

DETERMINING THE SUBJECT MATTER CONTENT OF AN ADULT
EDUCATION PROGRAM FOR THE IMPROVEMENT OF THE BEEF CATTLE
INDUSTRY OF TREGO COUNTY

by

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INTRODUCTION

The idea of a program of adult education for the improvement of the beef cattle industry of Trego county developed from the work of a local planning committee which cooperated with the Wakeeney chapter of Future Farmers of America in making a long-time program for the agricultural improvement of the community. In 1941 this committee made an extended investigation of ways and means of increasing their prosperity and of making their community a better place in which to live.

In the booklet¹ containing their report, was included a recommendation that the average farm business be so organized that 45 to 80 per cent of the gross income would be derived from the sale of livestock and livestock products. One suggestion for reaching this goal was to winter more beef calves in order to utilize otherwise unmarketable roughage.

After this report was distributed the local committee began the task of persuading farmers to adopt the new livestock program. Two things were desired in the improvement of calf-wintering: higher efficiency through better methods and an expansion of the business through the wintering of more calves. To accomplish these ends, it was decided to prepare an adult education program.

¹Plans for agricultural progress in Trego county. Wakeeney, Kansas. Trego Community High School. 12 p. 1941. (Mimeo.)

REVIEW OF THE LITERATURE

Approved Practices in Wintering Calves

During the last two decades there has been a tendency to market fat cattle at an earlier age, and consequently the attention of students of the beef cattle industry has been focused on the writing of literature which emphasizes the care and feeding of calves. This has been especially true at the Fort Hays branch of the Kansas Agricultural Experiment Station, where a wealth of good research on calf-wintering has been reported. In books and pamphlets have been presented good descriptions of the various phases of beef production, authentic discussions of the comparative economy of good quality and poor quality calves, implications of the trends in market prices, recommendations as to the most efficient methods of feeding, and suggestions for the elimination of losses due to injuries and disease.

Cow Herds vs Stockers. The cattle enterprise has become more specialized, with different localities handling the various phases. Snapp (20), a careful observer of the Kansas Agricultural Experiment Station, described six different phases: calf production, growing stockers, fattening for market, baby-beef production, handling dual-purpose cattle, and raising pure-bred cattle. He pointed out that stockers are handled only by farmers who have much cheap roughage, while cow herds require vast areas of cheap grazing land.

Snapp's definition of a stocker was, "a young animal that is being fed and cared for in such way that growth rather than an improvement in condition may be realized". He mentioned two kinds of stock cattle, heifers to be kept for breeding purposes and individuals of both sexes intended for the market. As to age there are advantages in favor of both calves and yearlings. Call, Aicher and McCampbell (7) found that calves made better gains per acre and per ton of roughage than those made by yearlings, but other experiments (6) showed that there was a larger seasonal advance in price in the case of the yearlings.

Effects of Quality. One might well choose yearlings for wintering or calves for both wintering and summer grazing, but in either case good quality is essential. There are important objections (20) to a common grade of stock cattle: they lack uniformity in rate of gain; they are unthrifty and show twice as great death loss as do better grades of cattle; and they have a bad effect on the morale of the owner. Snapp reported an Ohio experiment in which choice steers made a profit of \$10.43 per steer more than common steers.

Source of Calves. Stocker calves of good quality are not usually obtainable in a community where there are few excellent beef herds. It is better to go to the range areas and choose directly from a good herd (20). In purchasing from distant localities, cooperative effort would save much of the transportation expense.

Time to Buy -- Time to Sell. In the fall the amount of roughage available is known and one can buy cattle without risk due to uncertainty of the feed supply. Eggert² gave another reason for fall purchase of stockers; the price in October and November is the lowest of all the year. On the other hand the price is highest about May 1, making spring the logical time to dispose of cattle which have been fed for six months on otherwise unmarketable roughage.

Size of Feed Lot. It is well to let the native grass pasture rest during the winter. If stockers are allowed the run of the pasture, they wear down the grass and are no better for having had the greater space. Experiments (17) have shown that a small but well drained enclosure results in much greater gains than a larger area.

Better Utilization of Feed. Equal gain per steer was obtained (17) by the feeding of sweet sorghums as dry fodder and as silage, but the gain per ton of feed and per acre of sorghum was 96 per cent greater in the case of the silage. Kafir silage excelled kafir bundle fodder by 120 per cent.

