottest summer months will be eliminated. With other conditions equal it is entirely possible to increase the record of a good cow from 25 to 100 or more pounds of fat by starting the test at the right time.

In the case of the seven-day records the best time to run them, if it is not planned to continue the cows for a yearly test, would be during the winter when it is cold, then the combined effect of the fatness of the cow, the season of the year, and the better appetite of a cow will produce a high

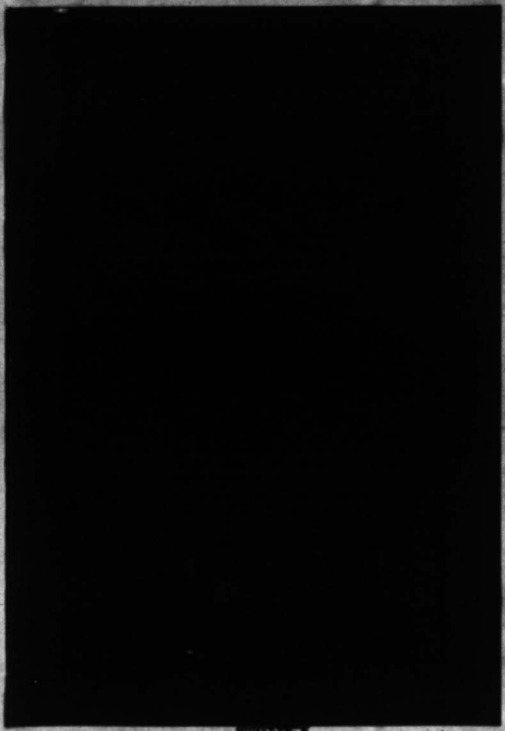
test and large flow of milk. In the spring while everything is conducive to large milk production the percentage of fat is bound to be lower than it would otherwise be, due to the season, thus resulting in a smaller record.

There are other factors in addition to the increase in per cent of fat that make it advisable to start yearly test cows in the fall rather than the spring or summer. Heat, flies, and poor pastures all have the tendency to reduce the milk flow which is difficult to get back later, while on the other hand the fall fresh cow will be stimulated to greater milk flow on pasture the following spring.

Influence of Age

The average per cent of fat for a lactation generally increases slightly for the first two lactation periods and then gradually decreases slightly as old age approaches. The change is very slight and shows only when many records are averaged together.

We wish to thank the Larrowe Milling Company of Detroit, Michigan, manufacturers of LARRO Dairy Feed for making this report possible by printing it.



E-184

One Pound of Fat a Day

FOR

Ten Months

(305 DAYS)

Test to find the "Best,"
Test to find the "Loafer."
Breed and Feed will do the rest,
And Records keep you posted.

REGISTER OF PRODUCTION

Virginia Cow Testing Associations

Virginia Agricultural and Mechanical College and Polytechnic Institute and the United States Department of Agriculture, Co-operating.
Extension Division,
John R. Hutcheson, Director.
Blacksburg, Virginia.

Distributed in furtherance of Acts of Congress of May 8 and June 30, 1914.

EXHIBIT C

Virginia Register of Production

FRANK A. BUCHANAN

Every Virginia dairy cow that is worth keeping should have a record of production, because it is only by the keeping of such records that the true worth of the cow can be known. According to the 1920 census the average cow in Virginia produced only 2,500 pounds (292 gallons) of milk in one year, with less than 100 pounds of butter fat. This fact should arouse dairymen to the need in Virginia for dairy cows of higher average production.

The Virginia Cow Testing Associations are organized for the purpose of keeping records of production on more of the dairy cows in this State. By means of these records the "boarder" and unprofitable cows can be eliminated from the herds. The average production of the herd can be increased, bringing to Virginia dairy farmers larger profits from fewer cows.

At present there are over 5,000 cows on test in Virginia Cow Testing Associations. Hundreds of these cows ought to produce a pound of fat a day, during their lactation period. Cows that can make 300 or more pounds of fat in ten months deserve recognition, because they are far above the average. When such a record is made these cows should no longer be classed with the ordinary unimproved cow, but should be in a class of their own and their record known to all the world.

The Virginia Register of Production was established in order that the records of cows making 300 pounds of fat or more in ten months will be recognized. Not only will the cows be honored by this recognition but the owners will receive the credit for this accomplishment; since it is the good feeding, breeding and management given to such cows that enable them to qualify for the Register of Production.

OBJECT

1. To give wide publicity to the records made by cows in Virginia Cow Testing Associations.
2. To secure better breeding and better feeding methods and better care for Virginia dairy cows.
3. To increase the purchase and sale of cows on the basis of yearly production, and of calves and purebred bulls on the basis of the yearly production of their dams.
4. To emphasize the necessity of judging a dairy bull according to the work of his daughters.
5. To establish recognised yearly records for purebred and grade cows when these cows would otherwise be without a record.

HOW IT WORKS

A certificate, a reduced copy of which is shown on page 5 will be issued for each cow accepted for entry upon the completion of her record. A year-book will be published and distributed in which the name, age, breed, record, etc., of each cow qualifying, will be given under the name and address of the owner. Bulls having two or more daughters from different dams in the Virginia Register of Production will be entered in the year-book without charge upon ap-

(S)

Virginia State Dairymen's Association

Cooperating with

The Virginia Polytechnic Institute---Dairy Extension Office

Register of Prodnction Number:.....

This is to certify that the cow.....

whose description appears on the reverse side of this certificate and is owned by.....

..... Address.....

has qualified for entry in the

Virginia Register of Production—Virginia Cow-Testing Associations

having produced.....pounds of milk containing.....pounds of fat during ten consecntive months (305 days) beginning.....192....., and ending.....192....., as recorded by the records of the.....

.....Cow-Testing Association, and has dropped a living calf within thirteen months since the last date of freshening.

Approved and verified by V.P.I. Dairy Extension Office

.....

Dairy Husbandman

.....

Sec'y Virginia State Dairymen's Ass'n.

Certificate issued ..... 192.....

plication of the owner. Additional publicity may be secured through the publication of these records by breed association journals and the agricultural press. A permanent record of the data for each cow entered will be kept in the Virginia Register of Production office.

HOW TO ENTER

If you are a member of a Virginia Cow Testing Association and have a cow which you believe can make a record of 300 pounds of butter fat or more during ten consecutive months (305 days) of her lactation period, get in touch at once with your tester. He will furnish you with an application form and help you to fill it out. When it is filled out, mail it to the V. P. I. Dairy Extension Office, Blacksburg, Virginia. It is best to enter your cows as soon after freshening as possible, but entry may be made any time within sixty days after the date of freshening. Keep the daily milk weights from the fourth day after freshening.

WHAT DOES IT COST?

For the first year of the Register no fee will be charged for entry. If you are not a member of the Virginia State Dairymen's Association, you may join by sending your annual dues ($1.00) to the secretary of the association at Blacksburg, Virginia.

RULES AND REGULATIONS

1. **Supervision.** The Virginia Cow Testing Association Register of Production shall be considered a part of the co-operative project of the Virginia State Dairymen's Association and the Dairy Extension

Office of the Virginia Polytechnic Institute Extension Service. The supervision and control of the Register shall be vested in these co-operating parties and their decision shall be final in all matters pertaining to the work. The work shall be done under the direction of the secretary of the Virginia State Dairymen's Association co-operating with the Dairy Extension Office of the Virginia Polytechnic Institute Extension Service. Appeals from the decisions or rulings of the Register of Production Office may be made to the co-operating parties above described.

2. **Entry a privilege.** Entry in the Register is a privilege and not a right. The Register of Production Office at its discretion may refuse to enter a cow in the Register or issue a certificate of registry provided it has evidence that fraud has been resorted to by the owner, herdsman or tester.

3. **Features of the Register.** The main features of the register will be to issue certificates for all animals that qualify, and to publish a year-book giving information concerning each animal that qualifies.

4. **Requirements for Application.** The owner of any cow (grade or purebred) may apply for entry of cows in the Register if he is a member of any regularly organized Virginia Cow Testing Association and also a member of the Virginia State Dairymen's Association, provided he continues as a member of a cow testing association after the completion of the record. If the Cow Testing Association is not reorganized, the owner will not be debarred from entry provided he has been of service in attempting to reorganize the association.

5. **Requirements for Entry.** Only cows are eligible for entry in the Register that produce as much as 300 pounds of butter

fat in ten consecutive months (305 days) of one lactation period, and from the last date of freshening.

6. **Requirement to Qualify.** In order to avoid unnecessary supervision of cows which may be entered and not prove capable of making the requirements, all cows entered which do not make as much as 30 pounds of butter fat each month for the first three months of their lactation period, will be withdrawn from the records of the Register of Production for that lactation period. Such cows cannot be entered until their next lactation period.

7. **Placing Cows on Test.** Application for entry of a cow in Virginia R. O. P. must be made to the Dairy Extension Office, V. P. I. Extension Service, Blacksburg, Virginia, on the regular form for making such applications. Applications for entry may be made at any time within sixty days after the cow freshens. The time of starting the test will be the fourth day after the date of freshening.

8. **Length of Test.** Records of production shall be based on ten consecutive months (305 days) of one lactation period, beginning with the fourth day after calving.

9. **Calving Requirement.** Before a cow is admitted in Virginia R. O. P. she must have dropped a living calf within thirteen months from the last date of freshening. This fact is to be attested by the cow tester supervising the record, and the date of birth reported on the regular monthly report.

10. **Weighing and Reporting Milk Yield During Test.** The milk of every milking of a cow on test must, during the period of the record, be recorded by the owner and reported to the Dairy Extension Office, each month, on a daily barn milk sheet form. Only the original dairy milk weights as en-

tered on the barn milk sheet will be accepted.

11. **Supervisors of the Test.** The cow testers regularly employed in the Virginia Cow Testing Associations are the supervisors of the tests, and no records will be accepted except those furnished by cow testers whose work is approved by the V. P. I. Dairy Extension Office. The supervisors of the test will be required to furnish a monthly statement of the test, weights and other information concerning the records of the cows under R. O. P. test. These monthly statements are copies of the regular association records of the tester.

12. **Privilege of Retest.** At any time during the period of the test, when there is any doubt as to the correctness of the records, the secretary of the Virginia State Dairymen's Association may send a tester to the owner's farm to conduct a check test and investigate any condition relating to the test that may be in doubt. Such a retest will be done at the expense of the Virginia State Dairymen's Association.

13. **Re-entry.** A re-entry in the register for a more creditable record may be secured in the same way as the original entry.

14. **Eligibility of Bulls.** Any purebred dairy bull having two daughters from different dams that have been entered in the Virginia Registry of Production shall be eligible for registry.

15. **Application for Registry.** All applications shall be properly recorded and preserved. For each animal admitted to entry in the Register the owner shall be supplied with a proper Certificate of Production, issued by the Virginia State Dairymen's Association and the V. P. I. Dairy Extension Office co-operating.

16. **Records Checked.** No cow will be recorded or certificate issued until all items

in the application have been checked and the monthly records checked by those in charge of the Register with the association records on file.

17. **Year-book.** A Register or year-book will be published giving the essentials of the record, together with the name and address of the owner of the animal accepted for entry.

18. **Incorrect Entry.** Any incorrect entry may be expunged from the record, the certificate revoked, and such action will be published.

19. **Two years' Record.** For cows qualifying two or more years in succession, a special class or designation will be given in the year-book and on the certificate.

RULES GOVERNING THE "BETTER BULL" CAMPAIGN

FOR 1923

$650.00...Six Hundred Fifty Dollars in Cash Prizes...$650.00

First Prize.....	$225.00
Second Prize.....	175.00
Third Prize.....	125.00
Fourth Prize.....	75.00
Fifth Prize.....	50.00

A. - $650.00 in cash; $300.00 given by the Virginia State Bankers' Association; $150.00 by the Virginia State Dairymens' Association and $200.00 to be raised by the Club Department, will be awarded in five prizes, divided as above indicated, subject to the conditions stated below, to County Agents, showing the greatest number of "scrub" bulls replaced by registered bulls in their respective places.

1. - Prizes awarded agents are to be used in their respective counties for some phase of Boys' and Girls' Agricultural Club work and exact manner in which such prizes are used for this purpose to be decided upon by the county agent and the State Club Agent.

B. - Awards will be made on the basis of the number of "scrub" bulls of breeding age replaced by registered bulls.

1. - A "scrub" bull is replaced when the "scrub" is castrated or slaughtered and an interest in a registered bull is purchased.

2. - A "scrub" bull shall be defined as a bull that is not registered or eligible to registry.

C. - No less than 25 county agents must compete in this contest before prize money is available and no county agent shall be eligible to a prize unless at least 15 "scrubs" are replaced.

D. - All entries must be made to the Extension Animal Husbandman before 1924. All replacements counted from January 1, 1923 to January 1, 1924

EXHIBIT D

RULES GOVERNING THE "BETTER BULL" CAMPAIGN

1923

E. - Any question which may arise in this contest will be referred to the "Better Sires" Committee for settlement. This committee will consist of:-

R.L. Burke, Representing Virginia State Bankers' Association

F.S. Walker, Representing the Virginia State Dairymens Ass'n.

J.P. Keen, Extension Animal Husbandman

Jno. R. Hutcheson, Director Extension Division, V.P.I.

W.R. Crockett, Representing the Virginia Beef Breeders Association

F.A. Buchanan, Extension Dairy Husbandman

The decision of this committee will be final

F. - An uncertified monthly report showing the name and address of the owner of the "scrub" bull replaced and breed of the registered bull in which an interest has been purchased, will be forwarded on the first day of each month to the Extension Animal Husbandman.

G. - A final report certified by the county agent showing the names and addresses of owners of scrub bulls which have been replaced, together with the breed, name and registry number of each registered bull in which they have purchased an interest will be forwarded to the Extension Animal Husbandman on or before January 1, 1923.

EXHIBIT D

EXHIBIT 2

E-288

Dairy and Forage Crop Campaign

RECORD CARD

Name _____

P.O. _____ r.f.d _____ Dist. _____

No. Cows in herd _____ Breed _____

No. of grades _____ No. of Pure Breds _____

1 Do you use a pure bred bull? _____ Breed _____

Are you interested in getting a pure bred bull? _____

Breed preferred _____ Would you join a bull association? _____

4 Would you join a cow-testing association? _____

3 Do you favor a county-wide T. B. Eradication plan? _____

CROPS

2 Do you grow soybeans? _____ No. of acres _____

5 Do you grow alfalfa? _____ No. of acres _____

Have your yields of clover been satisfactory? _____

Yield in tons per acre { Soybeans _____ / Alfalfa _____ / Clover _____

How many acres will you seed in 1923 { Soybeans _____ / Alfalfa _____ / Clover _____

6 Will you use certified soybean seed? _____

Will you use known origin clover and alfalfa seed? _____

7 How many acres have you limed within four years? _____

Will you lime? _____ No. tons during 1923 _____

Will you help order a carload of lime? _____

8 Have you a silo? _____ Will you build a silo during 1923? _____

EXHIBIT 7

SIXTEENTH ANNUAL REPORT

OF THE

VIRGINIA STATE DAIRYMEN'S ASSOCIATION

ABRIDGED REPORT

OF

PROCEEDINGS, ADDRESSES AND DISCUSSIONS

OF THE

SIXTEENTH ANNUAL CONVENTION

HELD AT

CHARLOTTESVILLE, VIRGINIA

MARCH 8 - 9, 1923

COMPILED

BY

FRANK A. BUCHANAN, Secretary

Mrs. B. BISHOP, Stenographic Reporter

JUNE, 1923

OFFICERS AND DIRECTORS

VIRGINIA STATE DAIRYMEN'S ASSOCIATION

1923 - 1924

OFFICERS

J. V. NICHOLS ..... *President*
Purcellville, Virginia

M. D. RHODES ..... *Vice-President*
Broadway, Virginia

F. A. BUCHANAN ..... *Secretary-Treasurer*
Blacksburg, Virginia

DIRECTORS

Name	Address	Term Expires
Dr. J. S. Andrews	Orange, Va.	1926
C. Nelson Beck	Charlottesville, Va.	1926
A. F. Howard	Charlottesville, Va.	1926
R. L. Harrison	Herndon, Va.	1926
C. L. Stall	Lynchburg, Va.	1925
F. S. Walker	Woodberry Forrest, Va.	1925
C. W. Holdaway	Blacksburg, Va.	1925
J. V. Nichols	Purcellville, Va.	1925
W. M. Cease	Richmond, Va.	1924
M. D. Rhodes	Broadway, Va.	1924
W. C. Hoover	Timberville, Va.	1924
Lee McChesney	Bristol, Va.	1924

Program

SIXTEENTH ANNUAL CONVENTION
HELD AT THE
MONTICELLO ARMORY, CHARLOTTESVILLE VA.

THURSDAY, MARCH 8, 1923

Opening Session

9:30 A. M. Invocation.

Welcome — L. D. Case, Secretary, Chamber of Commerce, Charlottesville, Va.

10:00 A. M. Response.

F. S. Walker, President, Woodberry Forest, Va.

10:30 A. M. Address.

*Governor E. Lee Trinkle, Virginia.

11:30 A. M. Address: "Co-operative Marketing of Dairy Products."

†Aaron Sapiro, New York and California.

Afternoon Session

1:30 P. M. Address: "Setting up a Farmers' Co-operative Marketing Association."

Director Jno. R. Hutcheson, V. P. I. Extension Service, Blacksburg, Va.

2:30 P. M. Address: "The Dairyman's Part in the Successful Marketing of Dairy Products."

A. A. Borland, Professor Dairy Husbandry, State College of Pennsylvania.

3:15 P. M. Address: "The Relation of Education to Agriculture."

†Dr. J. A. Burruss, President V. P. I., Blacksburg, Va.

4:00 P. M. Address: "Bovine Tuberculosis."

Dr. L. B. Ernest, U. S. Bureau of Animal Industry.

Night Session

Annual meetings and banquets of the State Dairy Breed Associations.

