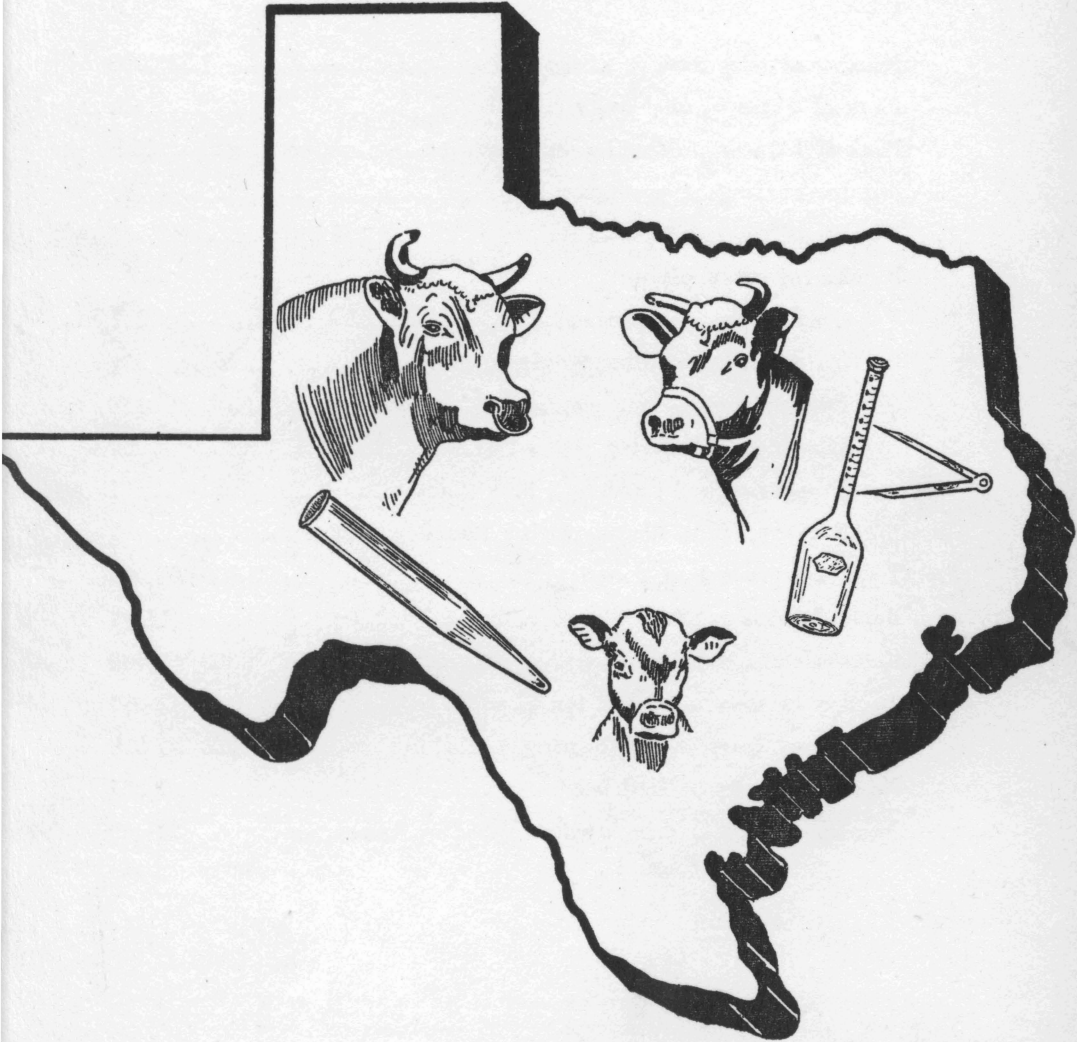


Dairy Handbook

for Texas



Issued by
The Agricultural Extension Service
The Texas A. & M. College System and
The United States Department of Agriculture
G. G. Gibson, Director, College Station, Texas

1950 TEXAS DAIRY FACTS

The information below is based on the best figures available for 1950.