Protein Supplement Essential. The most important consideration in a wintering ration is the protein content. One-half pound of additional gain per head per day can be expected as a result of adding one pound of cottonseed meal to a

²Eggert, R. J. Livestock seasonal price movement -- Kansas City. Dept. Agr. Econ., Kans. State Col. of Agr. and Appl. Sci. 2 p. 1940. (Mimeo.)

protein-deficient ration (12). The kind of protein supplement is not so important. McCampbell and Aicher (18) found that one pound of cottonseed meal, two pounds of wheat bran, and three pounds of ground alfalfa hay are about equal as protein supplements, -- the choice depending on the current market price of each.

Grain added to the wintering ration was found (1) to cause much less marked effect on gains than that due to the addition of a protein supplement. Since 4.66 pounds of grain per head per day increased the gain only .54 pounds, very little advantage was seen for including grain in the wintering ration. In 1941 McCampbell and Aicher (17) summarized the results obtained at the Kansas Agricultural Experiment Station and recommended the following ration for the wintering of stockers:

All the sorghum silage, bundle sorghum, ground bundle sorghum, sorghum hay or sudan hay they will eat plus one pound of cottonseed meal, linseed meal, soybean oil meal, or corn gluten meal; or two pounds of bran; or four pounds of alfalfa hay per day.

Calcium Requirements. While they did not include ground limestone in the ration, they did refer to an experiment (8) in which calves having limestone added to the ration made almost eight pounds more gain in the course of a 122-day period than calves having the same ration without the limestone. They found that adequate amounts of calcium are supplied by including three pounds of alfalfa with the ration, and that roughages furnish more lime than is supplied by grains.

Wheat and Grass Pasture Poisoning. While calves fed on roughage showed less additional gain resulting from the calcium supplement than was noticed in the case of grain-fed calves (17), stockers that ran on wheat pasture presented a new problem in the form of a wheat-poisoning hazard. Bruce Taylor³, Assistant Professor of Animal Husbandry at Oklahoma Agricultural and Mechanical College, found that this trouble could be eliminated by mixing ground limestone with the salt and thus compelling all cattle to consume an adequate amount of calcium. He also found that one or more pounds of dry roughage fed to each individual every day would protect cattle from wheat poisoning. His recommendation was that both the calcium and the dry roughage should be used for double safety. Taylor remarked that penning the cattle at night would induce each animal to consume sufficient dry roughage. He considered a constant supply of drinking water another important factor in the prevention of wheat poisoning.

Elimination of Other Hazards. A considerable economic loss results from diseases, poor technique in castrating, and injuries due to horns. Snapp (20) has called attention to several advantages of dehorning calves: lower shed room requirements, less disturbance in the feed lot, and 50 to 75 cents per hundred weight higher market price due to the relative freedom of hornless steers from injuries caused by horns. Washburn (22) has reported

³Taylor, Bruce R. Correspondence with C. W. McCampbell, Kans. State Col. of Agr. and Appl. Sci. Nov. 3, 1936.

that hemorrhagic septicemia or "shipping fever" could be prevented by vaccination, ten days before shipment with aggressin or bacterin prepared for the purpose. He said visibly sick calves frequently could be cured by the administration of immune serum. Snapp (20) mentioned several advantages of castration of stock calves: more symmetrical development; improvement in texture, tenderness and flavor of beef; and the improvement of the temperament of the animal.

The suggestions found in the literature should be accepted for use in Trego county. Most of the cattle experiments reported were conducted at the Fort Hays Branch of the Kansas Agricultural Experiment Station, which is less than 20 miles from the eastern boundary of Trego county. Results obtained at Hays could likely be duplicated on the average Trego county farm.

Approved Procedures in Adult Education

The literature on adult education has proved to be a prolific source of ideas on the advisability and the practicability of teaching adults, as well as on the recommended procedures for use in a program of adult education. By making a study of 389 master farmers from 28 states, Hamer (13) found that the most successful farmers of the United States have attended an average of 14 meetings a year for the purpose of adult education in agriculture. Several different students of the adult field (2, 11, 14, 15) have determined independent-

ly by means of extensive investigations that adult schools are very effective in causing farmers to adopt approved practices. Bryant (5) concluded that it pays to teach farmers on the job and reported that one of the subjects in which he found the most effective adult education was livestock production.

After finding that adults had been given credit for adult work in some Kansas schools, Chase (9) concluded that some type of certificate should be awarded. He also observed that most night schools were held two nights a week from seven till nine during three months of winter.