*Prevented from attending convention because of the meeting of an extra session of the legislature.

†Prevented from attending convention because of illness.

FRIDAY, MARCH 9, 1923

Morning Session

9:00 A. M. Business Session of the Association.
J. V. Nichols, Vice-President, presiding.
Report of the President.
Report of the Secretary-Treasurer.
The Virginia Registry of Production.

9:45 A. M. Dairy Cattle Feeding and Management.
By Virginia Dairymen, Members of Virginia Cow Testing Associations.
Leaders in the discussions:
R. L. Harrison, Fairfax County.
"How I Raise my Dairy Calves."
H. W. Gills, Henrico County.
"My Crop Rotation for my Dairy Farm and Why I Use it."

10:30 A. M. Address: "Future Dairymen and Holsteins."
C. F. Bigler, Syracuse, N. Y., National Holstein-Friesian Association.

11:30 A. M. Address: "Balancing the Dairy Ration."
W. J. Fraser, Professor of Dairy Husbandry, University of Illinois.

Afternoon Session

1:30 P. M. Address: "Leading Families of the Important Dairy Breeds."
Professor R. E. Hunt, Professor of Animal Husbandry, V. P. I., Blacksburg, Va.

2:15 P. M. Address: "Valuable Discoveries Made by Cow Testing Associations."
J. C. McDowell, Dairy Husbandman, Dairy Division, Washington, D. C.

3:00 P. M. Address: "Why the Dairymen of Virginia Should Observe the Rules and Regulations of the State Live Stock Sanitary Board and the U. S. Bureau of Animal Industry."
Dr. J. G. Ferneyhough, State Veterinarian.

3:30 P. M. Address: "The Outlook of the Dairy Industry."
Impressions of a college student in Dairying. By a college student sent from V. P. I. Dairy Club, V. P. I., Blacksburg, Va.

4:00 P. M. Announcement of Committees and Contest Awards.
Adjournment of the Convention.

TRANSACTIONS

WITH ACCOMPANYING PAPERS AND DISCUSSIONS (ABRIDGED)
OF THE

VIRGINIA STATE DAIRYMEN'S ASSOCIATION

AT THEIR SIXTEENTH ANNUAL CONVENTION
HELD AT CHARLOTTESVILLE, VIRGINIA, MARCH 8-9, 1923

INVOCATION

DR. H. W. BATTLE.

Our Father in Heaven, we thank Thee that according to the revelation of Thy word, Thou art interested in all that concerns our well being. We rejoice in all the blessings of life. We render to Thee the expression of our gratitude for this beautiful day with its opportunities, for these men who have come from various sections of the state in the interest of that which promotes human comfort, health and well being, and we beg Thy blessing upon each one, and upon their families wherever they may dwell.

We pray that the session of this convention may result in great good, that they may devise plans that will enable them more and more effectively to accomplish the laudable things that they have in mind.

Bless, we pray Thee, our state. We thank Thee for Virginia. We thank Thee for a glorious history, for all its natural advantages, for the confidence we have in her future, and that confidence, our Father, is largely sustained by the type of men we have in this convention.

Now, overrule all their efforts, and may the convention accomplish Thy will and redound to the benefit of the entire state, and to the advantage of those who are here assembled, we beg in the Redeemer's name. Amen.

WELCOME

Mr. President, Gentlemen of the Convention:

Back in the old days in English history, you probably remember that woman was a power in politics. In fact, in those days she was spoken of as the power behind the throne. One day Charles Fox, a contemporary of Pitt, the friend of the American colonists, was calling on one of these ladies. They entered into a political discussion. The woman finally lost her temper. There was an open book lying on the table. She banged it shut with the words: "Mr. Fox, I don't care for you three skips of a louse."

Mr. Fox opened the book, and on the fly leaf wrote these words:

"A woman has told me,
And that in her own house,
That she cares for me not three skips of a louse,
But I'll forgive her,
For oft has been said,
That woman will talk of what runs through her head."

Only one thing runs through my head when standing before a gathering such as this, and that is that we all belong to one community. I am not

thinking of anything as small as the metropolis known as Charlottesville. I am thinking of the state and nation. We all belong to one community, and, thank God, we are at last learning that we can best serve our own individual interests and promote our own personal welfare when we contribute something of our time, strength, money, our prayers, tears, and our very lives, if need be, to make the community great in all that makes for the comfort, convenience, progress, happiness, and security of the people.

It has been forced upon us in the last few years that we are largely, as Dr. Battle and other preachers have been trying to tell us, and we are just commencing to see it, that we are largely members one of another. No man lives alone no man dies alone. Not only in reference to things of the higher life is this true, but with reference also to our material welfare. We best serve ourselves when we serve the whole people.

I am thankful that the old dividing line between county and city is passing away, and that we are commencing to see that the city and county are not two, but one, each dependent upon the other, and each should be interested in helping solve the problems of the other.

Our mayor is the kind of man who would have been here today but for illness. He would not have missed an occasion of this kind for any other reason, but would be here to say his own word. I am speaking on behalf of our mayor, of the citizens of Charlottesville, of our civic organizations, of all our people, when I tell you we have a particular interest in the dairymen, and that we are glad to go more than half way to co-operate with them.

It is with joy that we welcome you to Charlottesville. We hope you will come again. If there is anything you want, don't hesitate, but tell us what that thing is.

FIRST SESSION

SUBJECT: COOPERATIVE MARKETING

"SETTING UP A FARMERS' COOPERATIVE MARKETING ASSOCIATION"

JOHN R. HUTCHESON, Director of Extension

Successful Associations in Virginia

Few people realize the great strides that have been made in the co-operative marketing of farm products in Virginia during the past three years. Prior to 1920 there was only one large co-operative marketing association of farmers in the state. This was the Eastern Shore Produce Exchange, with a membership of about 5,000 farmers. In the last three years Virginia farmers have organized the following marketing associations: The Peanut Growers' Association, with 2,500 Virginia members; the Tobacco Growers' Association, with 35,000 members in Virginia; the Southwest Virginia Cooperative Exchange, with a membership of about 1,000; the Maryland-Virginia Milk Producers' Association, the Valley of Virginia Milk Producers' Association, the Richmond Milk Producers' Association, and one or two other milk marketing associations, with a total membership of about 2,000 dairymen; the Virginia Sheep and Wool Growers' Association, and the live stock shipping associations, with a combined membership of about 2,000. The membership in these associations, together with that of the Eastern Shore Produce Exchange, totals approximately 50,000 farmers. This means that between 20% and 25% of the farmers in Virginia are now selling some of their products cooperatively.

The Eastern Shore Produce Exchange, with a membership of more than 5,000, has been in operation for over twenty years and has demonstrated clearly that Virginia farmers can co-operate successfully in selling their products. Year in and year out, the farmers on the Eastern Shore make more per acre than any other farmers in the state. In one year this association did over $19,000,000 worth of business for the farmers of Accomac and Northampton counties. The association, of course, has some bad years, but the very fact that the farmers are organized helps them to get through these bad years in much better shape than the unorganized truck growers.

The Peanut Growers' Association was organized about two years ago and has had some very disastrous experience on account of poor management. It was the first large commodity co-operative association organized in the east on the California plan, and it was to have been expected that many mistakes would be made. Cooperative marketing as practiced in California and Denmark was something entirely new to the peanut growers. Both the farmers and the members of the board of directors have had to learn what cooperative marketing is. In some cases they have paid a high price for this experience, but they are rapidly learning, and the association is said to be in better shape at present than it has at any time since its organization. It has done much to stabilize the price of peanuts this year. Plans are being perfected to put on a national campaign of advertising for the peanut. If this campaign is carried out it will undoubtedly increase consumption and bring a better price for the product.

The organization of the tobacco growers was begun about two years ago. The association opened for business last fall with approximately 35,000 Virginia members signed up for a period of five years. This association has made a splendid record thus far. It has handled over 50% of the bright tobacco produced in Virginia during the past year and will very probably handle more than 50% of the dark tobacco. It has already meant thousands of dollars to Virginia farmers. To show just what has been accomplished the following figures are given: In 1921 Virginia farmers produced about 67,000,000 pounds of bright tobacco which sold at approximately 20 cents a pound. In 1922, the first year of operation of the association, Virginia farmers produced 104,000,000 pounds of bright tobacco which averaged approximately 25 cents per pound. It is true that the 1921 crop was not of as good quality as the 1922 crop, but this alone would not account for the great difference in price. A British trade journal recently made the statement that co-operative associations had increased the price of tobacco in the United States practically 50%.

It is, of course, recognized that the Tobacco Growers' Association is now in its infancy and that it has many hard battles to fight, but this association has demonstrated that Virginia farmers can and will cooperate on a large scale in selling their products. It has also demonstrated that such associations can be financed, that the contract which the members sign can be enforced, and that the large majority of the members will remain loyal. The association does not expect to set any arbitrary price on tobacco, but it does expect to merchandise the tobacco and eventually stabilize the price. This will not only help the farmers but also merchants, bankers, and all other lines of business.

The Southwest Virginia Cooperative Exchange was organized in 1921 and handled during that year 402 cars of cabbage, potatoes and rutabagas. An average price of $2.17 was received for cabbage. In 1922 the membership was increased and the association handled 609 cars with an average price for cabbage of .799 cents per hundred pounds. In spite of the fact of this great drop in price the members have remained loyal to the association and plans are now being made for handling the 1923 crop, and only 7 applications have been made by members for withdrawal. The cause of the great drop in price in 1922 was an over-production of cabbage. In spite of this over-production the members of the association received a higher price than the growers outside of the association.

The milk associations have all been going through a period of reorganization during the past year. They have done splendid work in taking care of the seasonal surpluses and in getting their members a better price for their product. Most of them started out as bargaining associations but have been reorganized under long-time, binding contracts. The Sheep and Wool Growers' Association has had two years of successful operation and is now being reorganized on a statewide basis with a larger membership.

The livestock shipping associations are organized by counties and most of them did splendid work during the past year. The Montgomery, Pulaski and Rockbridge county associations saved their members thousands of dollars.

At the present time the apple-growers and poultry raisers of Virginia are working out plans for statewide co-operative marketing associations. They

will probably be doing business within the next eighteen months. This shows that Virginia farmers believe in co-operative marketing. They of course realize that they are going to make mistakes and that it is going to take them a long time to learn new methods of handling their business, but the majority of them are convinced that it is only through some such associations that they can hope to compete successfully with the other lines of business. They are not organizing these associations with the idea of hurting any other class of people. They are not trying to form monopolies in food products. They are simply trying to protect their own industry, and in so doing they should receive the encouragement of every other class of citizens, for in stabilizing the price of farm products they will necessarily help every other line of business.

Setting Up a Co-operative Association

The dairy business in Virginia has developed to the point where the whole milk market is about supplied. The seasonal surpluses are becoming larger and larger. The thinking dairyman realizes that the future developement of the industry in this state must be along manufacturing lines. But if a system of co-operation is not worked out between the whole milk producer and the producer for creameries and cheese factories there cannot be the best development. This means *co-operative marketing* for Virginia dairymen. Realizing this, I am going to make the following suggestions in regard to setting up and operating co-operative associations:

1. The first step for a group of farmers to take if they think that they want to set up a co-operative marketing association is to make a thorough survey of the commodity and the territory which they want to organize and see if there is a real need for the organization of this commodity in this territory. Considerable assistance in making such a survey can be secured from the Extension Division of the State Agricultural College and from the Marketing Division of the State Department of Agriculture. If the results of such a survey show that the average producer over the territory is making a fair profit, year in and year out, and that the cost of distribution is not too high, then no co-operative association of farmers is needed and it will be very difficult to get one organized, for experience has shown that there must be a real necessity before farmers will stick together and co-operate.

2. If the survey shows that there is real need for the co-operative marketing association, a small group composed of the leading farmers from each community or county should be called together and the matter fully discussed. A committee should be appointed from this group of leaders for the purpose of working out a marketing agreement, a contract, and other plans. This committee should get in touch with representatives of the agricultural college and of the State Department of Agriculture and get these representatives to put them in touch with similar successful organizations throughout the United States. The committee should also secure the most accurate statistical data possible in regard to the production, warehousing, financing, distributing, storing, and selling of the commodity which they want to organize. Members of the committee should visit successful co-operatives and get first-hand information as to the operation of such associations. In addition, the committee should get accurate information from every other source possible. It

should discuss the matter with the leading bankers and business men in the territory, and should have associated with it competent legal authority to help work out the marketing contract. With such information and assistance, the committee can hope to work out a plan which, though not fool proof, can be made to work successfully.

Organization Committee

3. After the plan has been fully worked out it should be presented to a meeting composed of the leading growers in the territory, representatives from each of the leading farm organizations in the state, a representative of the State Bankers' Association, and the leading bankers and business men in the territory. The need and the purpose of the organization should be presented by a clear thinker and a good talker. Time should be given for a thorough discussion and a thorough explanation of all points involved in the plan. After the whole plan has been explained the endorsement of the body should be requested. The whole-hearted endorsement of such a group is of inestimable value.

After the plan has been endorsed by the leading farmers and business men of the territory, an organization committee should be appointed and an organization director elected. The organization director should be a man of the highest integrity, a man who knows how to handle other men, and a man who enjoys the confidence of a large majority of the farmers in the territory. Such a man is hard to find, but he is absolutely indispensable to the association if it is to succeed. The organization director will have to be given a certain amount of latitude in the early stages of the work and will have to have an organization committee that will meet. Immediately after the director is appointed he should get in touch with the state agricultural college, the State Division of Markets, the State Bankers' Association, the State Farmers' Union, the State Farm Bureau, and all other state or district organizations working with farmers, and sell the idea which he has in mind to these organizations and get their support. It is hard enough for farmers to fight the common enemy without having to fight among themselves.

5. Plans for financing, soliciting membership, and working the whole territory should be definitely worked out before organization work is started. A publicity department should be established at once in order to keep the farmers and the business public advised as to the purposes and plans of the organization. It is very necessary that the business public get the right conception first-hand, as a good word from one outside of the organization is better than a dozen from a paid solicitor. All publicity should be absolutely truthful. Exaggeration should not be indulged in. All the cards should be on the table, face up, all the time.

6. Great care should be exercised in hiring solicitors. Only men of high type who understand and believe in co-operative marketing and who will tell the truth and play the game square at all times should be employed for this work. More harm has been done to co-operative organizations by untruths or half truths told by uninformed solicitors than perhaps in any other way. The county farm demonstration agents and extension workers in the territory should be kept fully informed as to the plans of the organization committee and should be asked to assist in calling meetings and explaining the plan of

the organization to the farmers. These agents can be of great assistance to the solicitors. There should be frequent contact betweep the organization director and the solicitors in the field.

7. As soon as possible the director of organization should call a meeting to which is invited a representative from each country bank and from each newspaper in the entire district and a whole day should be spent in receiving suggestions from this group and selling the plan to them. If this is rightly handled as much can be done by this group as all the field men that the organization can hire. The organization director should explain to this group and all other business men that the plan is constructive and not destructive; that it is for the building up of each community rather than for the destruction of any man's business; that it is only trying to cut out waste and speculation; and that it is for the greatest good of the greatest number.

8. Operations should not be started until at least 50% of the commodity in the territory is under contract, and it is much better to have 75%.

The Permanent Orgaization

9. After the organization is completed, careful plans must be made for the election of directors. The election should be absolutely fair and the organization committee should see that the members are fully informed as to the type of directors necessary for the operation of the association. The Extension Division and other educational institutions can be of great assistance in educating the members as to the necessity of a high type of directors. The board of directors, as far as possible, should be composed of business men who are farmers and understand the farmer's viewpoint.

10. In organizing for business the board of directors should see that a department of field service is immediately appointed for the purpose of keeping up the proper contact between the organization, the growers, and the general business public. No farmer can be expected to be loyal to his organization unless he is fully informed as to its operations. A complete plan of word of mouth communication should be worked out through the organization of local units, county units, and large organizations, district units. Farmers must be kept advised of actions taken by their board of directors at its monthly meetings if the board expects the solid backing of a loyal set of men. The whole truth and nothing but the truth must be given the farmer-members at all times. An officer in the association who believes in keeping information from the grower should be gotten rid of immediately. Never promise farmers more than can be delivered. Surprise them by exceedinng promises rather than falling short of them.

The Board of Directors

11. Usually members of the board of directors should not be officers in the association, nor should they be allowed to employ their relatives as officers of the organization. The directors should receive a per diem for salary and expenses when they are actually at work. They should be men who are willing to sacrifice for the association. No man who is a director for what he can get out of the job has any right in any farmers' cooperative marketing association.

No matter how much discussion and disagreement there may be in a meeting of the board of directors, the directors must be big enough to go from

such meetings united on a general policy and all work to put this policy over. If there are any of the directors who are generally antagonistic to the well working of the association they should, in the interests of harmony, step out of office and be big enough to work in the ranks.

12. The directors must keep constantly in mind that their efforts are to benefit members, and if the organization is not functioning in this way something is wrong. They should also keep in mind the welfare of the general public. Render a real service to the public and the existence of the co-operative will be justified.

13. No person should be a director or an officer in a co-operative marketing association who is in any way connected with any speculative business that comes in competition with the business of the association which he represents, nor should any person be an officer or a director in such an association unless he thoroughly believes in the principles of co-operative marketing and is willing to sign one of the contracts of the association. Every director should be required to make a detailed study of the contract being used by his association and to thoroughly familiarize himself with all of its operations. Every director must believe that the principle of co-operative marketing of farm products is economically sound and morally right.

14. Any person who accepts a position as a director in a co-operative marketing association must be willing to give the association sufficient time and study to see that it is operated along sound business lines. In other words, the board of directors must *direct* and the executive committee must see that business is *executed*. The interests of too many people are involved for anyone to carelessly accept a position as director in a co-operative marketing association. Ignorance of what is going on is certainly no excuse for a member of the board of directors. Apologies fill no pocket books and it is usually too late to "lock the barn door after the horse is stolen."