Number of dairy cows -----	1,283,000
Rank of Texas in total dairy cows -----	4th
Rank of Texas in production per cow -----	45th
Number of Grade A producers -----	8,787
Number of Ungraded producers -----	12,668
Number of dairy plants:	
Grade A processing plants -----	212
Ice cream manufacturing plants -----	244
Butter manufacturing plants -----	118
Cheese manufacturing plants -----	23
Evaporated and Condensed Milk Plants -----	7
Powdered Milk Manufacturing Plants -----	5
Total milk production, pounds -----	3,800,000,000
Rank of Texas in total milk production -----	11th
Value of total milk produced -----	\$200,000,000
Number of cows on DHIA test -----	14,044
Number of cows on AR test -----	518
Number of cows on HIR test -----	2,367
Number of cows bred in Artificial Breeding Associations -----	21,000

Dairy Handbook for Texas

By
RICHARD E. BURLERSON
A. M. MEEKMA
Extension Dairy Husbandmen
Texas A. and M. College System

There are several agricultural groups or agencies in Texas working with dairy programs and making recommendations to dairymen. To develop a sound dairy program it is of utmost importance that these recommendations be uniform and supported by research. It is the purpose of this DAIRY HANDBOOK to present such recommendations in a brief outline form with the hope that it will be of help to all individuals or groups working with the dairy industry. Most of the references listed may be obtained through the local County Agricultural Agent.

PROBLEMS

The following problems were listed by County Agricultural Agents in their Annual Plans of Work:

- Low milk production per cow
- Lack of herd replacements
- Poor pastures
- Lack of high quality hay and good silage
- Poor feeding and management methods
- Lack of herd records
- Need for good breeding program
- Control of external and internal parasites
- High cost of milk production
- Poor sanitation
- Control of Bang's Disease and Mastitis
- Marketing

The above problems can best be solved through a program of BALANCED DAIRYING—feeding, breeding, management, herd records, and marketing.

I. FEEDING

A. Pastures

1. Most dairymen know that pasture is the source of cheapest feed nutrients, but many do not realize that dairy cows need improved pastures even more than some other classes of livestock. Cows in milk should not be required to graze

more than two or three hours a day. Time and energy spent in searching for grass over poor pastures are reflected in reduced milk production.

2. Here are a couple of points we can use in selling dairymen on the value of improved pasture:

a. 18 vs 2.5

The dairy cow produces 139 pounds of 4% milk or 18 pounds of edible solids from each 100 pounds of digestible nutrients. A beef steer produces 2.5 pounds of edible solids from each 100 pounds of digestible nutrients. *Pastures on the best land* is justified for dairy cows because of this high return of 7 to 1 in favor of the dairy cow.

b. Pasture is the best source of low cost nutrients.

Cost of 100 lbs. Digestible Nutrients From Various Sources

Improved Pastures	\$0.40
Silage	1.40
Alfalfa Hay	3.00
Concentrate Mix	5.40

(Based on pasture cost of production figures, silage valued at \$5.00 per ton, alfalfa hay costing \$30.00 per ton, and concentrate mix costing \$3.50 per 100 lbs.)

3. Good pastures will stimulate milk production more than any other feed.
4. Pastures are more efficient and produce more tonnage of grazing when a good rotation-grazing program is followed. Never overgraze pastures.
5. Stress supplemental pastures to supplement perennial pastures; one acre of sudan in summer and one acre of small grain in winter per cow; consider grass-legume combinations.
6. Follow local recommendations for pasture improvement practices.

B. Silage

1. Keep reminding dairymen that:
 - a. Silage is needed as a substitute for pastures when they go out.
 - b. Silage is the second cheapest source of feed nutrients.
2. Recommend putting up a minimum of 3 tons of silage per cow.
3. Plant adapted crops. Follow local recommendations for varieties and fertilizer applications. Crops suited for silage