Fleener (11) saw a very wholesome effect of the adult school on the day school and on school and community relationships.

While Chase recommended the lecture method of instruction and the open forum for use in teaching adults, Brimmer (3) said adult schools would be improved if more discussion were provoked. McClarren and Marx (19, 16) found demonstrations effective in adult education and McClarren recommended better training of instructors for adult classes, better use of conference procedure, more use of community surveys, and supplementary practice.

After considering such teaching methods and devices as open forum, informal discussion, panel discussion, symposium, demonstration, movies and slides, charts, and mimeographed information sheets, a graduate class in Adult Education in Evening Schools at Kansas State College of Agriculture and

Applied Science thought of the idea of substituting a dramatization of subject matter for the less attractive lecture method. One member of the class (4) tried out the idea in a ten-lesson series of meetings at Webster, Kansas, and found that a combination of dramatic play with panel discussion, informal discussion and the use of colored charts was practicable, effective and well received.

MATERIALS AND METHODS

To learn the conditions commonly found on typical Trego county farms and to ascertain the nature of practices used on these farms, sources of existing data pertinent to the subject were investigated before new data were gathered. While some data (21) were already available from census reports and from the records of tax assessors, adequate data concerning Trego county were not obtainable without a systematic survey. Preliminary to the making of such a survey, the question arose as to the identity of the farmers who winter calves in that county. Discussion with farm leaders of the county indicated that nearly all the farmers do so.

A preliminary check of the accuracy of this answer was made by asking 350 bonafide farm operators of the county if they had, during the previous year, wintered one or more calves; 349 had done so. The opportunity to make this check was offered by the township elections held by the Agricultural Adjustment Administration in seven different community

centers. The author attended all these elections and obtained the information mentioned. Finally, the supposition that all the farmers winter stocker calves was rechecked by the survey itself, which indicated that 98 per cent winter one or more calves each year.

As it was not possible to survey the county by interviewing every farmer, a list of 50 representative farmers, chosen at random, was prepared. To obtain this list, names were drawn by chance from a box containing the names of all the Trego county farmers. The location of the homes of each of the 50 farmers, thus chosen, was marked on a map which had been obtained from the county register of deeds (Appendix). With the help of this map, it was possible to drive to the home of each of these men.

Each farmer was interviewed personally for the collection of exact data on his beef production program (See specially prepared blank, Appendix). All the farmers who were asked for information cooperated wholeheartedly. After the blank had been filled out, the farmer usually suggested that an inspection be made of his beef business. Occasionally he offered suggestions for the improvement of the Trego county beef industry. A few took that opportunity to ask questions in regard to their individual problems.

In the survey, facts concerning the following subjects were obtained; general farm organization, acreage of crops and pastures, numbers of livestock, purchase and sale of livestock, equipment on hand for beef production, ration used

without wheat pasture, ration used with wheat pasture, processing of feeds, means used to eliminate hazards to the health of cattle, number and causes of death losses, amount of veterinary fees paid for cattle, and farmers' education and experience. After these data were tabulated, an effort was made to interpret them and to compare them with data from experiment station records.

On the basis of data from the literature, a standard of excellence was prepared to represent, as nearly as possible, the situations and practices found to be desirable. Dr. C. W. McCampbell and Dr. A. D. Weber of the Department of Animal Husbandry were consulted as authorities, and the Kansas Agricultural Experiment Station results were drawn on for ideas concerning approved practices in wintering calves. The standard as prepared was put into the form of a crops-and-livestock budget for the organization of a typical Trego county farm. Thus it became possible to make comparisons between the farm organization actually used by the Trego county farmers and organizations based on recommended practices. In comparing the economic aspects of the standard and of the budgets for various other possible combinations of enterprises, standard figures⁴ from long-term averages were used.

The data, thus secured, afforded opportunity to discover

⁴Hodges, J. A. and Pine, W. H. Standards for making a farm budget. Dept. of Agr. Econ., Kans. Agr. Expt. Sta. 10 p. 1937. (Mimeo.)

a few educational needs of Trego county farmers, relative to the beef cattle enterprise. The nature of these needs was determined by judging present Trego county situations and practices in the light of experiment station data, recommendations found in the literature and a study of comparative budgets.

After the educational needs of the farmers were determined, an investigation was made of the literature to see if adult education would likely be effective in causing farmers to make the necessary changes in their practices. A study was made of methods which have been used in adult education and a list of guiding principles was formulated for use in teaching farmers.