DISCUSSION OF COOPERATIVE MARKETING

MR. FRED DRIVER,
General Manager, Valley of Virginia Milk Producers' Association,
Harrisonburg, Va.

Mr. Chairman, Ladies and Gentlemen:

I don't know anyone who knows less about it than I do. The more I think of it, the less I feel that I know. There are a few things that I would like to just go back on in Mr. Hutcheson's talk. It was a splendid talk that he made, and I hope every one listened carefully.

One thing about the market stabilized. The whole milk market, the condensed milk market and cream market, and the butter and cheese market will eventually stabilize themselves so that the man most convenient to these markets will supply them. One market cannot be so far above the other that it will stimulate the whole milk market. They are bound to stabilize. The point that he made, and is, that we must look forward to manufacturing problems. They will in that way work themselves out. The point that he stressed is that every man who is a member of the co-operative marketing organiza-

tion must recognize the fact that it is his organization, and think of it as such. We'll let the other fellow do it. Let the directors do it. Until they begin to find something to kick about. One of the things we must get before the members of all our organizations is to recognize that they are a part of it and an active part. Recognize themselves as such.

One thing that will prevent the organizations from functioning—to sum it up in one word—is selfishness. If you look upon an organization with the idea that that thing is only to help you and forget your neighbor, you don't know a thing about the meaning of the word co-operation. When you begin to think that some other fellow is getting all the benefits and you are getting none, you are not recognizing what it means to co-operate. Just a few things like that, because I know there are many who are not able to treat this proposition as it should be treated.

In 1910, when we were getting our co-operative creamery started in our section in the Valley, I got the idea. That idea has stuck to me ever since. If we can get our people to really get into the spirit of co-operation, it is going to be one of the greatest things that can ever be put over.

There is another thing that Mr. Hutcheson touched upon—our farmers in the valley are fairly prosperous, in fact they are real prosperous. They get along, are admirably situated, hard workers, and they accumulate, and I have wondered if they really feel the need of a co-operative system as they should. When you get right down to the necessity of it, people are going to co-operate better. I think that is going to be, or possibly is, a little hindrance. When we get in a position to really need the other fellow's help we will look at it differently. A great many men say "I can market my things and sell them," and he can, but think of the smaller fellow who can't and see how it works out.

Mr. Hutcheson spoke of it probably taking five years to establish a real co-operative system. It is certainly going to take longer than a year. No man can work out plans for as big a proposition as this and put them over, because there are many things that enter into it and so many things to be thought of and the plans must be laid. Some time men will think we can do this thing and make a little money and it's often the case of holding the 25 cents before your eyes and loosing the sight of the dollar behind it. So many of those things enter in.

I, personally, have greatly benefited by what I have heard, and I want to say to you men frankly that I expect to get very much more out of this than I am able to give to you.

I appreciate your attention.

Questions

MR. WALKER: May I ask this question: How do you think you could get a better price for butter through your co-operative organization, or is it possible?

ANSWER: If by an organization you have control of more products you can grade closer. Another reason is that you have a large quantity of products to offer and you can reach a certain class of trade that you can't reach when you have a small quantity.

MR. WALKER: What about the imported butter; how can you compete with it?

ANSWER: The grade I am familiar with is not as good as the imported butter. That brings out quite a proposition. We have to admit that the Danes can make better butter than we already make. I don't know of a place in Virginia that will grade right up with the Danish butter.

MR. HUTCHESON: The Danes are the greatest co-operative people we have. That is a fact. They needed it.

MR. WALKER: About giving and taking of co-operation. We always expect to take before we give. We want the kind that give before they take. That's a good slogan: "As you deliver so shall you receive." You surely have to deliver before you receive.

MR. MILLER RHODES,
President of the Valley of Virginia Milk Producers' Association,
Harrisonburg, Va.

Mr. Chairman, Ladies and Gentlemen:

This is something rather unusual to be called on to face an audience, and say something. In fact it is almost my first attempt. I have really nothing of particular interest, but some of our experiences in co-operative milk association which we have started with the help and advice of the Extension Division of the state here in Harrisonburg, we feel are big problems before us.

We are struggling along as best we can to try to put across a co-operative marketing association. We have had our troubles and made our mistakes. Some of the biggest problems that we have is this problem of producing economically. Our farmers are fairly prosperous and it's hard to get them down to the idea that they must try and produce economically. Get more money for what you are selling by selling for higher prices. Get a larger profit by producing more economically.

Get everyone interested in the association. Do not take for granted everything is going along well. Some seem to think, or I don't believe realize the enormous task to handle the co-operative association to the best advantage.

I don't know that I have anything further to say. I should be glad to hear from someone who might be able to tell us how to handle some of our problems. We feel, however, that everything is going along as well as can be expected and that we are really making growth just as rapidly as we possibly can.

WHAT THE COOPERATIVE DAIRY ASSOCIATIONS HAVE GAINED FROM LEGISLATION

MR. DELOS JAMES,
Bureau of Agricultural Economics, U. S. Department of Agriculture

Mr. President, Members of the Dairymen's Association and Friends:

It won't take long to tell what has been accomplished in new legislation because while some laws have been put through—not only Federal laws but State laws—apparently giving greater power to farmers by which they can organize for the co-operative marketing of their products, yet in those new laws there is very little more granted them than they previously had in old laws.

Further, we found that one per cent of this large number of diseased cattle showed typical lesions of the disease in other obscure parts of the body, such as the bone, minute and infrequently infected lymph glands, and organs not commonly found diseased. In fact, about 60 different varieties of lesions have been shown to exist. After considering this, remember that many autopsies are performed under unfavorable conditions, in poorly lighted butcher houses and small abattoirs, and under conditions requiring speed, which is not conducive to careful work intended to demonstrate small centers of infection in reacting cattle.

Need for Faith in the Test

I believe that the average livevstock owner, before placing his herd under inspection will have to agree to say to himself, "I have studied this problem, I have discussed it with those who have had experience in it and I have made up my mind that I am going to establish a tuberculosis-free herd and abide by the findings of the tuberculin test." If you have not this faith in the test, I say to you gentlemen that I would not have my herd tested. Keep it out of the game until you are ready to agree that you are going to offer the cooperating forces the assistance necessary to accomplish the purpose for which you sign the agreement.

Mistakes in diagnosing results of the test may occasionally occur, as even trained and experienced men who are detailed to this work are only human, and consequently liable to make an error. However, the cooperating authorities are trying to send to you men who have studied the disease and who realize that the principal mistake which can be made lies in leaving tuberculous cattle in the herd, and not in taking out possibly one or two in many hundreds which might be termed healthy animals.

When the officials, the livestock owners, and the veterinarians who are responsible to you for the health of your cattle, realize this and have this general understanding, there will be fewer errors to account for. This is the kind of assistance it is desired to offer you and the kind which we desire that you accept.

FUTURE DAIRYMEN AND HOLSTEINS

C. F. BIGLER, *President*
New York Holstein-Friesian Association,
Syracuse, N. Y.

My Fellow Dairymen:

I say "Fellow Dairymen" because that is my business. I am a farmer, a breeder of Holstein cattle and besides being president of the New York Holstein-Friesian Association, am director of our State Breeders' Association and State Dairymen's Association.

We feel we are working along the lines of greatest intensified dairying, a business which averages 22% of the value of all farm products in the United States. When I received the invitation from Mr. Walker and Mr. Buchanan to come down and speak to you at this meeting, I sensed a great deal of pleasure and thought what a good time I was going to have. I made preparations,

The Area Plan

In the limited time left me, there are just two points which I will discuss further. The first of these is what is going to be your attitude, individually, and as an association, towards the work in your state? It is true that you have done good work and will undoubtedly continue along those lines. However, the progress here, as in many other states, is comparitively slow, and it is your problem as to whether or not it will progress more rapidly than in the past. I am glad to note that the area plan, under which the greatest progress, at the lowest cost can be made, has been taken up in Loudoun County. This is a big step forward and I know that when the livestock owners of Loudoun go into the work of testing every head of cattle in that county, that they will become so vitally interested that the movement will extend to townships and other units of territory.

Many of the states are now confining their activities to the area plan. For instance, the State of Michigan has inaugurated a five year campaign to test all of the cattle in that state. This plan, formulated by the livestock breeders, proposes a $500,000.00 annual appropriation, $400,000.00 of which is to be paid back annually to the farmers in the form of indemnity for diseased cattle. Michigan has, at the present time, 33 counties which have appropriated $175,000.00 to cooperate with the bureau and state forces in the work. These figures show how rapidly the area movement progresses, once it is put into operation.

No-Visible-Lesion Cases

The second of the points which I want, and have been asked, to discuss before closing, refers to co-called no visible lesion cases in reactors to tuberculin. I know that this interests every herd owner who has had the experience of having his cattle tested, finding reactors, and receiving a report indicating that one or more of the condemned cattle, on slaughter, failed to show visible evidence of the disease. I can appreciate that if one has not thought this problem over very carefully they may receive a wrong impression of the value and accuracy of the tuberculin test.

In studying reasons why a certain percentage of such cases should be reported, there are a number of things to be taken into consideration which would convince one that they should expect to find a certain number of them. The very nature of the disease itself is such as to make it almost necessary. The disease is caused by an organism, only discernible under a high power microscope, and once gaining entrance into the animal body, disease centers may be started which will be found to exist in all stages, from the earliest infection, soon after it enters the body, up to the cases which are so bad as to be termed "generalized tuberculosis."

Then again, you must consider the size of the animal which is being examined upon slaughter. Normally, if the disease has progressed far enough, we find lesions of various sizes in certain glands and organisms. However, the tubercle bacilli is one which is apparently not difficult to please regarding its home surroundings, for carefully compiled statistics reveal the fact that three per cent of the approximately 95,000 reacting cattle slaughtered during the calendar year 1922, showed lesions in the skin and in no other part of the animal body, the skin never before having been considered a favorable seat for the lodgment of the tubercle bacilli.

must be of benefit, otherwise so many would not list their herds for official tests. The records of the bureau show that in addition to those tested there was, on April 30, 1923, 66,487 herds waiting to be tested. This does not include several hundred county units which, by reason of lack of funds, have not adopted the area plan of work which has become the predominating plan of tuberculosis eradication. I am happy to say that at the present time there are over 70 counties in the United States that have completed one test of all the cattle in those areas, and that approximately 150 are engaged in the work.

Reason for "T B" Eradication

There are two principal reasons why herd owners should eradicate this disease from their livestock. Mr. Borland spoke of one—that is a purely economic one. A real producing herd must be a healthy herd. However, there is still another economic reason for the establishment of tuberculosis-free herds and that pertains to the sale of surplus cattle, either purebreds or high class grades. There are many areas which have a large surplus of such saleable cattle, but before they can be sold in this day and age, the average buyer asks the question, "What is the health status of your herd?"

This is particularly true when buyers of cattle, who are located in a state practically free from the disease, remember their own or other persons experiences in purchasing cattle from other states. Some of these experiences have, in the past, been of a disastrous nature because, after additions were made in these practically clean herds, it was found that not only the purchased cattle but others of the herd were found to be infected. It was almost universally the case, in tracing the sources of infection in these herds, to find that it came in through one or more cows purchased from infected territory. There is a real reason for inquiry relative to the health of any herd from which you intend puchasing cattle. The buyers to the south of you are going to your north to buy their herd additions, either because you have not enough of the class of cattle they desire to purchase or because you are not properly functioning as an organization by letting these prospective purchasers know that you have cattle which may be of the type they desire. I would, therefore, suggest that your organization might find it well worth while to make it a part of your policy to form not only a healthy livestock industry, but also a better industry which will produce surplus stock of a saleable nature.

There is a second reason why you should eradicate tuberculosis from your livestock and that relates to the question of public health. The best medical authorities of this and foreign nations state that bovine tuberculosis is a transmissible disease, and especially so to children. Without question, proper pasteurization of milk is a protection against transmission. However proper pasteurization can only be effected when supervision is maintained over the process.

Census statistics show that approximately 50 per cent of our entire population live in the rural districts where the milk and milk products are produced and where ordinances for the protection of milk supplies are not practicable. I noted a day or two ago a statement made by Senator-elect Copeland, of New York, in which he said that the deaths of youngsters in the country districts were about twice that of the rate in New York City. Therefore, not only as an economic problem, but for the humanitarian reason of protecting the public health, tuberculosis of livestock should be eradicated.

Your interest in the problem of tuberculosis eradication work is evidenced by the fact that you have found a place upon your crowded program to discuss this work, despite the many other important subjects. I have been much gratified at this and especially so by the strong recommendations in connection with tuberculosis work made by your president this morning, and the stress laid upon it by the preceding speaker, Mr. Borland.

History of the Movement

Perhaps it would be well for me to take just a minute and review what this movement really entails upon those who participate in it. The thought that is behind the campaign should be emphasized. I am going to bring out this point in this way. I have heard a number of dairymen say that the federal or state authorities are eradicating tuberculosis from their herds. This is not true in any particular case. Your individual herd may be under the supervision of these authorities for that purpose. They, however, can not eradicate tuberculosis from your or any other herd. That problem is your own, and this statement brings it right home to you as an organization.

As directors of a livestock sanitary project, we can do no more than assist in the tuberculin testing of the herds and the suggesting of proper methods in the establishment of tuberculosis-free herds. Our veterinary inspectors can be detailed to test your herds for you and the services they render will be the very best that men especially trained in their particular line of endeaver can offer. However, when they leave your farm for a period of from three to 12 months it is your problem to carry out the suggestions and instructions which have been given you. Whole-hearted compliance with these ideals will result in putting your herd upon a healthy foundation, a foundation which, by the way, will insure the maintenance of production records which were so forcibly brought ont by Mr. Borland.

Just a word as to the origin of the tuberculosis work. Tuberculin has been used for many years in practically every state in the union. Results of early work indicated that tuberculosis could be eradicated not only from an individual herd, but from groups of herds, and from entire areas such as counties or larger units of territory. All the early work, which might possibly be called experimental, indicated that this was an entirely feasible movement, which could be accomplished provided the full cooperation of the livestock owners themselves was offered, and only under those conditions. I am glad to say here that the Virginia dairymen were among the early ones to assist in establishing these facts.

The co-operative tuberculosis eradication work, based upon the principles just enumerated, was organized in 1917, when, within the Bureau of Animal Industry, a division was founded to actively inaugurate the present control and eventual eradication of the disease. The early work was, of course, limited in amount. The bureau publishes each month a report showing the testing done in all the states during the preceding 30 day period.

The first of these summaries, issued in October, 1917, showed approximately 4,000 head of cattle tested under the plan. These figures have grown tremendously, as will be seen when I state that during the month of April, 1923, a total of 329,401 cattle were tested. This indicates that the plan has met with the approval of the ones principally interested, the cattle owners, and that it

learned you have a number in the state. If none exist in your community you ought to take steps to form a local unit. Only by organized effort will you ever succeed in getting a price for your products commensurate with the cost of production.

Some dairymen are so short sighted that for a cent or two extra they will desert the producers' organization and sell their products independently. They do this realizing at the same time that it is the organization that is maintaining the price of dairy products. These fellows ride along on the band wagon, but refuse to pay their legitimate share of the expense for the common good.

We have three large producers' organizations operating in Pennsylvania. The Dairymen's League in the northern part; The Interstate Milk Producers' Organization in the Philadelphia district; and the Dairymen's Co-operative Sales Company in the Pittsburgh district. Each of these organizations are doing an excellent work in securing for their members a fair price for dairy products.

At Pittsburgh representatives of the producers, the dealers and the consumers meet and settle the price of milk for the ensuing months. This is real co-operation and is working out pleasantly for all concerned.

There are also a number of farmers' co-operative milk plants in smaller cities. These are run somewhat similarly to a co-operative creamery. The farmers bring their milk to the central plant where it is pasteurized, bottled and delivered; the excess being made into manufactured products. These have been fairly successful in providing a good market for the dairymen in the community.

To summarize briefly, the farmer's part in the successful marketing of dairy products is:

1. To produce these products as economically as possible, by culling out low producing cows on the basis of yearly production as determined by cow testing associations.
2. By using a purebred sire of high producing ancestry to improve his herd, obtained most economically through a co-operative bull association.
3. By gradually working into a purebred herd of cows for production.
4. To produce products of high sanitary quality, that will command a correspondingly high price and increase the demand for dairy products.
5. To stand by the producers' organizations that are endeavoring to market his products to the best advantage.

TUBERCULOSIS ERADICATION AND ITS IMPORTANCE

DR. L. B. ERNEST,

Bureau of Animal Industry, U. S. Department of Agriculture,
Washington, D. C.

It gives me great pleasure to appear before this representative audience of Virginia dairymen. I have had a wonderfully interesting morning, listening to the addresses which have been presented. I have especially enjoyed the talk that has just been completed. Many helpful suggestions have been made and a number of references made to disease control work in cattle.

Better Quality of Dairy Products

The dairyman has a large responsibility in producing products of high sanitary quality. Virginia is a great farm butter state ranking twelfth in the union with a yearly farm butter production of 25,476,621 pounds. I am informed that you have entered in the farm butter contest 175 packages of butter. Only one sample scored as high as 92. The scores ranged from 92 to 84, the majority of the entries scoring less than 89. Do you know that the difference in price at the principal markets between butter scoring 92 and 89 is usually 7 to 9 cents. At this rate only the 1-175 of Virginia butter would bring the higher price. Virginia dairymen are thus losing approximately two million dollars in the value of their farm butter annually on account of inferior quality. Neither can the creamery, the cheese factory, the ice cream establishment nor any other dairy plant make high quality products from low quality milk or cream. Furthermore, a good quality in dairy products increases consumption and consequently reacts to the advantage of the dairymen whereas poor quality lessens the demand for dairy products and encourages the use of substitutes.

Sanitary methods are of more importance than expensive equipment in producing clean milk. In fact, very simple and inexpensive equipment is all that is needed in order to produce clean milk.