- include corn, grain sorghums, sweet sorghums, grasses and legumes.
4. Here is a key for silage yields per acre (insert local yields):
 - a. Bottom land: Corn—5 to 6 tons (to tons)
Grain sorghums—10 to 12 tons (to tons)
 - b. Upland: Corn—3 tons (to tons)
Grain sorghums—5 to 6 tons (to tons)
 5. Legume and grass silage
 - a. Wilt method. Decrease moisture content to 65% by allowing to wilt several hours in the field. Need mower, slide delivery rake, and field harvester with windrow attachment.
 - b. Adding Blackstrap molasses
 - (1) Grasses—30 lbs. per ton
 - (2) Legumes—50 lbs. per ton
 - c. Adding ground grain
 - (1) Grasses—100 lbs. corn or other grain per ton
 - (2) Legumes—150 lbs. corn or other grain per ton
 6. Stage of cutting
 - a. Corn—dough stage (first dents)
 - b. Grain sorghums—soft dough stage
 - c. Grasses—before bloom
 - d. Legumes—early bloom
 - e. Grass and legume combination—consider legume
 7. Encourage partner or neighborhood ownership of silage equipment.
 8. Arrangements for feeding silage conveniently
 - a. Use troughs, cleaning daily to remove old or moldy and uneaten silage.
 - b. Best to feed after milking
 - c. Use tubs or pickup to move silage from silo to troughs.
 9. Types of silos
 - a. Upright—recommended for a permanent program
 - b. Trench—may be of concrete to make permanent storage facilities
 - c. Box—when lumber is readily available
 - d. Fence—emergency and temporary use
 - e. Others

C. Hay

1. Remember: Hay is the third best source of low cost nutrients.
2. Recommend putting up a minimum of 1 ton per cow with silage and 2 tons without.

3. Grow legumes when possible; otherwise, other adapted varieties.
4. Here is a key to hay yields (insert local yields):
 - a. Bottom land: Johnson Grass—4 to 5 tons (to tons)
Sown sorghums—5 to 6 tons (to tons)
Legumes—4 to 5 tons (to tons)
 - b. Upland: Johnson Grass—2 to 3 tons (to tons)
Sown sorghums—3 to 4 tons (to tons)
Legumes—1 to 2 tons (to tons)
5. Cut at proper stage
 - a. Grass—before heading
 - b. Sorghums—bloom stage
 - c. Legumes—early bloom or before
6. The best hay feeding program for milking cows is to feed all the hay cows will clean up the year round. This is one of the best ways to fully utilize roughages.

D. Concentrates

1. Balance protein of grain mix with quality of roughages (C-238).
2. When cows are on full feed of roughages (pasture, hay, and silage), feed grain according to production (1 lb. grain to 3 to 4 lbs. milk).
3. When grains are available, encourage home mixing of concentrates. Here is a typical ration:
 - 400 pounds of ground milo grains
 - 200 pounds of ground oats
 - 100 pounds of wheat bran
 - 150 pounds of cottonseed meal
 - 8½ pounds of salt
 - 8½ pounds of limestone or oyster shell flour

The above mixture contains 16% protein, 6.7% fiber, and 73% total digestible nutrients and cost about \$3.00 per 100 lbs. in 1950.
4. Feed mineral mixture (one part salt and two parts steamed bone meal) and granulated salt free-choice in mineral box protected from weather.
5. With commercial feeds, encourage the study of feed tags. Dairy cattle can digest some of the fiber in feeds, but as a general rule, we can say that as the fiber content is increased by 1%, the feeding value declines 2½%. For example, a farmer is offered two 18% protein dairy feeds. One feed contains 10% fiber while the other contains 15%. Multiplying the 5% difference by 2½, we find that there is ap-

proximately 12½% difference in feeding value. If the 10% fiber feed sells for \$4.00 a sack, the 15% fiber feed is worth only \$3.50 or 12½% less.

6. Here are safe analyses for concentrate mixtures:
Protein—16 to 18 percent
Fiber—Not more than 10 to 12 percent
TDN—65 to 75 percent (NFE + P + (Fat × 2¼) × .85 = Est. TDN)

E. References on Feeding

1. Publications
 - a. B-69, Feeding and Care of the Dairy Herd
 - b. B-186, Silage for the Dairy Herd
 - c. C-238, Balanced Dairy Feeding
 - d. C-286, A Forage Program for the Dairy Herd
 - e. B-168, Clovers for Texas Pastures
 - f. C-216, Mowing Pastures
 - g. C-178, Annual Lespedezas
 - h. FB-1820, Silos—Types and Construction
 - i. FB-1626, Feeding Dairy Cows
 - j. Morrison, *Feeds and Feeding*
 - k. 1939 Yearbook of Agriculture, *Food and Life*
 - l. 1943-47 Yearbook of Agriculture, *Science in Farming*
 - m. 1948 Yearbook of Agriculture, *Grass*
2. Visual Aids
 - a. 2 x 2 slides, Producing and Using Silage
 - b. 16 mm film, Green Acres
 - c. 16 mm film, Hay
 - d. 16 mm film, Hay is What you Make It
 - e. 16 mm film, Twelve Months Green
3. Blueprints
 - a. No. 345, Cattle Hay Rack
 - b. No. 356, Mineral Trough