FINDINGS

General Data Concerning Trego County

In 1940 Trego county had a population of 5,816, the number having followed a downward trend since the peak of 1934, when dust storms occurred. The population of Wakeeney, the county seat, however, had increased slowly to a peak in 1940. The valuation of the county was rated in 1940 at \$9,564,839 (21).

The entire area of the county, about 576,640 acres, was originally in native grass. The acreage tilled for field

crops, particularly wheat, increased to a peak in 1930⁵ while the area in grass declined. Since 1934 several thousand acres have been left idle in the hope of restoring it to native grass, with the result that the 1940 census showed an actual increase in the area of pasture land in the county.

The number of beef cattle increased steadily until 1934, when feed shortage caused the number to decline sharply from 32,431 in 1934 to 9,890 in 1938. By 1940 the number was back up to 12,140 (21).

Besides supporting the beef cattle, the 1940 area of native grass, 243,000 acres, had to pasture 4,550 dairy cows, 1,750 horses and mules and 440 sheep. Considering the fact that this pasture area included some waste land, the 1940 ratio of 14 acres (21) was not too much to allow per livestock unit. The carrying capacity of the grass had been overtaxed by the pre-dust-storm droves of cattle which denuded the prairies, and Trego county farmers learned the folly of over-grazing. If in the future they leave sufficient land cover to prevent wind erosion, the number of cattle cannot be further increased except by other-than-grazing phases of the business.

The office of the Agricultural Adjustment Administration⁶ in Trego county gave 850 as the total number of farm operators

⁵Brown, J. Oscar. Beef cattle program for Trego county, Kansas. Unpublished term paper. 21 p. 1941.

⁶Information obtained by personal interview with Charles Connor, Agricultural Adjustment Administration, WaKeeney, Kansas.

in the county. This study indicated that 38 per cent of these were farm owners, 30 per cent were part-owners and 32 per cent were renters (Table 1).

Table 1. Distribution of farms in Trego county according to size and state of tenancy.

| Size group: (Acres) | : No. : : farms : : in : : survey | : Percentage : : of all farms : | : Median : : size : : (Acres) : | : Operated by (Percentage) | | |
|------------------------|--|------------------------------------|---------------------------------------|----------------------------|-----------------------|------------|
| | | | | : Owner : | : Part : : owner : | : Renter : |
| 895 - 2115 | 12 | 24 | 1400 | 10 | 12 | 2 |
| 500 - 820 | 13 | 26 | 640 | 8 | 12 | 6 |
| 400 - 490 | 14 | 28 | 480 | 10 | 6 | 12 |
| 160 - 320 | 11 | 22 | 320 | 10 | -- | 12 |

Information relative to acreage of crops and numbers of livestock has been tabulated (Table 2) from the survey data, on a number-per-farm basis. From the distribution of farms according to size were selected four different typical farm sizes: 1400 acres, 640 acres, 480 acres, and 320 acres -- the median of each size-group being used to represent the group. The farms were almost equally distributed among the four size-groups. Only two per cent were over 2000 acres and only four per cent were under 200 acres (Table 1). By computation on the basis of survey data shown in Table 1, the total area of the county could be determined, with an error of only about two per cent.

Crops and Livestock

The survey of 50 farms indicated that the large-farm group had pasture land to the extent of 55 per cent of the area. In the group of second largest farms, 42 per cent of the land was in native grass. The two small-farm groups had only about one-third of the area of each farm in native grass pasture. The number of feed-crop acres per farm was about twice as large in the 1400-acre group as was found in the case of the other groups, but in the other three groups there was little variation in the acreage of feed crops. The variation in size of farms was due principally to differences in acreage of pasture, cash crops and idle land. A livestock industry dependent on feed crops could be handled on about the same scope in one size-group as in another, while an industry depending on pasture would be seriously limited in the case of the smaller farms. These facts would tend to favor the stocker phase rather than the cow-herd phase of the beef business in Trego county (Table 2).

The forage crop acreage per livestock unit was about equal on all sizes of farms, approximately one acre per livestock unit. Overgrazing of pastures was indicated in the case of the two smaller-farm groups where only five to seven acres of grass were available per livestock unit, as compared with nine to twelve in the larger-farm groups.