The four important essentials in clean milk production are as follows:

1. **Clean Cows and Milkers.** The cow should be kept clean and her udder and flanks wiped with a damp cloth before milking. The milkers' hands should be clean and dry.

2. **A Covered Milk Pail.** A milk pail with a small opening and a hooded cover will prevent most of the dust and dirt from getting into the milk.

3. **Prompt and Thorough Cooling.** The milk should be cooled promptly to a temperature below 50°F., if possible. This will prevent the rapid multiplication of bacteria. A small tubular or conical cooler with ice water on the inside and milk running over the outer surface in a thin sheet is the most efficient for this purpose. If this is impossible the milk can may be placed in a tank of cold water and stirred frequently until cold.

4. **Sterilized Utensils.** All the milk utensils should be sterilized daily with live steam or else placed in a receptacle and boiled for 20 to 30 minutes.

If you are producing cream the separator bowl should be thoroughly washed and scalded after every using; the cream should be thoroughly cooled before adding to other cream and delivered while still in fresh sweet condition. If you are making farm butter the more quickly you can ripen and churn the cream the better the butter will be. Cream that is ripened and churned before it gets over two days old makes the best butter.

Better Marketing

After dairy products of excellent quality have been produced economically, then it is time to begin talking about marketing them to better advantage. You have already listened to some excellent addresses on cooperative marketing. This is the second big factor in profitable dairying. While I am not scheduled to talk on this phase of the subject, I want to make this one suggestion. Producers throughout Virginia ought to associate themselves with the organized co-operative dairy marketing associations of which I have

Unfortunately most dairymen are still in the business with nothing but scrubs or grade cows. These cows were not bred particularly for milk production and it is not to be expected that they will produce liberally. Virginians love thoroughbred horses. In fact, the state ranks second in the union in this respect. You do not start on a running race or a fox chase with a big Percheron horse. He is not bred for this purpose. You use a thoroughbred. He can run and he can jump. He is bred for speed. If a dairyman expects to win in the race for economical milk production he must make use of a cow that is bred for "speed in milk production." This means a purebred cow of one of the distinct dairy breeds.

What a dairyman can do when he observes the principles mentioned above — culling the herd of unprofitable cows through cow testing association records, using a purebred sire, and gradually working into purebred cows may be seen from the following table compiled from the actual results of one Pennsylvania farmer.

Herd in Bradford County, Pennsylvania Association

Grades	Year	Pounds of milk	Pounds of Butter Fat	Cost of Feed	Returns Above Feed
Grades	1914-15	7150	274	$45.90	$46.50
Grades	1915-16	7067	273	44.89	59.74
Grades	1916-17	8221	305	61.57	87.27
Grades	1918-19	9109	346	120.16	197.42
Purebreds	1919-20	11720	454.5	193.49	222.53

This man started with 10 head of grades, he gradually weeded out the low producers detected by the cow testing association. He kept a purebred bull and saved the heifer calves from his best cows. Furthermore, he got a start in purebreds and gradually worked more and more into a purebred herd until in 1919 he disposed of the last of his grades and had a purebred herd throughout. His herd of eight purebreds — nearly— the same sized herd with which he started in 1914 — averaged 11,720 pounds of milk, 454.5 pounds of fat and after paying for the feed returned to their owner $222.53 per cow. There are a lot of dairymen in Virginia who could duplicate or even excel this man's results by adopting his methods.

Healthy Cattle

Time does not permit an extended discussion of the importance of tuberculin tested herds and the desirability of the accredited herd plan for the elimination of tuberculosis. Since we are to have an address on "Bovine Tuberculosis," it will be sufficient for me to say that a sick cow does not produce as much milk as a well one, and that from the economy of production standpoint it is of highest importance that the herd be healthful.

Economical Feeding

Nothing need be said at this time on the matter of economical feeding since we are also to have an address on this subject. The speaker will no doubt bring to you a message concerning the importance of a properly balanced ration both in kind and amount.

Comparative Production Purebreds vs. Grades — Holsteins

	Age	No. Cows	Lbs. Milk	Lbs. Fat
Grade Holsteins	2 yr.	80	6164	235.0
Purebred Holsteins	2 yr.	36	7771	276.8
Grade Holsteins	3 yr.	111	6480	234.6
Purebred Holsteins	3 yr.	78	8368	287.4
Grade Holsteins	4 yr.	140	6977	256.6
Purebred Holsteins	4 yr.	42	8017	273.2
Grade Holsteins	5 yr.	120	7271	258.1
Purebred Holsteins	5 yr.	50	9581	329.6
	Over			
Grade Holsteins	5 yr.	256	7723	282.7
Purebred Holsteins	5 yr.	102	8420	311.4
Average for Grade Holsteins		707	7124	260.4
Average for Purebred Holsteins		306	8467	299.1

It is to be noted that the purebred Holsteins of every age class excelled their grade friends in milk and butter fat production. The average production of the 707 grade Holsteins of all ages was 7,124 pounds of milk and 260.4 pounds of butter fat. The 306 purebreds averaged 8,467 pounds of milk and 299.1 pounds of fat.

Comparative Production Purebreds vs. Grades—Jerseys

		Age	No. Cows	Lbs. Milk	Lbs. Fat
Grade	Jersey	2 yr.	47	4911	248.1
Purebred	Jersey	2 yr.	10	4482	236.1
Grade	Jersey	3 yr.	48	5329	270.1
Purebred	Jersey	3 yr.	20	4855	269.5
Grade	Jersey	4 yr.	38	5310	283.9
Purebred	Jersey	4 yr.	17	6456	340.8
Grade	Jersey	5 yr.	28	6284	292.2
Purebred	Jersey	5 yr.	10	5720	307.8
		Over			
Grade	Jersey	5 yr.	145	5763	286.7
Purebred	Jersey	5 yr.	44	6106	328.8
Average for Grade Jerseys			306	5556	275.1
Average for Purebred Jerseys			101	5718	307.8

Purebred Jerseys likewise excel their grade friends on the average in milk and fat production. The average for 306 grades was 5,556 pounds of milk and 275.1 pounds of fat, while the 101 purebreds averaged 5,718 pounds of milk and 307.8 pounds of fat.

It is therefore the part of wisdom for the dairymen to secure one or more purebreds of known high producing ability and save the heifer calves from these cows and a good purebred bull of high producing ancestry. In due time the dairymen will grow into a purebred herd and when he does so he will have a more profitable herd than his friend who has been content to keep scrubs or grades.

Pearl	Daughter Tina by ¾ Jersey	348
Daisy	Daughter Tina by ¾ Jersey	306
Plum	Daughter Tina by Purebred Guernsey	447

The two daughters by the grade Hereford bull were much inferior to their dams, while the two daughters by the three-fourths Jersey bull were considerably better than their scrub dam. The daughter by the purebred Guernsey proved to be an excellent producer with a record of 447 pounds butter fat per year. This is a clear illustration of the value of a purebred sire.

Cooperative Bull Association

How to secure the service of a purebred bull of good type and high producing ancestry at a reasonable price is a real problem to the dairy farmer. Such a sire is high priced and the dairyman with only a few cows feels that he cannot afford the price especially since at the end of two years he must secure another sire in order to avoid inbreeding.

The answer to this problem is found in the co-operative bull association. A number of farmers in a community within a radius of two or three miles and having a total of approximately seventy cows form one "block" of the association. Three or four similar blocks are formed in other parts of the county or adjoining counties. These men organize the association and purchase a sufficient number of high class sires to place one in each block. At the end of two years the bulls are rotated from block to block. If there are four blocks the initial purchase of four sires lasts for eight years.

The usual cost is about $15 per cow. The cost for a farmer having 10 cows is $150. Since there are about 70 cows in each block the plan enables the farmers to purchase $1,000 bulls. In an association of four blocks a farmer with 10 cows gets the use of four one-thousand dollar bulls for eight years at a cost of only $150. The cost of keep for the bull is also small since each farmer pays only a fractional part of the cost of keep.

These associations are doing a splendid work throughout the country in improving the quality of the dairy cattle with a consequent lessening in the cost of production. Virginia dairymen may put dollars into their own pockets by the organization of more co-operative bull associations.

Purebred Cows Produce More Milk Than Grades

Purebred cows also play a part in economical production. The low average production per cow in Virginia may be accounted for partially by the fact that there are so few purebreds. Only 1.9% of the dairy cattle in the state are purebreds. One has to search among 50 dairy cattle in Virginia to find one purebred. He has to visit twenty farms before he finds any purebred livestock of any kind.

Purebred cows produce more milk and butterfat than grades, and grades in turn produce more than scrubs on the average. Then again the offspring of the purebreds are much more valuable than that of the animals of inferior breeding.

The higher average production of purebreds may be noted from the following data including the records of over 1,000 Holsteins and 400 Jerseys compiled from the cow testing association records in one county in Pennsylvania.

portance of high records of production in the ancestry of the sire if he is to transmit high production in his offspring. This data is from the Holstein and Jersey herds at the Ohio Experiment Station.

Influence of the Sire

	Lbs. Milk	Lbs. Fat
Av. yield Holstein dams all lactations	7392	231
Daughters Sire A, ancestors *good records*	8568	273
Increase due to Sire A.	1176	42
Daughters Sire B, ancestors *high records*	11599	384
Increase over original dams	4207	152
Av. yield Jersey dams all lactations	5275	287
Daughters Sire C, ancestors *no records*	4588	248
Decrease due to Sire C.	687	39
Sire D, high *producing dam* and *imported sire*		
Increase daughters over dams Sire D.	752	32

It is evident from the foregoing table that Holstein Sire A, backed by *good records* of production in his ancestry increased considerably the yield of his daughters as compared with their dams.

A second Holstein sire was then purchased to use on the original dams and their daughters. This bull cost almost double the price of the first one on account of the high records of production in his ancestry. Was this expenditure justified? The answer is best found in the records of his daughters, which average 11,599 pounds of milk and 384 pounds of butterfat, an increase of 4,207 pounds of milk and 152 pounds of butterfat over the original dams.

The first bull used in the Jersey herd was supposed to be a good one since he came out of one of the best Jersey herds in the state. His dam, however, had no *record* of production. This bull was an unfortunate gamble owing to the lack of knowledge of the producing ability of his dam. He graded the herd down instead of up, his daughters yielding less than their dams by an average of 687 pounds of milk and 39 pounds of butterfat.

A Jersey bull was then secured from a *high producing dam* and he has brought the herd back to practically the same level as before the use of the bull having no records of production in his ancestors.

Another illustration of the value of a purebred sire may be noted from the experience of a real dairy farmer. He had a scrub cow from which he raised two daughters by a grade Hereford bull, two daughters by a three-fourths Jersey bull and one daughter by a purebred Guernsey bull. Their producing ability is shown in the following table:

Value of a Purebred Sire
L. L. Houske, Halstead, Minn.

		Yearly record Lbs. fat
Tina	A scrub cow	221
Beauty	Daughter of Tina by Grade Hereford	104
Dido	Daughter of Tina by Grade Hereford	49

by weeding out the poorest of his cows, raised his herd average the next year to 9,400 pounds of milk, 372 pounds of butterfat, and return above feed cost of $96.96.

It is the record obtained through the cow testing association that makes this sort of improvement possible. In 1910-11 there was one testing association in Pennsylvania and the average production of the 516 cows in the association was 5,724 pounds of milk and 234.5 pounds of butterfat. In the year 1920-21 there were 50 associations in the state including over 17,000 cows and the average production had increased to 6,724 pounds of milk and 259.1 pounds of butterfat.

As an example of the progress that can be made in dairying through the cow testing association, the use of good sires, and the gradual introduction of purebred cattle, the following table is given:

Five Years' Record of the Grove City Cow Testing Association, Mercer County, Pennsylvania

Ave. per cow:	1917-18	1918-19	1919-20	1920-21	1921-22	Increase in four years
Lbs. of Milk	5098	5754	6011	6309	6576	1478
Lbs. of Butterfat	225.00	261.00	280.00	296.10	303.90	78.90
Value of Product	$125.45	$184.60	$201.30	$165.29	$139.10	$13.65
Cost of Roughage	35.84	47.32	50.85	36.46	35.33	.49
Cost of Grain	38.44	54.53	72.65	61.38	50.11	11.67
Total Cost of Feed	73.28	101.85	123.50	98.29	85.44	12.16
Value of Product Above Feed Cost	52.17	82.75	77.80	67.00	53.66	1.49
Returns for $1 Expended for Feed	1.71	1.81	1.63	1.68	1.63	.08
Feed Cost per 100 lbs. of Milk	1.43	1.71	2.05	1.56	1.30	.13
Feed Cost per Pound of Butterfat	0.32	0.39	0.44	0.33	0.28	.04

The records in the above table from the Grove City Cow Testing Association, Mercer County, Pa., shows some interesting figures. In four years there is an increase of 1478 lbs. of milk and 78.9 lbs. of butterfat per cow.

Virginia needs more co-operative cow testing associations in order to assist with the culling out of inferior cows with a consequent reduction in the average cost of producing milk and butterfat.

Increasing Production Through a Purebred Sire

If the dairyman is to make further progress in increasing the efficiency of his herd after he has culled out the low producing cows, he must mate the best cows in his herd with a purebred bull backed by high producing ancestry. In fact, the man who expects to raise the heifer calves to replenish his herd cannot afford to use anything else but a purebred bull. It goes without saying that the bull should be right from the standpoint of type. He should have a straight top line, a strong constitution and large feed capacity. The importance of high yearly records of production in his dam and grand dams cannot be over emphasized. The following table illustrates the im-

Yearly Record of a Herd of Sixteen Cows

Lbs. Milk Yearly	Lbs. Fat Yearly	Value of Product	Cost of Feed	Returns Above Feed Cost	Loss	Returns for $1 Feed
5388	196	$62.94	$68.73		$5.79	$.92
6947	222	70.92	70.24	$.68		1.01
2795	157	52.31	66.23		13.92	.79
5009	214	69.74	68.47	1.27		1.02
6691	240	76.11	70.94	5.17		1.07
7235	246	78.61	72.05	6.56		1.09
3885	188	62.92	66.23		3.31	.95
4230	156	49.06	65.95		16.89	.74
8157	319	107.91	74.37	33.54		1.45
6733	237	76.38	69.82	6.56		1.09
5112	204	65.32	69.32		4.00	.94
8126	262	83.45	68.73	14.72		1.21
6857	301	97.32	68.73	28.59		1.42
5111	202	65.94	74.37		8.43	.89
5034	212	72.37	71.64	.72		1.01
4793	203	68.68	70.52		1.83	.97
Av. 5757	223	72.50	69.77	2.73		1.04

A neighbor of the foregoing man was also engaged in dairying. He had the same market, the same type of soil and belonged to the same testing association, but note the difference in the character of his herd.

Yearly Record of a Herd of 10 Cows

Pounds of Milk	Pounds of Fat	Value of Product	Cost of Feed	Returns above Feed	Returns per $1 of Feed
6262	292	$121.94	$55.53	$66.41	$2.19
7986	305	124.47	54.71	69.76	2.28
5947	260	102.74	50.99	51.75	2.05
6847	358	147.11	57.21	89.90	2.57
10387	391	158.05	67.60	90.45	2.34
10966	368	148.63	68.92	79.71	2.16
10389	328	135.62	64.68	70.94	2.10
8726	328	134.92	59.79	75.13	2.26
7344	336	139.84	59.40	80.44	2.35
6897	298	119.02	50.48	68.54	2.36
Av. 8173	327	133.23	58.93	74.30	2.26

This man had a herd of real cows. Their average production was 8,173 pounds of milk and 327 pounds of butterfat. After paying the feed bills these cows had left to their credit $74.30 each, with a return of $2.26 per every dollar worth of feed eaten. This man was not making any complaint about the dairy business. He was making money. His cows were keeping him rather than he keeping the cows. It is interesting to note that this man

The cows yielding over 10,000 pounds of milk gave a correspondingly large yield of butterfat. They ate on the average over $88 worth of feed, but after paying their feed bills had left over $106 per cow. As the yield decreases the average returns above feed cost decrease until we reach the lowest yielding class. These cows while eateing but $57.22 worth of feed on the average, did not pay the feed bills by $4.25 each.

The feed cost of 100 pounds of milk with the highest producing group was only $.81 while with the lowest producing group it was $1.86. Likewise the feed cost of a pound of butterfat with the highest producing cows was but $.233, while with the lowest producing group it was $487.

It is clearly evident that a high yield per cow is the first essential in lowering the cost of producing milk and butterfat.

Culling Out the Low Producers

The question that naturally arises is, "How can I get a high producing herd?" Naturally the first essential is to get rid of the unprofitable and low-yielding cows. This is a difficult proposition without the actual records of the production of each and every individual cow in the herd. Guess work should have no place in the process of weeding the herd. Most dairymen think they know the best cows in their herds, but even the owner who is working with the cows every day may be badly mistaken. For instance, in one of the cow testing associations in Pennsylvania each owner was asked at the beginning of the year to select what he thought was the best cow in his herd, and the poorest cow in his herd. At the end of the year it was found that "Minnie," a cow which one dairyman thought was the poorest cow in his herd, was not only the best cow in his herd, but also the best cow in the whole association including over 300 cows. She did not give a very large amount of milk when fresh, but kept up the flow as the lactation period advanced and stood dry but a short period of time, hence made a much larger yield during the year than her owner realized.

Weighing the milk, testing it, and keeping a record of the feed eaten is the only sure way of distinguishing the profitable from the unprofitable cows in the herd.

The best and cheapest way of getting these records is through the cow testing association in which a number of dairymen co-operate in hiring a man to keep exact records of production on every cow in the respective herds.

The following table showing the actual records of a herd in one of the Pennsylvania associations illustrates the importance of the testing association in detecting boarder cows.