II. BREEDING

A. Selecting Herd Sires

1. First choice: a good proved bull with five or more dam-daughter comparisons
2. Second choice: a son of the above bull out of a good record dam with tested progeny
3. Third choice: a purebred bull with the best ancestors possible

4. Care of bulls
 - a. Keep bull in pen or pasture. Do not let run with herd.
 - b. Provide safe breeding facilities and practice controlled breeding.

B. Artificial Breeding

Counties with 8,000 or 10,000 dairy cows are good prospects for an artificial breeding program.

1. Types of programs: within herds, between herds, and artificial breeding associations
2. An artificial breeding association must be sound financially.
3. Needs active and interested members
4. Requires records and reports

C. References on Breeding

1. Publications
 - a. L-58, Artificial Insemination of Dairy Cattle
 - b. 1950 List of Sires Proved in Dairy Herd Improvement Associations
 - c. Breed magazines
 - d. D-317, Breeding and Calving Record
 - e. Rules and Regulations Governing Artificial Insemination of Purebred Dairy Cattle
2. Visual Aids
 - a. 2 x 2 slides, Artificial Breeding
 - b. 16 mm film, Artificial Insemination of Dairy Cattle
 - c. 16 mm film, In The Beginning

III. MANAGEMENT

A. Plenty of Clean, Fresh, Cool Water All the Time for all Dairy Cattle

B. Parasite Control

1. External parasites
 2. Internal parasites
- Follow recommendations of entomologists and veterinarians.

C. The Calf Raising Program

1. Methods of raising calves
 - a. Limited whole milk schedule
 - b. Skim milk schedule

- c. Milk substitutes schedule
- d. Nurse cow
- e. Feeding procedure
 - (1) First 3 or 4 days on mother's colostrum
 - (2) First 2 to 3 months on milk or milk substitute program
 - (a) Feed whole milk from low testing cows first 2 or 3 weeks.
 - (b) In changing from whole milk to skim milk or milk substitutes, make change gradually. Feed at rate of 1 pound to each 8 to 10 pounds body weight. Decrease gradually at end of period.
 - (3) Start grain in second week, feeding to 10 months of age.
 - (4) Start hay in second week.
 - (5) Heifers over 10 months of age on good pasture and hay, and supplemental grain, if necessary
 - (6) Feed heavy springer heifers same as dry cows.
 - (7) Keep clean, fresh water available at all times.
 - (8) Provide mineral box.
 - (9) On commercial milk substitutes, the best policy is always to follow manufacturer's directions.
 - (10) Always make changes in feeding procedure gradually.

2. Sanitation

- a. Clean, dry quarters
- b. Control flies
- c. Rotate pastures
- d. Treat navel cord with iodine (or other antiseptic) at birth

3. Control of external and internal parasites

4. Calf scours

- a. Regularity and care in feeding
- b. Sanitation and disinfection
- c. Treatment and isolation of sick calves

5. Grouping calves by age or size to insure adequate development

- a. If 30 or more calves are raised annually:
 - (1) Birth to 2 months. Individual stalls and wire floors are preferred for first 3 or 4 weeks.
 - (2) 3 to 4 months. Do not allow calves to suck each other.
 - (3) 5 to 6 months. Provide supplemental grain feeding as calves go on pasture.
 - (4) 7 to 10 months. Hold weak calves for extra feeding.