Table 2. ' Crops and livestock in Trego county.

| Crops | :Size of farms -- median of group | | | |
|---|-----------------------------------|---------|---------|--------|
| | : 1400 A.: | 640 A.: | 480 A.: | 320 A. |
| | Mean no. acres | | | |
| Native grass hay | 7.3 | 7.3 | 1.6 | -- |
| Native grass pasture | 752. | 276. | 169. | 102. |
| Waste land | 10. | 9. | 5. | 7. |
| Farmstead | 5. | 7. | 5. | 4. |
| Total crop land | 593. | 388. | 277. | 183. |
| Alfalfa | -- | 1.2 | .4 | 1.8 |
| Grain sorghums | 29.2 | 14.2 | 10.8 | 7.3 |
| Forage sorghums | 53.3 | 16.9 | 16.6 | 13.0 |
| Sowed can and other hay | 16. | 12. | 2. | 7. |
| Corn | 6.3 | 4.2 | 5.9 | 7.9 |
| Barley | 43. | 31.6 | 23.8 | 22.5 |
| Oats | 5.8 | 8.6 | 8.9 | 2.7 |
| Wheat | 329.8 | 215.5 | 151.6 | 88.9 |
| Idle or fallow land | 101. | 84. | 58. | 17. |
| Average a. feed per farm | 154.0 | 89.1 | 68.7 | 62.6 |
| Forage crop a. per livestock unit ----- | 1.0 | 1.0 | .8 | 1.1 |
| Feed grain acres per livestock unit ----- | 1.3 | 1.9 | 2.0 | 2.0 |
| Pasture a. per livestock unit | 11.5 | 8.9 | 6.9 | 5.0 |

| Livestock | Mean no. animals per farm | | | |
|----------------------------|---------------------------|------|------|------|
| Horses and mules | 3.0 | 1.8 | 2.1 | 1.8 |
| Cows milked | 6.8 | 5.8 | 7.0 | 6.3 |
| Beef cows | 27.9 | 7.1 | 5.1 | 3.9 |
| Beef calves under 6 months | 20.5 | 11.4 | 6.1 | 8.3 |
| Yearling steers. | 6.3 | 3.3 | 3.9 | 1.4 |
| Yearling heifers | 11.3 | 4.6 | 2.6 | 1.7 |
| Two-year-old steers | 3.3 | 3.2 | .6 | -- |
| Two-year-old heifers | 2.0 | 1.0 | 1.1 | .9 |
| Bulls | 1.0 | .7 | .6 | .4 |
| Sows and gilts | 2.0 | 1.5 | 3.5 | .8 |
| Sheep | 3.3 | 3.0 | .6 | -- |
| Hens | 113. | 86. | 95. | 64. |
| Young chicks | 200. | 205. | 227. | 167. |
| Other poultry | 16.5 | 12.2 | 9.9 | 18.5 |
| Livestock units per farm | 66.3 | 31.2 | 24.5 | 20.3 |
| Calves wintered per farm | 24.8 | 8.4 | 7.1 | 5.1 |

Calf-Wintering Program

On the average, only about ten calves per farm were wintered in Trego county. Many of those were stockers only in the sense that they were heifers kept for replacement.

Sources of Calves. While a few farmers said they purchased calves, 76 per cent of them raised all the calves that they handled. The local sales ring, a new and apparently growing agency, was given as a source of calves by seven per cent of the farmers. While a few of them purchased calves in the fall, which is the best time, it was revealed that almost six times as many sold calves on the low market of the fall months, instead of buying additional stockers at that time for the purpose of wintering them and selling on the crest of the market about May 1. Whether the calves were raised or purchased at the local sales ring, the quality was more often medium or common than good or choice.

Grade of Calves Wintered. The grades of calves wintered, as shown in Table 3, indicated that the cattle of the county

Table 3. Grade of calves wintered.
(Percentage of farms)

| Choice or fancy selected ----- | 18 |
|--------------------------------|----|
| Good ----- | 26 |
| Medium ----- | 38 |
| Common ----- | 18 |

were barely average in quality and therefore would bring only an average market price.

Breed of calves wintered. The cattle on the farms surveyed were too often found to be crossbreds or scrubs, although a few excellent herds were noted. The better herds were usually Herefords, Shorthorns or Angus cattle. Some of the Shorthorns were good dual-purpose stock and some were of beef type.