An inspection of these records reveals that the average returns above feed cost were only $2.73 per cow. What is wrong with this herd? Further inspection shows that seven out of sixteen cows were not paying for the feed they ate. These cows were eating up the profits from the remainder of the herd. In fact these seven "boarder" cows ate up the profits from the whole herd except for two cows. In other words, he could have kept but two cows and made just as much profit as he now makes from his whole herd, when the "boarders" are included. This sort of dairying is plainly unprofitable. No wonder the owner of this herd was discouraged and had concluded that there was "no money" in dairying.

SECOND SESSION

SUBJECT: COOPERATIVE MARKETING AND PRODUCTION

THE DAIRYMEN'S PART IN THE SUCCESSFUL MARKETING OF DAIRY PRODUCTS

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There are two ways to increase the profit in dairying. The first is to secure a higher price for dairy products, and the second is to produce the products at lower cost. While the dairymen of Virginia fall considerably short of controlling the first of these factors, yet they have the second largely in their own hands.

Importance of Good Cows

The most important factor in lessening the cost of producing milk and butterfat is good cows. The average dairy cow in Virginia according to the last census produces only 2,511 pounds of milk in a year, an amount too low to yield the owner even a reasonable profit. The state ranks twenty-third for number of cows, but only thirty-fifth for average production per cow. The same amount of milk ought to be produced with less than one-half the present number of cows in ordor to make the business worth while financially. We are therefore forced to conclude that what Virginia most needs is not so much more cows, but better cows.

The importance of good cows in the economical production of milk and butterfat may be noted from the following table prepared from the records of a cow testing association. The cows were classified according to yearly production, those yielding 10,000 pounds of milk yearly being classed together. Those yielding from 9,000 to 10,000 pounds of milk formed the second class, and so on by differences of 1,000 pounds of milk until the lowest class giving less than 4,000 pounds annually was reached.

The table follows:

Relation of Yield to Cost of Production

No. of cows	Av. No. lbs. milk per cow	Av. No. lbs. fat per cow	Av. cost of feed per cow	Av. returns above feed cost	Feed cost of 100 lbs. milk	Feed cost of 1 lb. butterfat
8	10875	380	$88.59	$106.82	$0.81	$0.233
14	9396	343	88.25	79.18	.93	.259
26	8434	301	83.46	63.86	.98	.273
41	7381	277	81.18	52.11	1.10	.293
40	6499	240	73.59	43.65	1.13	.307
39	5540	209	65.91	34.56	1.19	.315
25	4605	176	56.61	27.20	1.23	.322
10	3061	117	57.22	4.25	1.86	.487
Average	6710	248	73.62	46.80	1.09	.297

from the start; the men employed to manage the associations are not all familiar with just the very best way to proceed; they have to go on slowly in some cases. So when you go into these associations you can face the situation with a feeling that things cannot be accomplished right away but it does take time. Have the right understanding with the members and employ people who understand the inside of that particular production.

We often hear this thing spoken of as being so new—new principles. The principles are as old as old can be. When you come right down and consider the basic facts there isn't so much new to it. The things the new laws have given are simply legal approval to farmers handling their own products in a different way. It's pretty much the same as private agency for handling the products.

The opinion of some people is that these associations being approved and offering such possibilities in some cases that they can go ahead and grow as much as they desire and the association can handle it. You have just got to get that out of your mind; if you don't the products will drop in price and you will have to pay in the end. The associations that are most successful today are the ones that are giving most consideration to the producing end and instructing their members to produce as nearly as they can with the demands of the market so that the association doesn't have to handle undesirable products.

There are attorneys who are advising farmers to stay out of these associations, but that's because they've gotten the idea that the farmers are combining to get higher prices. It's the same now as before the new laws, that when you interfere with the supply and demand you're subject to the penalty. Make up your mind that if these associations are operated in the wrong way you will be liable. The farmers are perfectly safe in going ahead and joining the associations and there need never be any fear as long as the associations are properly handled.

There has been the thought uppermost in the mind of the consuming public and, of course, their representatives in Congress and the Legislature of the United States, that the business of these co-operative organizations were largely for boosting prices and restricting trade in certain respects. The new laws include that same principle, that if the co-operative association in its functioning brings about a condition where it is evidence of boosting prices, etc., interfering with the natural channel of trade that that association's officers and members can be brought in and made subject to the terms of the law. There is one safety point about that that makes it unnecessary for you as producers or farmers who are contemplating joining such co-operative associations, that is, that it is practically impossible for an organization to ever function as a monopoly. While you can function for a very short period, yet over a long period of time it is impossible to so manage your association that any interference can be brought about. The cause or the inspiration for these most recent laws was brought about because of the bringing into court of the officers of organization especially when they start out as bargaining associations. Things looked quite serious for those officers at different times and fortunately not any of their functioning was found to be bargaining purposes. It was ascertained that they had no intention of boosting prices unreasonably or interfering with the regular channel of trade. This was so evident when the officers were brought into court that they were not brought within the law at all.

In none of these associations, especially the milk market associations, have they functioned in any way to make them liable under such a law. But I want you to keep in mind that in these new laws that if at any time the association takes upon itself to act in an unusual way, it is still subject to the law. The new laws do not give the association authority to go ahead and disrupt regular channels of operation of trade in any way.

The fortunate part is that the officers of such organizations have no such point in view. They want to better the results of the members' work and look to the co-operative marketing association to accomplish those results for them. I am inclined to think that the co-operative marketing movement has been emphasized in being able to accomplish more than actually can be accomplished. It is the one movement that offers a better condition or possibility of securing better results for the marketing of farm products, but I think it has been spoken of in such a way that if an association has been formed and results are not forthcoming in such a way as members expect that they become disturbed and discouraged. They believed that if they got into the co-operative market that they could go ahead and produce any amount and dispose of it at high prices. One of the duties of the associations is to give good advice to its members relative to the production, in other words, to produce in accordance with the demand. It is well to get those facts in mind right in the start. The co-operative market cannot do the whole thing. The organization is not one thing and you another. If you will just stop and consider, suppose I drop out and you drop out and the other fellow drops out, then what have you? You hear it said, why does the association do this and why does it do that? Now when you come right down to it who is the association? None other than yourself or yourself with your neighbor and all together make possible this association. Then, too, you must remember that the thing cannot be perfect

got together some figures and pamphlets, etc., which I could distribute among you, thinking I might be able to tell you something which would help you. Well, I got as far as New York City and stepped into a telephone booth to phone a party there. I placed my bag not far away and when I came out about two minutes after, it was gone—and so was my speech. I shall have to go rambling on somewhat and the pleasure which I expected to xeperience is turned to something else. This knowledge that I am not fully prepared has placed me in the position of the Irishman, Pat, for while sitting here and listening to addresses which I should have otherwise enjoyed, I have sensed a sort of uneasiness.

"Pat's wife was very ill and had had a council of doctors. They had all said she must die. She, therefore, called Pat to her bedside and said, 'Pat, I am dying. I have always been a good wife to you. I have worked and saved and now that I am leaving you, will you grant me my last request?" and with tears streaming down Pat's face he replied, 'Yes, Bridget, what is is it?' 'When I am wrapped in that white shroud and you are following my remains to their last resting place, will you ride with me mother?" Pat thought a minute and then replied, "Yes Bridget, I promise, but you are taking all the pleasure out of the occasion."

I like, when I am talking about a subject, and especially the subject of dairying, to think back to what makes us interested in this subject. We speak of milk and butter and cheese and the different by-products and only think of them in dairy terms. I have pondered this subject over in my mind clear back to the days of creation and thought of the whole affair and why it was so. How the Great Builder stored up mysteries for the people. There was a Newton to discover gravity; a Watt to discover the power of steam and an Edison to discover the value of electricity for all our uses, but way back in creation there was invested in man at a period of time when he was helpless and knew not his needs or wants, a sort of craving. We call this craving—appetite, and that appetite in man and most of the lower animals is for what? —milk.

The thought before us is dairying, bettering our conditions, intensifying our efforts for our future needs. I believe dairying is but in its infancy. I believe this old state of Virginia will be filled up with dairies and you will get for your products better prices than you are getting today. When I was a boy my father kept ten cows. We set the milk in tin pans. We let it sour and the cream rise to the top and then mother took a tin ladel and skimmed off the cream which was kept until sour enough to churn. Then the butter was packed in wooden fifkins which held about one hundred pounds, and kept until fall when a buyer came around and bought the seasons produce. A good cow in the seven months which we milked them would make about a firkin of butter a year. Our change shows that several cows have produced more than 1,000 pounds of butter in a year today, all because of better breeding and better methods of dairying and feeding.

Jealousies existed among farmers and there was no cooperation. If we received a cent a pound more than our neighbor who lived a short distance away he would not speak to one of the family for the next six months.

Today all is changed. We have the telephone, the daily papers, then we took the word of the buyer for what it was worth and now we are posted be-

fore he steps foot on the farm. We had no way of advertising our product and consumption was just what it actually had to be to sustain life. Today milk consumption is increasing rapidly due largely to the advertising of milk and milk products. The Holstein-Friesian Association of America is planning a campaign for advertising our product for future dairymen. There is no food so complete as the milk of the great dairy cow and when the Lord made heaven and earth he made the cow to take care of the child which requires her milk as a substitute for mother's milk. Look back even to the time of the flood. I can think of old Noah giving the very best place in his ark to that cow and bull, knowing that no matter how long it rained, he would be sure of "warm meals" at all hours.

Let us raise our cattle better, let us grow them large and strong so that they will be wanted. Feed them so that they will give the very best milk, then pass on to the outside world how we did it. The association which I represent has been doing a great deal of advertising locally and we are going to do a great deal generally. There has been an appropriation of $30,000 made for advertising Holstein milk during the next year as well as the same amount for advertising the Holstein cow. We are not going to say anything against other milk but we are going to advertise Holstein milk. We claim Holstein milk is most economically produced and that in composition it is the most like mother's milk which contains from 3½% to 4% of fat. The economy in keeping the Holstein cow consists in the fact that she can be fed a great amount of roughness of the field and the farm together with grain and alfalfa and in return will produce a greater volume of milk than any other known breed.

You have heard a great deal of tuberculosis eradication and tuberculosis testing. I am for it. I work just as hard as any man could for it. I was in Kansas City at the National Holstein Association meeting last year and introduced a resolution calling on congress to appropriate a greater amount for the eradication of tuberculosis so that we could continue testing the whole year round. The secretaries of the different state organizations got back of this move and I understand that congress has made such an appropriation and we will not have to stop testing because of the lack of funds. In New York State we used $2,000,000 last year and the coming year will probably take more to do the work. With this eradication and proper advertising of our products we are going to place dairy products squarely before the people as the greatest food and most healthful food which they can buy, and after we read an advertisement long enough we are surely going to believe in it and use the product which is advertised.

A friend of mine tells me of his experience when Shredded Wheat Biscuit first came to the attention of the public. His office was in the city and his home in the suburbs and he rode back and forth night and morning on the trolley car. In the rack above was the placard picturing luscious biscuits served with cream and various delicacies and the sign "Eat Shredded Wheat Biscuit." Before going home one night he bought a package and asked his wife to serve it for breakfast. This she did. Neither cared much for it so they gave what was left to the dog, and the dog would not eat it. The instance was forgotten but still he read, "Eat Shredded Wheat Biscuit." He again asked his wife to study the directions on the package and serve it some other way and finally they became users of Shredded Wheat Buscuit. But when

he again tried the dog, the dog would not eat it and the only conclusion he could draw was that the dog could not read the advertisement. You may think you cannot be lead into any idea. We do not want to lead you to ideas that are wrong but we want to lead you right by using our products and more of them.

I have listened to the talks of preceding speakers and endorse what they say, particularly on intensified farming. You have a wonderful climate here and I believe if you would practice keeping your cattle in the barns, raising more alfalfa and silage, building better barns and not allowing your animals to become exposed to the chilly winds, you would increase their production materially and thus from ten cows you would get what you are now getting from twenty.

One of the secrets of the dairy business is to decrease the cost of production and increase the amount which we are producing and to do this requires some thinking. We must all work for the common cause of boosting the dairyman through personal efforts and by advertising, and just let me add by using more of our good Holstein cattle. They are wonderful money makers.

I thank you.

THIRD SESSION

SUBJECT: DAIRY PRODUCTION

DAIRY CATTLE FEEDING AND MANAGEMENT

"HOW I RAISE MY DAIRY CALVES."

MR. R. L. HARRISON, Dairyman, member of the Fairfax County Cow Testing Association, Herndon, Virginia.

Ladies and Gentlemen of the Convention:

I am placed in rather an embarrassing position to-day, but it is always said that "Misery loves company," and I do not believe that I am quite as embarrassed as the gentleman whom I am to represent. Mr. Bready was selected to give this little talk and inasmuch as he couldn't come and I was coming I was selected to talk for him.

Inasmuch as I have had some little experience in raising cattle, I felt like I might don Mr. Bready's regalia for a little bit and say what I know of it, but not what Mr. Bready knows. I don't like to be a fellow who is going to forge anything so I'm not going to forge Mr. Bready's experiences on you, but will give you a little idea of where I might be called on to say something about raising cattle — raising calves is the first thing I learned to do. Unfortunately, as it is for every boy, I had a limited education, but I am really glad to think that I had a really good education along the line of working. It's good for the constitution to get busy and do something. I believe in the brain being busy but also the body.

Co-operation is not a new thing. I recall seeing in a paper that way back in Washington's time that he recommended an appeal to congress for agriculture and talked along lines of co-operative agriculture. So we are mistaken in thinking of this as a new thing.

Some twenty-five years ago, I had a little village trade. I made butter myself and delivered to private trade myself. Bought the calves, raised the heifers, vealed the bulls and got something out of the dairy business that way. I bought the cow after I had tried her out. If she wasn't good I sent her to the butcher.

This cow testing association is a big step forward. I didn't have any method of finding out but from the practical knowledge I had we found out just what was a pretty good cow.

I never followed the plan of substituting very much for calves. Take a baby calf and feed it its mother's milk for two or three weeks. I never allowed the calf to nurse its mother, but milked this milk and fed it to the calf warm. Give it what you think it needs. Do not over-feed calves. After some three weeks, I feed half skimmed milk and a little clover hay and little grain ration, and soon see a good calf coming along. I use skimmed milk then altogether if I have it, if not feed it water, when skimmed milk is high and scarce.

Let us learn to produce economically and produce as much as possible.

MY CROP ROTATION FOR MY DAIRY FARM AND WHY I USE IT

MR. H. W. GILLS — Dairyman
Member of the Henrico County Cow Testing Association,
R. F. D. Richmond, Virginia.

Mr. President and Gentlemen of the Virginia State Dairy Association:

The size of my farm is 72 acres, of this amount we only have just a small pasture — I mean by this just a place for cows to *walk* and take *exercise*, as I figure that with a small acreage, I can practice a good farm rotation and feed from silos, and come out ahead.

Now, in my judgment, in the practice of a well planned farm rotation, a man can succeed, and in failing to do this, it means an uphill business, if not failure.

I mentioned just a short time ago about pasture. Well, down where I live in Henrico county, after the days grow long and hot, our grass is about gone, and for this reason it pays me, I figure, to till my soil and fill silos and my barn loft with hay. For the use of silage, I use Eureka Ensilage Corn almost as a whole, for several reasons; first, because it will grow more tons per acre than will anything else that I can plant on my farm, and in the next place, it will make the best silage, and is the easiest and quickest harvested.

Now, the number of cows, young and old, that we have at this time is just about fifty head, thirty-four of which are milking one hundred and twenty gallons per day, the rest are dry cows and young stock. We figure to feed silage, and feed it all the year around, consequently, that means we should have somewhere around 250 to 275 tons of silage. All fields at this time are seeded to wheat, oats, crimson clover, and alfalfa; thirty acres in wheat, twenty acres of this amount we expect to graze off, and same land is to be limed and manured, and put in corn to be used for silo filling, the remaining ten acres I expect to thrash so as to have straw for bedding. This same ten acres I expect to plow, and manure after plowing, and seed to Rust-Proof Oats and White German Clover, to be used for purpose of early fall grazing as that is the season of the year that cows seem to suffer the most for the lack of something green to start them off again, and get them in good shape for winter milk.

Fields that are now standing in crimson clover and oats, are to be cut with wheat binder and as much as is necessary to be used for summer silage, as it has been my experience that this is a very good feed, a great deal better than dry hay. Other clover and oats will be fed in green state. This plot of land has had the very best top-dressing that I could give it early in winter, so as to save all clover and oats. This will give me a fine crop of hay, and too, will give me a good deposit to my soil to grow another fine crop of corn. Other lands that are now standing in oats, oats will be saved for grain to be used for horses and to grow *good calves*. This same land to be plowed and harrowed, and sown in Brabham Peas and Virginia Soy Beans, they to be used for hay, and in turn will give a good nitrogen deposit to soil. This will bring me in to around the 15th of June, and in the meantime, we have had to keep pretty busy, as we do lots of harvesting of grain, and too, we

expect to have a fine crop of alfalfa hay to care for, also the corn crop to look out for and not letweeds and grass run away with same. Corn tilling. Boys, don't forget to work your corn and don't let anybody fool you about this half way of working your corn crop with these old no account machines. I mean by what I say, to get yourself a good *turn-plow* and *five tooth cultivator*, and keep at work after each rain, so as to save all moisture and at the same time killing all young grass and so on. Don't plant any corn that you can't manure the land and till in this way, as it will pay to have small acreage, well manured and worked, rather than a larger amount not so well cared for.

Now, we have arrived at around the 15th of August. At this period, we are getting wagons, cutters, etc., in good shape to start cutting corn silage. We do not fail to keep blades close to ledge and sharp to cut as fine as possible, to get inasmuch as we can, and too, I have found that it will keep a great deal better, the finer you have it, and cows seem to clean it up better when it is cut fine.

Now, one of the ten acres that was in wheat and corn just cut from, will be sown to alfalfa; other back to crimson clover and oats, and lands that are growing peas and beans will be sown to wheat, and this, you will find, will keep the farmer pretty busy.

This will show rotation for this year; next year rotation of crops will be reversed, so as not to have fields growing same thing two years in succession. This rotation has brought a poor farm that I started with eight years ago up to a good high state of cultivation.