- b. If less than 30 calves are raised annually:
 - (1) Same as above
 - (2) 3 to 6 months. Watch smaller calves to see that they get plenty of feed and to prevent sucking.
 - (3) 7 to 10 months. Hold weak calves for extra feeding.
- c. Separate heifers and bulls at 6 months of age.
- d. Heifers 10 months, except weak calves, up to bred heifers
- e. Heavy springing heifers
- 6. Vaccination of calves
 - a. Blackleg
 - b. Bang's Disease
 - c. Other specific cases
- 7. Calf sheds
- 8. Dehorning Calves, tattooing or marking for identification, and clipping extra teats

D. Care of Dry Cow

- 1. Drying-up Cows
 - a. If giving 10 pounds or less milk per day, quit milking.
 - b. If more than 10 pounds per day, remove feed and keep in dry lot until dry. (Give non-legume hay and limit water.)
- 2. Should have 6 weeks to 2 months minimum rest period
- 3. Dry cow ration should be good pasture, hay, and grain as needed. (Minerals same as for milking cow.)
- 4. Two weeks before calving, put cow on freshening ration (using laxative ration such as wheat bran, or a good home-mix or commercial dry and freshening ration), good pasture, and good quality hay, preferably non-legume. Feed same for 10 days to two weeks after freshening, then change gradually to dairy ration.
- 5. In feeding the freshening cow, the effort is made to condition and strengthen the cow for calving but not to encourage a heavy milk flow just before or immediately after calving.

E. Labor Utilization

- 1. Labor schedule should be arranged not to exceed a ten-hour day.
- 2. Labor-saving devices to make work more convenient and more easily completed
- 3. Provide all labor a regular day off at intervals.

F. Housing

1. Milking barn (Have local inspector approve location and barn plan.)
2. Loafing shelter
3. Calf shed
4. Bull pen and shed
5. Isolated shelter for sick animals
6. All shelter buildings should have adequate space—80 square feet for grown animals, 30 square feet for heifers.
7. Sanitary buildings
8. Well-ventilated buildings
9. Well-arranged, well-drained lots and pens

G. Dehorn All Dairy Animals, Including Bulls

H. Keep Animals Free of Disease by Health Testing, Isolating Sick Animals, etc.

I. Utilize Manure in Soil Rebuilding Program

J. Good Care of Cows

1. Regularity of milking, feeding, handling, and grazing
2. Good handling
 - a. A quiet, comfortable environment at milking time
 - b. Same attendants
 - c. Do not run cows or excite them with dogs or horses.

K. Quality Milk Control

1. Milking Equipment

- a. Use only seamless type milk utensils, tin or stainless steel.
- b. Proper cleaning of milking utensils
 - (1) Rinse in cool water, promptly after use.
 - (2) Use soapless washing powder in lukewarm water.
 - (3) Scrub utensils with brush.
 - (4) Rinse in hot water.
 - (5) Do not dry with cloth but place on suitable rack and drain.
 - (6) Before using, rinse in chlorine solution.
- c. When milking machine is used:
 - (1) Practice rapid milking procedure.

- (2) Follow recommended instructions in the operation of the milking machine.
 - (3) Follow manufacturer's directions in care and cleaning of the milking machine.
2. Milking Attendants Should be:
 - a. Attired in clean clothing
 - b. In good health—free of contagious disease
 - c. Interested in doing job properly
 3. Milk Cooling Facilities
 - a. Rapid cooling of milk is most important in keeping good quality milk.
 - b. When mechanical cooling facilities are used, cool 36 to 40 degrees Fahrenheit where Grade A standard is to be maintained.
 - c. When water is used in cooling ungraded milk, use fresh water from well and cool as low as possible.
 - d. To keep good quality milk, temperature should be maintained below 50° F.
 4. Wash udders of cows with hot chlorine solution one minute before milking to clean the udder and to induce milk "let-down".
 5. Clipping the udder and belly of cows aids in keeping them clean more easily.
 6. Provide hand-washing facilities to control spread of mastitis and to produce clean milk.
 7. Mastitis control
 - a. Milk infected cows last.
 - b. Do not use infected milk.
 - c. Sell cows with serious or chronic infection.
 - d. Use strip cup daily.
 - e. Treat infected cows early.
 - f. Use extra milker unit to allow time to soak while two units are in use.
 8. Cooperate with milk quality control fieldmen and milk inspectors.