Table 4. Method of marketing.
(Percentage of farms)

| | |
|-----------------------------------|----|
| Shipped by rail or by truck ----- | 14 |
| Sold at public sales ring ----- | 46 |
| Sold at private sale ----- | 34 |
| Made no sales during the year --- | 6 |

Method of Marketing. The method of marketing was largely through the local sales ring. Since more farmers sell calves than buy them in the county, there is evidence that outside buyers are exporting calves from the county. A more desirable situation would be for Trego county to import stockers. Those who made no sales were holding their stock because of a prospect of higher prices due to temporary market trends caused by war conditions. (Table 4).

Equipment. Fortunately beef cattle do not require elaborate equipment. Besides an open shed, available on most farms, little shelter is needed. Too few windbreaks (Table 5) were observed. More should be provided by planting trees on the north side of the barn yard. In a few instances, good natural windbreaks were available in the form of steep embankments.

Table 5. Equipment (Percentage of farms having items listed).

| Kind of equipment: | All farms: | Type of farm according to median of number of acres | | | |
|--------------------|------------|---|---------|---------|---------|
| | | 1400 A.: | 640 A.: | 480 A.: | 320 A.: |
| Barn or shed | 96 | 92 | 100 | 100 | 90 |
| Windbreak | 20 | 33 | 31 | -- | 18 |
| Silo (Any type) | 16 | 17 | 31 | 7 | 9 |
| Grinder or mill | 26 | 33 | 39 | 7 | 27 |
| Feed rack | 48 | 50 | 47 | 49 | 46 |
| Feed bunk | 42 | 42 | 54 | 35 | 37 |
| Loading chute | 2 | -- | -- | -- | 9 |
| Dehorning chute | 12 | 33 | 14 | -- | -- |

The most noticeable deficiency in equipment was found to be the common lack of silos for the safe storage and better utilization of roughage.

Feeding Practices in Wintering Calves. More than half the farmers fed an average of 3.37 pounds of grain per calf per day. While this is not always necessary when a protein-rich supplement is supplied, it would be necessary in the absence of a more economical protein supplement. The more disturbing discoveries were that only 20 per cent used a satisfactory protein supplement in the ration, only eight per cent supplied ground limestone, only eight per cent fed alfalfa, and about one-third of the farmers had lost an average of about four head of cattle each, in one pasture season, from a largely preventable hazard -- wheat pasture poisoning and grass poisoning. While most of the animals lost were cows rather than calves, the losses have had a marked economic effect on the cost of calves produced in Trego county for the wintering program (Table 6).

Table 6. Feeding practices in wintering calves (Percentage of all farms).

| | |
|--|----|
| Included a protein supplement in the wintering ration ----- | 20 |
| Supplied ground limestone ----- | 8 |
| Supplied mixed minerals ----- | 16 |
| Supplied salt ----- | 88 |
| Fed alfalfa ----- | 8 |
| Fed silage ----- | 14 |
| Fed bundle fodder ----- | 78 |
| Fed hay ----- | 4 |
| Fed straw (Wheat, barley or oats straw) ----- | 40 |
| Fed ground roughage ----- | 16 |
| Fed grain when not on wheat pasture ----- | 56 |
| Fed grain but failed to grind small grains for cattle ----- | 24 |
| Continued feeding grain when calves went on wheat pasture -- | 22 |
| Diminished grain feed when calves went on wheat pasture ---- | 6 |
| Withheld grain whenever calves were on good wheat pasture -- | 26 |
| Fed dry feed in morning before turning on wheat p. daily --- | 36 |
| Merely offered dry feed while calves were on wheat pasture - | 30 |
| Left on wheat pasture day and night during pasture season -- | 20 |
| Lost from one to 20 head due to wheat poisoning (One yr.) -- | 32 |
| Lost from one to 20 head due to grass poisoning (One yr.) -- | 4 |
| Had death losses due to some other reason ----- | 8 |

Only 40 per cent of the farmers made adequate use of wheat, oats, and barley straw in the cattle ration. The roughage produced by the present acreage of feed crops would feed almost twice the present number of cattle if stored and supplied in the form of silage and supplemented with dry feed in the form of straw, always available in a feed rack.