Field Crops — 1923-1924

Farm of H. W. Gills, R. F. D. No. 1, Richmond, Virginia

	First year	Second year	Third year
Field No. 1 Acres 10	Alfalfa	Alfalfa	Alfalfa
Field No. 2 Acres 9	Wheat Corn Alfalfa	Alfalfa	Alfalfa
Field No. 3 Acres 6	Oats Crimson Clover Corn Wheat	Brabham Peas Wheat	Corn
Field No. 4 Acres 11	Corn Wheat	Peas Wheat	Corn
Field No. 5 Acres 11	Oats Soy Beans (Virginia)	Corn Alfalfa	Alfalfa or Clover
Field No. 6 Acres 10	Wheat Oats & Crimson Clover (grazing)	Corn Alfalfa	Alfalfa or Clover

BALANCING THE DAIRY RATION PREVENTS LOSS

W. J. Fraser — Professor of Dairy Farming, University of Illinois

It is said by a good student of dairy farming who has traveled much over the United States studying dairy conditions for many years that over one-half the dairy cows are under fed. A county agricultural agent in central Illinois said after making a careful study of this subject that over 90 per cent of the dairy cows in his county were under fed. These striking facts lead us to inquire what is the basis of economical milk production.

Goal of Dairy Farming

To the practical dairy farmer, the problem of the ration is not merely its technical composition of feeds and food elements to meet the requirements of the cow in making milk but also its adaptability as a ration to fit his situation and circumstances. He must then fit his farming to that ration. The ration is to be produced as well as fed. In the whole business of dairying, there is as much necessity, economy, and profit in producing the proper ration in the right way as in choosing the suitable and efficient ration and feeding it under such conditions so as to secure the largest and best result. To state it another way, the fundamental basis and unchanging goal of dairy farming is the production of the most milk per acre and per man at the least cost. This is a three horse team and the units must be evenly hitched and trained to pull together. It is in that setting that we should study rations. The meaning and effect of balanced rations may be illustrated from actual experience by a six years' test at the University of Illinois.

Milk Per Acre Demonstration

The purpose of this demonstration was to see how much milk and fat could be produced per acre of crops under ordinary farm conditions, all the feed being raised on the land. Twenty acres, all the land available for this purpose, were used. An average of 10.6 good grade cows were kept for the six years. They produced an average of 7,470 pounds milk and 262 pounds fat per cow, making 3,888 pounds milk and 136 pounds fat per acre of land. This is from two to four times as much per acre as is produced on strictly dairy farms.

The cows were made comfortable by being allowed to run loose in the barn except during feeding and milking time. During warm weather, they ran in a shaded yard. The housing and care were no better than most dairymen give their cows. This leaves the factor of feed as the only one necessarily different from those on most dairy farms. The methods were all economical and practical. The feed used in this demonstration was all home grown, consisting mainly of corn silage and alfalfa with corn meal for the heavy producing cows and rye pasture for all the cows during a few weeks in the spring and fall. In the main, though, the feeds grown were corn silage and alfalfa for hay because these two crops produce from two to four times as much digestible nutrients per acre as other farm crops commonly raised and when fed together form a very nearly balanced ration. Corn silage is high in carbohydrates and furnishes the much needed succulence while alfalfa hay is high in protein and minerals which balance up the carbohydrates in the silage. These cows consumed an average of about 38 pounds corn silage, 15 pounds alfalfa hay, and 1 pound corn meal a day for the entire time.

It was interesting to note that these two crops when balanced produced almost three times as much milk per acre as was produced under the conditions found on northern Illinois dairy farms. What could the reason be? It could not be because of the corn silage as that is a common feed in northern Illinois; therefore, it must be because of the alfalfa hay which was grown on about an equal acreage with corn. Following such a line of reasoning led to an examination of the census report, and it was found that the conditions of the country in regard to alfalfa and clover acreage was that one and a half per cent of tillable areas was in alfalfa and two and three-fourths per cent in clover. This furnishes the key note to explain the increase in yield of milk per acre obtained on the demonstration over the ordinary dairy farm.

Loss From Insufficient Ration

A dairy cow capable of producing 8,250 pounds of four per cent milk per year and fed a ration that just meets her requirements uses one-half of her ration for maintenance, leaving only half of the ration available for making milk. The feed for maintenance must remain the same and any reduction of the ration must all come from the half that goes to making milk. Hence, if the entire ration is reduced one-sixth, the part that can be used for milk is reduced one-third, and the cow's production is necessarily reduced one-third.

The feed represents about one-half the expense of maintaining the cow, so if the feed is reduced one-sixth the total expense is reduced only one-twelfth, or eight per cent, while the product is reduced one-third, or thirty-three per cent. A saving of eight per cent on feed brings a loss of thirty-three per cent or four times as much in total receipts.

Loss Caused by Unbalanced Ration

If cows of the capacity mentioned above, having the conditions of feeding, housing, and care of the same quality, had only the protein in the ration reduced one-sixth from the amount required for a balanced ration, the production of these cows would necessarily be reduced one-third, the same as if the entire ration had been reduced one-sixth, because only so much of the rations as is balanced can be used to produce milk. The excess of carbohydrates and fat cannot be used in the place of protein and is an absolute waste, as is also a part of the cow's capacity, care, and housing. It is obvious that feeding a ration that is low in protein has the same effect on the amount of milk produced as would decreasing the whole balanced ration to the same degree.

The real loss from feeding such a ration deficient in protein is usually not realized because the cost of the cow, her care and housing, are practically constant, and it is hard to believe that the slight reduction in the protein of the feed can cause so large a loss in milk and profit. The mistake made in causing this great loss is merely feeding one kind of feed when another one should be fed, such as using timothy hay when clover or alfalfa should be used.

How This Loss May Be Prevented

The reason the large production of milk was received on the demonstration over the average dairy farm was because sufficient protein was furnished

in the alfalfa hay to balance the corn crop ration, and thus avoid the large loss so frequently caused by this lack on dairy farms.

The lack of legumes is the low factor on most dairy farms and causes a great loss that could be easily prevented.

THE RELATIONSHIP OF TYPE TO PRODUCTION IN DAIRY CATTLE

R. E. HUNT, Professor of Animal Husbandry
V. P. I., Blacksburg, Va.

In my work as instuctor in animal husbandry at your agricultural college, I have been confronted with varying statements as to leading individuals and leading families, and just why these various individuals and families were superior to others. This condition exists in all breeds of livestock, and especially with the dairy breeds. It has been due to these varying statements that I have been led to carry on studies along the lines of great animals and families of the different breeds.

A really successful herd cannot be maintained for many generations without a real combination of type with production. An animal that possesses type without production might win in the show ring, but that animal's offspring is very likely to be lacking in production and of a rather inferior type. This is bound to be true in either the first or second generation, while an animal possessing great production but faulty in type may produce very successfully and may even make a really wonderful record in milk production, but as far as a breeding animal is concerned, this animal will transmit certain faults as far as type is concerned, especially weak constitution, poor top lines, thus making the offspring undesirable as far as type is concerned, and of such type that it is practically impossible for them to be a really great producer, so in either case, in one or at most two generations, will run out and not be what they should, and in a really successful dairy herd, type must be combined with production to be a success. In carrying on these studies, a great many very important things have been brought out, and certain individuals and families are very much superior to others, and our work shows the relationship of these individuals. In these tables you will find the three leading dairy breeds in Virginia, taken up from three different and distinct viewpoints. However, they might have all been taken up from the same viewpoint, or all three viewpoints applied to the three breeds for the same results.

Great Guernsey Sires

In the list of eleven greatest Guernsey sires of the breed, as emphasized by the production and the showyard winnings of their offspring, it will be noted that King of the May heads this list and that he has one daughter that produced 1,000 pounds of fat, eight daughters that produced over 800 pounds of fat, and 25 daughters that produced over 600 pounds of fat. As for the showyard winnings of the sons and daughters of King of the May, none of them have won a championship or a grand championship at the National Dairy Show, but four of them won first prize in the individual classes, six won second prize, four won third prize, and six won fourth prize, and according to our method of scoring sires, this gives King of the May a credit of 235 points.

King of the May is sired by May Rose King. The second sire in this list is Ne Plus Ultra. Ne Plus Ultra is by Dolly Dimples May King of Langwater, and he by King of the May. Thus from the viewpoint of sires, Ne Plus Ultra is the grandson of King of the May. A very interesting point not shown in this table is the fact that Itchen Daisy 3d is the dam of both of these animals. We might go on through the list of the remaining great sires, and it will be noted that they are all very closely related, and that they all trace back to the foundation sire, Presto, thus showing that really great transmitting animals of the Guernsey breed must carry the blood lines of this great foundation sire, Presto.

GREATEST GUERNSEY SIRES

	1000	800	600	GC	C	1	2	3	4	Score
1. King of the May By May Rose King	1	8	25	0	0	4	6	4	6	235
2. Ne Plus Ultra By Dolly Dimple's May King of Langwater By King of the May	1	4	24	0	0	3	1	1	0	214
3. Hayes Cherub II By Hayes Branch By Itchen Royal By Golden Secret Out of Rose of Gold Out of May Rose III	1	1	8	3	7	15	11	6	5	204
4. Lord Mar By Prince of La Vrangue Out of The Maid I By Masher By Rydale By Volage By Presto	0	0	11	3	3	10	5	1	0	134
5. Itchen May King By Itchen Red Raider By Itchen Raider By Golden Secret	0	1	8	1	2	7	7	4	2	126
6. Governor of the Chene To Presto	0	1	22	0	0	1	2	2	0	111
7. Bada's May King By May Rose King	0	2	15	0	0	1	2	1	2	92
8. King of Chilmark By Archer of Chilmark By Cora's Governor of Chilmark By Governor of the Chene	0	5	9	0	0	1	0	2	0	89
9. Langwater Royal By Dolly Dimple's May King of Langwater	0	3	12	0	0	2	0	1	0	85
10. May Rose King Out of May Rose II	0	2	13	0	0	0	1	1	1	76
11. Jethro Bass By King of the May	0	2	13	0	0	1	0	1	0	76

World's Record Jersey Cows

As to the world's record Jersey cows, Darling's Jolly Lassie completed her wonderful production of 1,141 pounds of fat on February 17th of this year. She traces back on her sire's side to Stokes Pogis of Prospect, and is out of Old Man's Darling 2d. Old Man's Darling 2d is an inbred Golden Glow Chief cow. This is the only case on record where a cow has made a world's record and in doing so has replaced her dam, who held a world's record in that particular class. Old Man's Darling 2d was world's record cow in the junior 4 year old class, and her daughter is not only world's record junior 4 year old Jersey, but has produced more fat than any other Jersey cow. It seems to me that we will all have to marvel at the Jersey breed in that this cow produced within nine pounds as much fat in 12 months as the cow actually weighs. Jersey cows are the only animals that have been able to produce as

much or more fat in 12 months as their body weight. While some other breeds may have made a greater recod of production, but based on the weight of the cow, no breed has such a record. In following this table of world's record Jerseys, found on page 44, it will be noted that in nearly every case it is a cross of Stoke Pogis and Combination blood lines that has given the results. Combination, being sired by Agatha's Flying Fox, he by Champion Flying Fox, a son of Golden Fern's Lad. It is also noted that the St. Lamberts are wonderful producers. The first world's record Jersey was Dolly's Valentine. This cow was a Tormentor-Ida's Stoke Pogis bred cow. Her production of 579 pounds of fat in 12 months was a world's record. Thus, in 24 years in Register of Merit testing Jerseys have practically doubled their production. This, to my mind, shows the wonderful improvement that has been brought about by better mating, better feeding, and improved methods of handling cows. The chief thing undoubtedly is more successful mating of the individuals. If the breed succeeds in the next quarter century as it has in the past, which to us seems as an absurd thing, but who can tell? At least we must state that these records of world's record Jersey cows shows continuous improvement and I see no reason why Jerseys should not improve in the future as they have in the past.

Great Holstein-Friesians

With the Holstein-Friesian, I simply wish to point out a few of the great individuals. In the table found on page 45 you will notice three families. I have just put in enough of these individuals to show you how they are related, and these tables are not complete in any way. In fact, the great individuals or blood lines of the three breeds present longer tables than it was possible to present here, but they have been worked out in my office and I would be glad to furnish copies to anyone desiring them.

One of the first individuals of the Holstein-Friesians that I wish you to notice is King Segis. King Segis is the sire of King Segis Pontiac. King Segis Pontiac has four sons, full brothers, that are very important. They are King Segis Pontias Count, King Segis Pontiac Emperor, King Segis Pontiac Hero, and King Segis Pontiac Superior. The second son of King Segis is King Segis 10th. He is the sire of those famous animals used at the head of the Carnation Farm herd, Segis Walker Matador and Matador Segis Walker. These two sires are proving to be great transmitting sires at the present time, and there is no reason why they should not, because King Segis 10th is also the sire of Segis Pietertje Prospect, the world's record cow in milk production, having produced over 100 pounds of milk per day for each day in the year. You will also note that May Walker Ollie Homestead, the cow that has produced more fat than any other cow in the United States, along with Duchess Skylark Ormsby, the first cow to produce over 1,200 pounds of fat in 12 months, all trace back to Paul DeKol, a son of DeKol 2nd Prince that was sired by Neptune Jr.

In the second section of this table, headed by Sir Henry of Maplewood, we have such famous animals as Ormsby Korndyke Lad, the greatest producing sire in the east, also Homestead Superb Vale, the sire used so successfully by Mr. Frank S. Walker in his herd. Also, Sir Pietertje Posch, who undoubtedly has given the great production to the Jemima family, because all of these cows

WORLD'S RECORD JERSEY COWS

2-17-23	Darling's Jolly Lassie By Gertie's Gallant Stamp By Pride Olga's 3d King By Pride Olga's 4th Son By Gertie's Son By Stoke Pogis of Prospect	16,425 milk	1141 fat Out of Old Man's Darling 2d By Golden Glow's Chief To Combination
4- 7-22	Lad's Iota By Rinda Lad of S. B. By Gertie's Lad By Rosaire's Golden Lad By Golden Grand By Golden Lad	18,632 milk	1048 fat Out of Ruth Violet By Mastletoe Pogis By Gertie's Stoke Pogis
2-25-20	Plain Mary By Pogis Boy of St. Lambert By St. Lambert Boy 3d	15,254 milk	1040 fat Out of Daisy of Edenton By Dandy of Edenton
2-24-19	Vive La France By Golden Glow's Chief	14,926 milk	1032 fat Out of Sugar in the Barrel By Mab's Rioter of Marion
11-30-18	Sophie's Agnes By Pogis 99 of Hood Farm By Hood Farm Pogis 9th Out of Sophie 19 of Hood Farm	16,213 milk	1000 fat Out of Riggis 91 of Hood Farm By Hood Farm Pogis 9th
1-20-14	Sophie 19 of Hood Farm By Ford Hill Farm Chief By Merry Maiden's Son By Brown Bessie's Son By Combination 3d	17,553 milk	999 fat Out of Phil's Seituate By Philosopher To Stoke Pogis 3d
9-11-13	Eminent's Bess By Larilla's Eminent Lad By Fontaine's Eminent By Eminent	18,783 milk	961 fat Out of Hood Farm Fairy Maid By Montague Meadow Pedro By Pedro Brook Dale By Pedro
1-24-09	Jacoba Irene By King of Corfu By Matilda's Duke By Ida of St. Lambert	17,253 milk	953 fat Out of Pogis Irene 2d By Gretchen's Prince
11-24-08	Adelaide of Beechlands By Stoke Pogis of Prospect	15,572 milk	850 fat Out of Adelaide's Daughter
6-07-08	Financial Countess By Financial King	13,248 milk	795 fat Out of Financial Queen
8-30-07	Olive Dunn By Arthur Dunn	9,930 milk	672 fat Out of Olive O'Malley
1-31-07	Peer's Surprise By Mella Ann's Son By Lucy's Stoke Pogis	14,452 milk	634 fat Out of Signole's Maud By Brookside Victor Pogis To Ida's Rioter of St. Lambert
10-31-05	Emma's Rowena By Rowena's Duke To Rioter's Pride	10,284 milk	638 fat Out of Emma of Eauclaire By Mella Ann's Son
1-23-05	Magyarland's Temisia By Magyarland's Exile By Exile of St. Lambert	10,419 milk	638 fat Out of Gretesia's Temisia By Cretesia's Pogis To Stoke Pogis 3d
2-24-99	Dollie's Valentine By Oonan's Tormentor Pogis By Oonan's Tormentor By Tormentor	10,219 milk	579 fat Out of Dolly Fay By Torland's Seer By Ida's Lanisser By Ida's Stoke Pogis

GREAT HOLSTEIN-FRIESIANS

1. Neptune Jr. (0-0-0-0*0-0-0)
: DeKol 2d's Prince (0-0-0-0*0-0-0)
Paul DeKol (38-0-25-29*0-0-0)
: 1 Paul Mutual DeKol (3-0-8-6*0-0-0)
: Johanna Rue 2d's Paul DeKol (33-6-14-33*0-0-0)
: Mercedes Julip's Pietertje Paul (90-1-29-57*0-0-0)
: King Segis (87-2-27-65*0-0-0)
: : 1 King Segis Pontiac (169-14-88-43*0-2-3)
: : : 1 King Segis Pontiac Count (29-25-16-19*5-13-24)
: : : 2 King Segis Pontiac Emperor (13-4-10-8*0-0-2)
: : : 3 King Segis Pontiac Hero (7-6-0-3*0-0-5)
: : : 4 King Segis Pontiac Superior (30-8-0-5*0-2-6)
: : 2 King Segis 10th (29-16-4-8*1-3-11)
: : : 1 Segis Walker Matador (6-2-0-0*0-2-2)
: : : 2 Matador Segis Walker (46-15-1-4*1-7-12)
: : : 3 SEGIS PIETERTJE PROSPECT, 37,381 lbs. milk; 1,158 lbs. fat.
: 2 Mutual Friend's 3d Paul (17-0-22-18*0-0-0)
: DeKol 2d Mutual Paul (39-1-29-19*0-1-1)
: Monte Mutual DeKol (32-3-19-25*0-0-0)
: Fobes Tritomia Mutual DeKol (39-18-25-26*0-0-4)
: Oak DeKol 2d Homestead Fobes (12-5-5-8*0-0-2)
: Oak DeKol Ollie Homestead (19-10-6-7*0-1-5)
: Piebe Laura Ollie Homestead King (35-22-9-3*0-0-17)
: MAY WALKER OLLIE HOMESTEAD, 31,610 lbs. milk; 1,218 lbs. fat
: 3 DeKol 2d Paul DeKol (45-0-35-32*0-0-0)
Pietertje Hengerveld Paul DeKol (16-0-29-12*0-0-0)
Gem Pietertje Hengerveld Paul DeKol (13-0-14-7*0-0-0)
Sir Ormsby Hengerveld DeKol (69-20-21-50*0-1-6)
Sir Ormsby Skylark (22-7-3-8*1-6-6)
DUCHESS SKYLARK ORMSBY, 27,761 lbs. milk; 1,205 lbs. fat