L. Planning the Dairy Operation

1. Determining the land use program, acreages for grazing crops, etc.
2. Economic aspects and financing the dairy program
3. Keeping a dairy farm accounting system
 - a. Inventory: land, buildings, livestock, machinery, and equipment, supplies, feed, etc.
 - b. Income: milk sales, cattle sales, other incomes

- c. Expenses: feed purchases, labor hired, cattle purchases
 - d. Loans, mortgages, accounts payable, interest, taxes, insurance
 - e. Annual summary of business
4. Measure the efficiency of the dairy operation, herd record utilization, comparing unit income and expense.

M. Maintenance, Repair, and Utilization of Machinery and Equipment

- 1. Manure spreader
- 2. Mowing machine
- 3. Silage equipment

N. References on Management

1. Publications

- a. B-178, Raising Dairy Calves
- b. C-284, Developing Dairy Heifers
- c. C-290, A Milking Procedure For The Dairy Herd
- d. B-59, Dairy Barn Plans
- e. FB-1412, Care and Management of Dairy Bulls
- f. Dairy Magazines
- g. FB-2017, Clean Milk Production
- h. FB-1422, Udder Diseases of Dairy Cows
- i. FB-1470, Care and Management of Dairy Cows
- j. FB-1871, Brucellosis of Cattle
- k. L-77, Anaplasmosis of Cattle
- l. B-158, External Parasites of Livestock and Their Control
- m. C-287, Control of Stomach Worms and Liver Flukes in Cattle and Sheep
- n. L-82, Wheat Poisoning of Cattle
- o. L-136 Control of Ticks Infesting Cattle
- p. L-137 Control of Flies Affecting Livestock
- q. C-292 Mastitis and Its Control
- r. 1942 Yearbook of Agriculture, *Keeping Livestock Healthy*

2. Visual Aids

- a. 2 x 2 slides, Fitting and Showing Dairy Heifers
- b. 2 x 2 slides, Judging Dairy Cattle
- c. 2 x 2 slides, Raising Dairy Calves
- d. 2 x 2 slides, A Milking Procedure for The Dairy Herd
- e. 16 mm film, Battling Brucellosis
- f. 16 mm film, Practical Production of Grade A Milk
- g. 16 mm film, Dairying As It Should Be Done
- h. 16 mm film, Quality Milk Production
- i. 16 mm film, The Milky Way Out
- j. 16 mm film, Greener Pastures (Quality Milk)

3. Blueprints
 - a. No. 366, Calf Barn
 - b. No. 373, Hay Storage and Loafing Shed
 - c. Dairy Barn Plans

IV. HERD RECORDS

A. System of Testing

1. Private herd tests
2. Owner-Sampler tests
3. Dairy Herd Improvement Associations (DHIA)
4. Official testing (registered cows only)

B. When to Encourage Each System

1. DHIA—75 to 100 dairy units in county
2. All others—one or more dairymen

C. Information Made Available Through Records Kept

1. DHIA—milk and butterfat production, value of product, daily and monthly feed amounts, cost of feed, value of product above or below feed cost (on individual cow and on herd basis)
2. Official—milk and butterfat production
3. Private and owner-sampler—as much information as desired

D. Analyzing and Using Records

1. Feeding program
2. Culling program
3. Breeding program
4. Cost of milk production

E. References on Herd Records

1. Publications
 - a. FB-1974, The Dairy Herd Improvement Association Program
 - b. PDCA, Unified Rules for Official Testing
2. Visual Aids
 - a. 2 x 2 slides, DHIA Records and Their Use
 - b. 16 mm film, John Martin and Son

V. MARKETING

A. Milk Production and Supply

1. Encourage breeding for fall production and to maintain year-round level of production.

2. Produce quality milk in maintaining quality standards of milk; farm cooling facilities; transportation to plant.
3. Milk surplus problem. Using surplus milk in the dairy industry

B. Types of Milk Markets

1. Grade A whole milk
2. Ungraded whole milk
3. Other, such as cream, butter, or cheese

C. Utilization of Milk

D. Comparative Cost of Production

1. Farmer's cost of milk production
2. Farmer's handling cost factors
3. Relationship of milk prices and cost of milk production
4. Economic dairy units, balance in operation, efficiency

E. References on Marketing

1. Breed and dairy magazines
2. South Texas Producers' Association
77 Harvard St.
Houston, Texas
3. North Texas Producers' Association
P. O. Box 11
Arlington, Texas
4. Other producers' associations
5. Dairy Products Institute of Texas
503 Scarbrough Building
Austin, Texas
6. American Dairy Association of Texas
503 Scarbrough Building
Austin, Texas
7. State Health Department
Austin, Texas

VI. METHODS OF PUTTING OVER A DAIRY PROGRAM

A. The dairy program should be well-planned and meetings should be held when dairymen can attend.

1. County dairy organizations
 - a. One dairy organization representing all dairy activities
 - b. Committee representing particular dairy program phase: DHIA, ABA, 4-H, FFA

- c. Dairy leaders to assist in planning county dairy program
- 2. 4-H and/or FFA Dairy Program
 - a. Organization: 5 members minimum
 - b. Membership: 4-H Club, FFA, dairy farmers, others interested
 - c. Activities: tours, training meetings, achievement days, shows
 - d. Demonstrations: dairy calf to dairy herd
 - e. 4-H and FFA dairy programs and contests
 - (1) Local program and contest
 - (2) District program and contest
 - (3) State program and contest
 - (4) Dairy cattle judging teams
 - (5) Dairy demonstration teams
 - (6) Breed association programs
 - (7) Sears program
 - (8) Other programs: service clubs, banks, dairymen
- 3. Field tours
 - a. Farm herd inspection, silo inspection, pasture inspection, use of barnyard manure
 - b. Use part of time for brief, but effective, subject matter discussions or talks.
 - (1) Distribute mimeographed material, bulletins.
 - (2) Take pictures or slides.
 - (3) Have questions and discussion.
 - (4) Let farmers tell story.
- 4. Feeding and management schools
 - a. Outline a specific program. Don't try to cover everything.
 - b. Break down into a series of meetings.
 - c. Use local materials.
 - d. Be sure information is correct.
 - e. Adjust discussions to solve existing problems.
 - f. Hold meetings on dairy farms, in dairy barn, or in the pasture.
- 5. Dairy Days
 - a. Hold only if wanted by dairymen, and if a definite program can be accomplished.
 - b. Confine subject matter to:
 - (1) Classification of animals
 - (2) Selecting animals, culling
 - (3) Herd records and high records of animals present
 - (4) Judging contest
 - c. Combine Dairy Day with County Fair (if interest lags).
 - (1) Have a special day set aside for Dairy Day.
 - (2) Always use standard classification system.

6. Dairymen-businessmen meetings and luncheons
 - a. At least one such get-together per year
 - b. In these meetings make information general, interesting, and informative.
7. Annual dairy organization meetings
 - a. Compare last year's county production with present. See what has been accomplished.
 - b. Check on goals accomplished during year.
 - c. Plan new goals for next year.
 - d. Invite groups in county interested in dairying; milk plant personnel and other agricultural workers.
8. Dairy Clinics
 - a. A series of short training meetings scheduled at close regular intervals. Meetings from one and one-half to two hours in length
 - b. To give more intensive training to dairymen and others interested in specific program
 - c. Use local talent, fieldmen, or local dairymen to present talks and discussions.
9. Dairy short courses
 - a. A one or two day program outlined to cover desired phases of dairy program
 - b. Plan an interesting, informative, and specifically scheduled program that will provide the results desired.
 - c. Use local talent, fieldmen, or local dairymen, in the program.
10. Dairy cattle shows and fairs
 - a. Shows and fairs have a place in the regular dairy program.
 - b. 4-H Club and FFA members may plan to exhibit.
 - c. Breeders who will show may desire information.
11. Individual farm visits
12. Use of slides, photographs, film strips, charts, etc., in office for personal office contacts. Show dairymen to answer his questions.
13. Committee conferences
 - a. Consult dairy committee for procedure on program planned.
 - b. Discuss subject matter and program planning.
14. Illustrative publications, mimeographed letters
15. Publicity
 - a. Newspapers, feature articles for farm magazines
 - b. Radio
16. Circular letters

Cooperative Extension Work in Agriculture and Home Economics, The Texas
A. & M. College System and United States Department of Agriculture
Cooperating. Distributed in furtherance of the Acts of Congress of May 8
and June 30, 1914.
5M-651