2. Sir Henry of Maplewood (1-0-0-2*0-0-0)
Mechthilde Sir Henry of Maplewood (7-0-12-0*0-0-0)
: 1 Tirania's Sir Mechthilde (3-0-7-5*0-0-0)
: Sir Abbekerk (0-0-0*0*0-0-0)
: DeKol 2d Butter Boy (12-0-21-19*0-0-0)
: Hengerveld DeKol (116-9-66-85*0-1-5)
: Ormsby Korndyke Lad (40-19-6-13*4-15-19)
: 2 Empress Josephine 3d Sir Mechthilde (3-0-8-10*0-0-0)
: 1 Manor Josephine DeKol (6-0-5-4*0-0-0)
: Pontiac Korndyke (151-10-133-105*1-4-4)
: : 1 King of the Pontiacs (277-44-217-115*3-22-36)
: : 2 Rag Apple Korndyke (54-3-36-23*0-0-1)
: Homestead Superb (23-0-4-2*0-0-0)
: Homestead Superb Vale (3-0-0-0*0-1-6)
: 2 Sir Pietertje Josephine Mechthilde (3-0-2-4*0-0-0)
: Worthemall Sir Pietertje (4-0-3-1*0-0-0)
: Alta Posch's Son (12-1-19-12*0-0-1)
: Sir Pietertje Posch
: 1 Jemima family
: 2 Sir Alta Posch Beets
: Inka Sylvia Beets Posch
: May Echo Champion — MAY ECHO SYLVIA
: AGGASSIZ SEGIS MAY ECHO, 30,836 lbs. milk; 1,345 lbs. fat
: 3 Sir Mechthilde of Maplewood (2-0-3-2*0-0-0)
Mercedes Mechthilde Pietertje (8-1-12-11*0-0-1)
Jack Mercedes (6-1-3-7?0-0-1)
Sir Pietertje Ormsby Mercedes (72-61-38-25*3-21-30)
Sir Pietertje Ormsby Mercedes 37th, with twelve 1,000 lb. daughters

3. Netherland Prince (0-0-0-0*0-0-0)
: 1 Netherland Alban (1-0-3-5*0-0-0)
: DeKol 2d Netherland (22-6-21-28*0-0-0)
: Manor DeKol (34-0-22-28*0-0-0)
: DeKol 2d Butter Boy 3d (119-10-95-87*0-3-8)
: Albina Butter Boy (31-28-15*0-0-1)
: Virginia Korndyke Butter Boy (10-15-0-0*1-11)
: Virginia Korndyke Butter Boy (10-15-0-0*0-1-11)
: 2 Netherland Statesman (1-0-10-30*0-0-0)
Clothilde 3d's Netherland (1-0-3-6*0-0-0)
Maurice Clothilde (1-0-3-6*0-0-0)
Maurice Bonheur (3-0-3-6*0-0-0)
Sarcastic Lad (35-13-42-29*0-3-0)
: 1 Colantha Johanna Lad (134-23-106-72*1-4-19)
: 2 Johanna Aaggie Sarcastic Lad (18-0-25-28*0-0-0)
Homestead Girl DeKol Sarcastic Lad (107-22-45-65*1-4-14)
Star Farm Johanna Lad (14-12-3-6*0-0-7)

are either inbred or line bred to this one sire. The Jemimas are particularly famous for high production, generation after generation, and at one time the Jemimas had the highest and the third greatest world's records of production for three successive generations. It is also through this sire that we get the present world's record cow, Aggassiz Segis May Echo, whose production of 1,345 pounds of fat is the greatest production ever made by any cow of any breed. The sire of this wonderful individual, May Echo Champion, is a brother to the world's famous cow, May Echo Sylvia. We also find in this family the famous Sir Pietertje Ormsby Mercedes, and his great son, Sir Pietertje Ormsby Mercedes 37th, who has 12 daughters each with a record above 1,000 pounds of butter.

In the third section headed by Netherland Prince, we have such famous individuals as DeKol 2d Butter Boy 3d, Virginia Korndyke Butter Boy, and Star Farm Johanna Lad, the animals used at the college herd so sucessfully, and I believe that the real success of the V. P. I. herd is due to the concentration of the blood line of this family more than to any other cause.

In the successful breeding of any herd of cattle, it must be kept in mind that certain individuals, particularly certain blood lines or families, are capable of high production and transmitting desirable type. Certain other blood lines or families are not capable of transmitting either desirable production or type. Anyone breeding dairy cattle, or intending to start into the dairy business, should select animals that combine type with production, and that are preferably line bred, upon those famous individuals that have successfully produced both type and production.

VALUABLE DISCOVERIES MADE BY COW TESTING ASSOCIATIONS

J. C. McDOWELL — Dairy Husbandman, Dairy Division — U. S. Department of Agriculture

In the United States, 3 per cent of our dairy cattle are purebred. In Virginia, 1.8 per cent of the dairy cattle are purebred. In the United States, 25 per cent of the dairy bulls are purebred. In the United States, there are 23 dairy farms to one purebred dairy bull. In Virginia, there are 64 dairy farms to one purebred dairy bull. On July 1, 1922, there were in the United States 513 cow-testing associations and 190 bull associations. In cow-testing associations, Wisconsin led all the states with a total of 127. Virginia was 12th with a total of 12. In bull associations, Pennsylvania led all the states with a total of 27. Virginia was 26th with a total of only 1. In milk production, according to the last census, Virginia was about 900 pounds per year per cow below the average of the United States. In dairying, generally, Virginia seems to be somewhat below the general average of this country.

That ought not to be! That will not be the case in years to come! Virginia is as good a state as the sun shines on, and with enough attention to selection, feeding and breeding, Virginia can equal any dairy district in this old world in average production of milk and butterfat per cow. I had rather take my chances in the dairy business in Virginia where the winters are generally short and mild, than in those far, far northern districts where the

winters are always long and cold. I had rather take my chances in the dairy business in Virginia where the normal rainfall is abundant, than in those semi-arid regions of the west where it scarcely rains at all.

Everybody knows that profitable dairy cows must be comparatively large producers yet few people fully realize the remarkable rate at which profits advance as production increases. Figures obtained from the tabulation of the records of all the cows on test in 120 cow-testing associations show that as average butterfat production increases from 100 pounds to 150 pounds, the income over cost of feed advanced from $10 to $26, that is, an increase of 50 pounds in butter fat production gave an increased income over cost of feed of 160%.

The next fifty pounds increase in butter fat production advanced the income over cost of feed to $42; the next to $58, the next to $74, the next to $90, the next to $106, and the next to $122.

Briefly stated, as butter fat production increased from 100 pounds to 450 pounds the income over cost of feed advanced from $10 to $122, exactly $16 for every increase of 50 lbs. in butter fat production or in other words as butter fat production increased 4½ times the income over cost of feed advanced 12.2 times.

From the Rockingham and Augusta Virginia Cow Testing Associations for 1922-1923 we have the following figures:

Butter fat Pounds	Price per Pound	Income over Cost of feed
100	.64	$12
150	.65	36
200	.61	58
250	.61	78
300	.61	100
350	.59	116
400	.60	136

One cow in the last group produced more income over cost of feed than 11 cows in the first group.

A short time ago we tabulated one year's records of the Eastern Panhandle Cow-testing Association of West Virginia. We found that the herd that ate the most in dollars worth of feed per cow averaged highest in milk production, highest in butter fat production, highest in total income, and highest in income over cost of feed. We found the herd that ate the least in dollars worth of feed per cow averaged lowest in milk production, lowest in butter fat production, lowest in total income, and lowest in income over cost of feed. When the young lady clerk finished working on these figures and reported them to me she remarked, "I feel sorry for the poor cows that don't get enough to eat."

Would it not pay every dairyman to keep the kind of cows that he can well afford to feed?

Selling Feeds to the Cow

There is no better way to market the feeds grown on the farm than to feed them to a high producing herd of dairy cows. The cow takes corn silage, grain and clover hay, and converts them into a product for which there is always a ready sale. It is much easier to send the butter fat to the creamery

than to haul the hay to town. Yes, and in the long run it is generally much more profitable because that practice keeps the soil fertility at home. Instead of selling hay and grain that they may go to enrich the soil in some far distant state, or in a foreign country, the wise dairy farmer markets such products through high-producing dairy cows.

In selling feeds to dairy cows the farmer has a wide choice of markets; bad, good and very good. Few men discriminate closely enough between these markets. If a wheat buyer offers a cent or two a bushel more than other buyers he gets our wheat; if a wool buyer offers a half cent a pound more for our wool we sell our wool to him; but if one cow returns three dollars from a dollar's worth of feed and another only two, we scarcely notice it at all. Here we have a difference of a dollar every time each of these two cows consumes a dollar's worth of feed, and, frequently, within a year this difference is great enough to buy a hundred dollar Victory Bond. We believe much more attention would be given to a choice of cows if we would think of them as markets for our labor and for corn silage, concentrates and clover hay. Here is one place where the farmer has the market largely under his control.

If you sell feeds to dairy cows you have a constant market. If you sell feeds to high producing dairy cows you have a good and constant market. If you sell feeds to purebred, well bred, high producing dairy cows you have a double market; a market for calves and a market for milk. In dairying, the feed market is always exactly what you make it.

The few cow-testing association records we have from bull associations show the great advantage of using a good sire in our dairy herds. Of the 17 daughters of bull association bulls in the New Windsor, Maryland Bull Association 16 excelled the dams in production of butter fat. On an average the daughters produced 1,144 pounds more milk and 26.7% more butter fat than the average of their dams. That is quite a contrast to some figures we have from another district where there was neither a cow testing association nor a bull association. A scrub cow in that neighborhood produced in one year's time 146.8 pounds of butter fat. Her daughter sired by a scrub bull produced 126.3 pounds of butter fat and the granddaughter sired by the same scrub produced 99.7 pounds of butter fat in a year. Just exactly .7 of a pound more than was produced by California Gretel, a Toggenburg goat.

Scrub dairy cattle, in fact scrub livestock of any kind, can be supported profitably only in those districts where there is a combination of cheap land, cheap feed, cheap labor, and good markets, and I defy any living man to find any such district to-day. There are at least three varieties of scrubs; the scrub purebred, the low-producing grade, and just plain scrub. According to locality, scrubs are known as scrub, native, mixed, common, mongrel, and piney woods cattle. A scrub cow has four legs, two horns, a hide and a tail. That is about all there is to a scrub cow anyway except appetite.

There are several ways by which a dairy herd may be improved. The elimination of low producers increases average production, decreases total production, and usually increases net profits. Better feeding of the cows we now have increases average production, increases total production, and may increase net profits. The use of better sires increases average production, increases total production and nearly always increases net profits.

All dairy herd improvement due to better breeding tends to increase profits to the producer and to decrease costs to the consumer. It is one of the ways by which the world may become richer without decreasing the prosperity of any individual in it. Therefore, as I see it, the breeders of good purebred dairy cattle are among the world's greatest benefactors.

THE OUTLOOK FOR THE DAIRY INDUSTRY

STERLING SIMPSON, Senior Student in Agriculture, V. P. I.,
Blacksburg, Virginia

Mr. Chairman, Members of the Virginia State Dairymen's Association:

When the members of the Virginia Tech Dairy Club selected me as the member of the club to speak to you here on this occasion, I considered it a great honor. Now, that I am here with you and have learned more of your organization, I feel it a still greater honor to have a voice in this meeting. After much thought and deliberation over my subject, I have decided to discuss the Outlook for the Dairy Industry under the three following heads:

1. The main advantages of dairy farming over other types of farming.
2. Virginia as a dairy state.
3. Some of the more important things necessary for successful dairying.

Advantages of Dairy Farming

In considering the outlook for any industry, I think it well to get some idea of the advantages it has over other industries that are in competition with it. By doing this we can better judge whether the people that are now engaged in dairying are likely to contipue, or whether the number of those so engaged is likely to increase or decrease. It is of equal importance to see what our present conditions are here in Virginia. Iin order to look into the future we must know where we now stand and how we arrived here. Finally, before we can hope to make dairying what it should be we must understand clearly the factors that promote to success.

In this discussion it is not my purpose to make every thing that I say something you don't already know, because much that I shall say will be derived from things you have done. I shall only endeavor to bring before you some of the more imporatnt facts related to the dairy industry.

Dairy farming offers many advantages over other types of farming. Probably the greatest advantage the dairy farmer has is that he can easily improve his soil, which is a very important thing for Virginia farmers, because the soil is the basis of any farming system. Not only that, but the soil is the basis of all human activities, political, social, or religious. In a poor soil section we find poor, ignorant people and all other conditions likewise poor. On the other hand, in a fertile soil section we usually find other conditions better; better roads, churches, schools, and better people in general. It is from these sections we get the leaders of our state and nation. It used to be thought that the soil was the greatest asset the nation had and that it would never wear out. While we still recognize it as the greatest asset the nation has, we know it will become depleted of its plant food. In order to continue the farming process, we must handle our soil in such a way as to maintain

and increase its productiveness. There is no better farming system to produce such a result than dairying. First, dairying encourages the use of a crop rotation that contains leguminous crops. But the greatest improvement comes from the proper handling of the manure.

Value of Manure

The manure produced by dairy cows is usually of high quality, because of the nature of some of the feeds used. It is almost always above the average. An average ton of manure contains about 15 pounds of nitrogen, 5 pounds of acid phosphate, and 7 pounds of potash. At the present prices of these fertilizing materials, a ton of manure would be worth about $3.70. But from results obtained by experiments conducted at the Virginia Experiment Station and elsewhere throughout the U. S., it has been proved that a ton of manure is worth considerably more than the value of the actual plant food it contains, because of the fact that it tends to warm the soil, adds organic matter, helps to bring about the proper physical condition of the soil, and favors the growth of beneficial soil bacteria. It is hard to say what a ton of manure is worth, because its value depends on how badly your soil needs these things I have just named.

The plant food value and these other beneficial effects are greatly reduced when the manure is thrown out beside the barn in such a manner as simply to get it out of the way. The rain leaches out the plant food, and bacterial action destroys the organic matter. If this process continues for any length of time the manure will not be worth the time it takes to spread it on the land.

Distribution of Labor

Another very important advantage the dairy farmer has is that he can better diversify his farming system, and a more even distribution of labor is maintained throughout the year. This enables the dairyman to employ better laborers, because the men that you hire by the year are better than those that you hire by the day or month. The greatest amount of work for the dairy herd is necessary during the winter months when there is very little that can be done in connection with field crops. There is more feeding and cleaning needed about the barn at this time. It is the time when the dairyman should have the largest percentage of his herd in milk, because it is the time when milk is at the highest price. Also it is the time when the cow will reach her maximum production. The high point of labor on field crops is during the summer months when the herd is on grass and needs practically only to be milked. There are fewer calves to care for. The young heifers and dry cows are on grass and require none of the farmer's time. According to Dr. Warren, of Cornell University, in well managed dairies it requires about 150 hours work per cow per year. There is less work required from June to October inclusive than there is during the months of January, February, and March.

Income

While dairy farming helps the farmer to provide work throughout the year, it also enables him to maintain a more continuous and uniform income. In almost all other types of farming the farmer is paid for his work by seasons of the year and as a rule only once a year. In dairy farming he gets a

check once a month. That fact alone may contribute enough to his business to make the difference between success and failure. It seems to be human nature for a man to spend all the money he has as soon as he can. Many of us buy things that we have no need for when we get a little surplus money on hand, and when it comes to buying something that we need, we do not have any money. It has been said that anybody can make money, but the trouble is in saving it. The problem of saving is reduced to the minimum for the dairyman by giving him smaller sums to deal with at any one time. He never has more money than he knows what to do with, but he always has some money when he needs it.

There are other advantages that might be discussed, such as the utilization of waste land, and coarse rough feeds that cannot be profitably marketed otherwise. It is a fact that the dairy cow will produce more wholesome digestible human food than will any other animal from a given amount of feed. But we have not time to discuss those advantages here. The whole idea is that when other types of agriculture may not pay so well, the dairy farmer has some special advantages by which he may prosper.

Virginia as a Dairy State

Considering Virginia as a dairy state, we find her well represented among the three leading dairy breeds and a few of the fourth, the Ayrshire. Reference to the census reports will show that the dairy cows in Virginia have been increasing at the rate of about 16,000 per year. It is also interesting to note that the quality of the dairy cows has been increasing rapidly as well as the number. The scrubs are being replaced by good grades and purebreds. In 1910 there were 120 Guernseys in Virginia. In 1920 there were about 1,700, an annual increase of about 175 cattle. I was unable to get the same data for Jerseys and Holsteins, but we know that in point of numbers these two breeds are ahead of the Guernseys at the present time. There are now over 500,000 dairy cows in the state, about 10,000 of which are purebreds. During a period of 10 years the average yearly production per cow has been raised about 600 pounds. It now stands above 2,500. The state record, however, is 23,439.5 pounds of milk in 365 days. There are quite a number of other cows in the state that are not very far behind the record. With some cows producing so much and the state average so much lower, it is evident that there are some very poor cows yet scattered over the state. There is a job for somebody to drive them across the border line.

The annual production of milk in Virginia is about 110,942,000 gallons. This allows about 48 gallons of milk per year for each individual. From these figures it may be seen that if all the dairy products that we consume were taken as whole milk, each person would have an allowance of about one glass per day. The allowance is even less than that because Washington City buys about 38,000 gallons daily, the most of which comes from northern Virginia. Of course, some of this comes back to the state to be consumed as butter, cheese, or ice cream, but by no means all of it. As well as I could find out the other dairy exports and imports of the state about balance. There are many of us that consume very much more than a glass of milk per day. So it is evident that there are vast numbers of people somewhere in the state that hardly know what milk and other dairy products are. They are as a

rule the weaker undernourished ones and no doubt those most active in propagating diseases. The population of the state is increasing at the rate of about 12 per cent in a period of ten years. The increase in the total amount of milk produced during that same period was 5.5 per cent, which is less than half the increase in the population. Here is a problem for the dairyman to solve; to teach the people the unsurpassed value of milk in all forms as a human food and induce them to use more of it. The value of the products derived from the dairy cow is no doubt the thing that will do most to keep the dairy business profitable. That is what keeps any business alive. It doesn't matter how fine a factory you build, if it does not turn out a useful product, its business will not continue. The dairy cow is a factory that produces a product that cannot be equalled by that of any other factory, because there is no substitute for milk.

In this connection, let us note that Virginia is exceptionally well situated for a dairy state. We are far enough south for the problem of wintering to be reduced to a minimum. Cows may be allowed to sleep under sheds all winter, an arrangement which insures better health of the herd. We usually have good markets for the products turned out. Also the states farther south offer opportunity for a good market to stimulate the future development of the dairy industry in Virginia. They themselves will probably never go into dairying very extensively on account of their lack of sufficient grass and because of the fact that they can make more money growing cotton, and fruits and vegetables for the early market. Furthermore, we are close to the cotton fields and can get cottonseed meal with very much less freight to pay than the northern dairymen. I am sure you all know what cottonseed meal means to the producing ability of a dairy cow. The Virginia dairymen certainly has the advantage of being able to supply the southern market, as it is developed, very much cheaper than the northern dairyman.

Important Elements for Success in Dairying

There are many important factors that contribute to success or failure in the dairy business. If one should attempt to point out the most important factor it would be like trying to say which is the most important link in a chain. There are a number of things mutually essential. A man must first be able to produce crops economically. If he cannot grow crops so that they will pay a profit he will not be able to feed them profitably. We have got to have good cows of good breeding; proper methods of breeding and selection must be followed. It is very necessary that the herd be properly cared for and protected against diseases. Sound judgment must be exercised in feeding and in the selection of feeds. Special methods are required in handling and marketing the products produced. Good sound business methods and cooperation are very necessary in the whole process. But these are things that we can read about every day in farm papers. Futhermore, they are always subjects of discussion at such meetings as this. To my mind the thing that is of fundamental importance in successful dairying is something that we don't see or hear very much about — that is proper training or education. That is the factor that I want to lay most emphasis on here and now.

A man might have any number of the best cows in the world, with ideal feeds and conditions for caring for them; but unless he had some previous training in dairying, he would be doomed to failure. It used to be the cus-

tom for farmers to send the brightest, most intelligent-looking of their sons to the city to become preachers, doctors, and lawyers, or to follow some other high-toned profession; and leave the less fortunate ones at home to become agriculturists. Such a plan may have been all right in the past, but now that day has gone. I have often heard it said that a man does not need any education to follow the plow handles or to milk a cow; but the plow handles as we used to know them have been replaced by modern machinery that requires skill and intelligence to operate, and there is something more to dairying than milking a cow and, even that requires skill.

The prosperity of almost any state or nation depends on the training she gives her agriculturists. One of the chief causes that brought Russia where she is to-day was a slump in her agriculture. One of the chief causes that enabled Germany to make the fight she did in the World War was the attention she gave to her agriculture. The thing that helped us most to win the war so quickly was our agriculture, and no branch of it did more than dairying.

It is not my purpose to try to induce you to persuade your sons or any one else to follow the occupation of agriculture. But if you have sons back at home that expect to stay on the farm, it is your duty to give them a fair chance. You need not worry about leaving them so much money, so many acres of land, or so many cows. You should seek to train them to be more able to solve the problems of their occupation. If they have not then the ability to acquire these other things, they would not have the ability to handle them without the training.

For training in agriculture and especially in Virginia dairying, V. P. I. is surpassed by no other institution. The purpose of the course in Dairy Husbandry is to prepare men to become breeders of purebred dairy cattle, dairy farm managers, inspectors of dairy products and dairy establishments, to enter commercial work in the manufacture of butter and cheese, or to do extension work in dairying. The course is not limited to strictly dairy subjects. It includes the fundamental subjects that deal with the production of crops and the problems of the soil, as well as those more closely related to dairying.

Everything is taught in as practical a way as possible, which is a very desirable feature of the course. It doesn't matter how much of a theoretical education a man has, if he cannot put it to practice it is of no use to him. At V. P. I. you don't learn how to test milk by reading a book, but you learn by actually doing it. You don't learn the characteristics of a dairy cow that go with high production from what some one tells you, but you learn by seeing them manifested in a high producing cow. You don't learn the type of cow that it takes to become grand champion in the show ring by reading about her, but you learn by being made to judge that cow yourself. Also you learn the effect of an application of manure by being allowed to observe crops growing where manure has and has not been applied. There are any number of other things that might be named, but I think these are sufficient To show you that when a man completes a course at V. P. I. in Dairy Husbandry he has not learned a lot of theory that he doesn't know how to use.

The three leading dairy breeds of cattle are maintained at V. P. I., which is not the case at many of the other well-known agricultural colleges. Cor-

nell University, for instance, only has one breed. The V. P. I. Holstein-Freisian herd is one that deserves special comment. Judged both from show winning and from production it is the outstanding herd owned by any college or experiment station in the world. Of course, it is true that an experiment station in Canada has recently made a world's record for butter production, but it has not the average production for the entire herd or the show winnings that V. P. I. has. The average production for the V. P. I. Holstein herd is 763 pounds of butter per year, animals of all ages being included.

From 1913 until recently Buckeye Pauline DeKol II held the world's record for both butter and milk production for colleges and experiment stations. From that same date till this year, she held the same record over all ages and all breeds south of the Mason and Dixon Line. Her record is 1,155.5 pounds of butter and 20,784 pounds of milk in 365 days. Mr. F. S. Walker, of Woodberry Forest, has recently had a cow to complete a record of 23,439.5 pounds of milk, which takes the milk record of the South away from V. P. I., but it is still in Virginia. Also V. P. I. still holds it for butter production. The first three cows in Virginia to produce over 20,000 pounds of milk were bred, developed, and owned by V. P. I. Of course, now, you may say these cows are not going to teach you anything, but I am sure you all know enough about making dairy records to know that they don't grow on trees. Wherever you find high records you find somebody that knows how to breed, feed, and care for dairy cows.

Moreover, the college authorities are intensely interested in developing as fine herds of Jersey and Guernsey cows as of Holstein. With the work that is being done throughout the state by the Jersey and Guernsey breeders, and the high quality and many other highly desirable features of the two breeds, there is no reason why they should not have better representation at the State Agricultural College. During the next few years it is to be expected that this improvement will be made, and that we shall be justly proud of our V. P. I. dairy cattle of all three breeds.

In conclusion I may say that I have given only a mere outline of the outlook for the dairy industry. There are other phases of the subject that might be discussed. More could be said about the points that have been taken up. But I trust that you have caught the idea that the dairy farmer has some special advantages, by which, if properly used, he may prosper while some other farmers fail. Moreover, Virginia has made wonderful progress in dairying. She is the mother of cows and records that we can look to with pride, though the state as a whole does not realize the unquestionable value of milk as a human food. Finally, in order to do successful dairying and maintain the high standing already won, you must give your sons a certain amount of the proper training, and for such education no place equals V. P. I.

STATE RECORD COW
Virginia Cow Testing Association for 1922

SADIE

A grade Holstein cow, five years old, owned by Mr. Ben Middleton, of Herndon, Virginia, a member of the Fairfax County Cow Testing Association No. 1.

Record for 1922: (record completed Dec. 1, 1922)

Milk (lbs.)	18,490
Butter Fat (lbs.)	729.6
Butter (lbs.)	912.0

BUSINESS SESSION

MR. J. V. NICHOLS, Vice-President — Presiding,
Purcellville, Virginia

The business session of the Virginia State Dairymen's Association convened at 9.30 A. M.

There were about 150 members of the association present.

REPORT OF THE PRESIDENT

F. S. WALKER, Woodberry Forest, Virginia

In reviewing the activities of the association for the past year we always get very excited and very promising. Naturally we would do this when we meet together only once each year. We say we're going to work next year to get a large increase in membership and sometimes we get real busy working for that purpose. For the past year we do show a slight increase in membership, but we do not have the backing of the locals. This may have been the fault of the officers. I hoped we would be able to get a paid secretary who could go around and help organize locals. We should all keep in mind the need of having a paid secretary and work toward getting a large enough appropriation from the legislature to employ a good man, so that our association can grow and develop the dairy industry in Virginia.

Regardless of the handicap which the association has been laboring under by not having a full time paid secretary, progress has been made and the association is going forward. In the matter of assistance to dairymen's organizations throughout the state our secretary reports as follows:

There were fifteen local dairymen's associations organized or assisted.

Assistance was given in the organization of the Valley of Virginia Milk Producers' Association which now has a membership of over 600 dairymen.

The re-organization committee of the Maryland-Virginia M. P. A. was also assisted.

In view of the inability of the association to meet the many demands been made for assistance we are brought face to face with the need of the association for more finances with which to develop our organization in the future. At the present time the state appropriates only $500.00 yearly to the association. From our small membership we received an income of only $190.00 for the past year. These are our only sources of income and the total is hardly enough to pay the expenses of the convention and publishing our annual report. We have little or nothing left for developing new fields of activity. It seems to me then, that every officer and member of the association should use his influence in trying to secure a larger appropriation from the next legislature.

There is one new activity which the association has started during the past year. This is the Virginia Registry of Production, which is a co-operative project with the Virginia Cow Testing Associations under the supervision of the Dairy Extension Office of the V. P. I. Extension Service. More details and facts of this service will be presented you by our secretary.

In closing these few remarks regarding the work of our association during the past year, let me impress upon every member that there is a large field

of service in Virginia for this association; there is much dairy legislation to be enacted for the benefit of the industry and the people of the state, but if we are going to progress as an association we must have the help and support of every member so that our membership can be increased, a large appropriation secured, needed legislation enacted and the service of the association extended to all parts of Virginia.

REPORT OF THE SECRETARY-TREASURER

F. A. BUCHANAN, Blacksburg, Virginia

Testing Association the board of directors at their meeting in August, 1922, agreed to co-operate in establishing in Virginia a "Register of Production." This work is being conducted under the supervision of the V. P. I. Extension Service, Dairy Extension Office, Blacksburg, Virginia. The need for this service and object for establishing the Register of Production is briefly outlined below, further information, rules and regulations of the register can be secured from the secretary or the V. P. I. Dairy Extension Office.

VIRGINIA REGISTER OF PRODUCTION

Need for the Register

Every Virginia dairy cow that is worth keeping should have a record of production, because it is only by the keeping of such records that the true worth of the cow can be known. According to the 1920 census the average cow in Virginia produced only 2,500 pounds (292 gallons) of milk in one year, with less than 100 pounds of butter fat. This fact should arouse dairymen to the need in Virginia for dairy cows of higher average production.

The Virginia Cow Testing Associations are organized for the purpose of keeping records of production on more of the dairy cows in this state. By means of these records the "boarder" and unprofitable cows can be eliminated from the herds. The average production of the herd can be increased, bringing to Virginia dairy farmers larger profits from fewer cows.

At present there are over 5,000 cows on test in Virginia Cow Testing Associations. Hundreds of these cows ought to produce a pound of fat a day, during their lactation period. Cows that can make 800 or more pounds of fat in ten months deserve recognition, because they are far above the average. When such a record is made these cows should no longer be classed with the ordinary unimproved cow, but should be in a class of their own and their record known to all the world.

The Virginia Register of Production was established in order that the records of cows making 300 pounds of fat or more in ten months will be recognized. Not only will the cows be honored by this recognition but the owners will receive the credit for this accomplishment; since it is the good feeding, breeding and management given to such cows that enable them to qualify for the Register of Production.

Object

1. To give wide publicity to the records made by cows in Virginia Cow Testing Associations.

2. To secure better breeding and better feeding methods and better care for Virginia dairy cows.

3. To increase the purchase and sale of cows on the basis of yearly production, and of calves and purebred bulls on the basis of the yearly production of their dams.

4. To emphasize the necessity of judging a dairy bull according to the work of his daughters.

5. To establish recognized yearly records for purebred and grade cows when these cows would otherwise be without a record.

At the present time there are 169 cows applying for entry in the Virginia Registry of Production. These cows are owned by 48 members of Virginia Cow Testing Associations. The first records will be completed about August 1, 1923.

Our president, Mr. Walker, has outlined the activities of the association and has suggested three main activities for which we can all work to accomplish during the coming year.

1. Increase of membership.
2. Secure, if possible, a larger appropriation for the association.
3. Secure much needed legislation for the benefit of the industry in Virginia.

FINANCIAL REPORT

January 1, 1922, to December 31, 1922

Receipts

Balance	Income on hand Jan. 1, 1922		$320.33
Convention — 1922			
	Program Advertising	$351.00	
	Exhibit Space	187.00	
	Farm Butter Contest	45.75	
		$583.75	583.75
Membership — 1922			192.00
Appropriation — State Treasury			500.00
Miscellaneous			20.00
	Total		$1,616.08

Disbursements

Convention:			
	Program — Speakers	$295.85	
	Publicity	34.09	
	Printing	308.40	
	Awards — Farm Butter Contest	62.50	
		$700.84	700.84
Office:			
	Postage	$182.20	
	Office Help	83.62	
	Printing	382.86	
	Annual Report — Reported	117.25	
	Telegrams	14.33	
		$780.26	780.26
Miscellaneous			90.22
	Total		$1,571.32
	Balance on hand, Jan. 1, 1923		44.76
			$1,616.08

ELECTION OF OFFICERS

The following directors' terms expired at this convention:

W. A. Houston, Fairfield, Virginia
C. N. Beck, Charlottesville, Virginia
J. C. Courter, Jetersville, Virginia
E. B. Foote, Milton, Virginia

Mr. F. C. Baldwin, of Fredericksburg, Virginia, resigned from the Board of Directors by letter. This letter of resignation was read before the association.

The following names were nominated and duly elected as members of the Board of Directors for a term of three years as provided for in by-laws of the association:

Dr. J. S. Andrews, Orange, Virginia
C. N. Beck, Charlottesville, Virginia
A. F. Howard, Charlottesville, Virginia
R. L. Harrison, Herndon, Virginia

Mr. M. D. Rhodes, of Broadway, Virginia, was nominated and elected to succeed Mr. F. C. Baldwin, resigned.

RESOLUTIONS ADOPTED

Increased Appropriation

Whereas: The Virginia State Dairymen's Association is rendering a most valuable service to the dairy industry of Virginia by the distribution of information relating to the economical production of milk; the holding of an annual convention of Virginia dairymen, and the assistance rendered to various producers' organizations by the secretary.

Whereas: The present annual appropriation of ($500.00) five hundred dollars to the association from the state treasury is inadequate to meet the needs of the association for the development of its service to the industry and the people of the state.

Be it Resolved: That the association ask the Virginia State Legislature which convenes for its next regular session in the spring of 1924, to increase the appropriation of the association from $500 to $5,000. This increase to be used for the purpose of employing a field man for the association and extending the services of the association to the people of Virginia.

Legislation Against "Filled Milk"

1. Resolution: Whereas, the manufacture and sale of so-called filled milk or skimmed milk, to which has been added cocoanut oils, has reached very large proportions in this country; and

Whereas, it has been scientifically proved that this product is deficient in those vital substances contained in whole milk fat which are essential for the proper growth and vitality of children; and

Whereas, it has been shown by various special investigations of advertising and retailing practices of vendors of various brands of "Filled Milk" that many consumers are induced to believe that such product is in fact the same as condensed or evaporated milk, or that it is "just as good as milk;" and

Whereas, the continued sale of this "bogus" milk, or "filled milk" has resulted in its being fed to children in place of real milk and has become a menace to the health and well-being of large numbers of the growing generation; and

Whereas, the manufacture and sale of the produce has thus become inimical to the public welfare and the interest of agriculture of this state and other states of this country;

Therefore, Be it Resolved:

1. That the Virginia State Dairymen's Association in its annual meeting assembled on March 9, 1923, take such action as is necessary to present before the several representatives and senators at the next regualr session of the State Legislature, a bill to provide such laws as will prevent the sale and manufacture of so-called filled milk, i. e. skimmed milk modified by the addition of any extravenous or foreign fats.

COMMITTEE ON RESOLUTIONS

Geo. L. Oliver, Richmond, Virginia.
W. L. Kirby, Richmond, Virginia
C. S. Stahl, Lynchburg, Virginia
J. A. Loving, Richmond, Virginia
J. C. Courter, Amelia, Virginia

LOCATION AND DISTRIBUTION OF PROJECTS IN DAIRYING

1923

■ - Active Cow Testing Association

▨ - Cow Testing Association being Organized

● - Active Cooperative Dairy Bull Association

◍ - Cooperative Dairy Bull Association being Organized

▲ - Other Dairy Projects Completed or Under Way

EXHIBIT I