Miscellaneous Practices. Some farmers did not dehorn calves (Table 7) and a few sold before castrating them. Half of the farm operators neglected to vaccinate for blackleg. While that neglect is hardly excusable (20), it is not surprising that only ten per cent have used serum to prevent "shipping fever"; so few have imported calves that this hazard has not been a problem in many instances. Importation of

Table 7. Miscellaneous practices.

| | |
|--|------|
| Percentage of farmers who dehorned calves ----- | 82 |
| Percentage of farmers who castrated calves ----- | 80 |
| Percentage of farmers who vaccinated calves for blackleg --- | 50 |
| Percentage of farmers who used anti-hemorrhagic sep. serum - | 10 |
| | |
| Average total veterinary fees per farm per year (Cattle) -- | \$15 |
| Average death loss per farm, on basis of all farms ----- | 1 |
| Average death loss per farm, on basis of losers only ----- | 4 |

more calves would likely develop a need for this preventive measure in the case of the majority of farmers.

Comparing Crop and Livestock Budgets

Trial budgets for comparing different ways of organizing the typical farm business in Trego county indicated that the net income varied according to the enterprise that was most strongly emphasized and according to the way various enterprises were combined. Many different budgets were prepared for the typical Trego county farm (640 acres) and a few were summarized in tabular form to show the various changes in emphasis from that of the present plan and to show the total production that one might expect from the various enterprises in the case of each budget (Tables 8 and 9).

Present Organization. The farm organization plan shown by the survey to be typical of Trego county depended upon cash grain crops for 65 per cent of the gross farm receipts. The crops grown included: wheat, 215 acres; grain sorghums, 15 acres; forage sorghums, 30 acres; corn, five acres; barley, 30

acres; and oats ten acres. The pasture consisted of 270 acres of native grass, largely buffalo and grama grasses. The livestock kept on this typical farm included: two horses; six milk cows; seven beef cows; one bull; eight other units of calves, yearlings and two-year-olds; two sows; and 85 hens. Ten of the young cattle had been in the stocker-calf classification during the winter. Several tons of forage were not needed by the livestock in the average year and could have been salvaged in the form of silage for use in wintering additional steers. Most of the feed grains were sold as cash crops. The man labor required in this organization amounted to 2,888 hours per year.

Of several plans arranged for the reorganization of this typical farm business, four have been displayed (Table 10) to illustrate how different emphases could change the labor requirements and the amount of income that could be expected. In the trial budgets, no changes were made that did not have a direct bearing on the beef cattle enterprise. The wheat acreage was reduced in Plans II and IV, only for the purpose of allowing space for more feed crops and a small addition to the native grass pasture. The grain sorghum acreage was changed only in the case of Reorganization Plan I, in which it was reduced one-third to allow five acres for sudan grass pasture. In each of Plans II and IV, more cows were included than were kept on the average farm, and more acres of forage crops were, therefore, necessary. Budgets were made to test the effect of a reduction or increase of the number of dairy

Table 8. Comparison of different organizations on the same 640-acre farm (Land use).

| Type of organization | Pasture (acres) | | Wheat (A., Bu.) | | Fallow (acres) | | Grain sorghum (A., Bu., T.) | | | Forage sorghum (Stover, Silage, T.) | | | Corn (A., Bu.) | | Barley (A., Bu.) | | Oats (A., Bu.) | | Sudan pasture (acres) | Farmstead (acres) |
|-------------------------|----------------------|-----|-----------------|------|----------------|-----|-----------------------------|----|----|-------------------------------------|---|----|----------------|-----|------------------|-----|----------------|---|-----------------------|-------------------|
| | Present organization | 270 | 215 | 2150 | 60 | 15 | 199 | 7 | 30 | 60 | 0 | 5 | 62 | 30 | 486 | 10 | 165 | 0 | 5 | |
| Reorganization plan I | 270 | 215 | 2150 | 60 | 10 | 133 | 5 | 30 | 6 | 162 | 5 | 62 | 30 | 486 | 10 | 165 | 5 | 5 | | |
| Reorganization plan II | 270 | 195 | 1950 | 60 | 15 | 199 | 7 | 35 | 24 | 138 | 5 | 62 | 35 | 567 | 10 | 165 | 5 | 5 | | |
| Reorganization plan III | 270 | 215 | 2150 | 60 | 15 | 199 | 7 | 30 | 20 | 120 | 5 | 62 | 30 | 486 | 10 | 165 | 0 | 5 | | |
| Reorganization plan IV | 270 | 190 | 1900 | 60 | 15 | 199 | 7 | 35 | 16 | 162 | 5 | 62 | 35 | 567 | 10 | 165 | 10 | 5 | | |

Table 9. Comparison of different organizations on the same 640-acre farm (Livestock numbers).

| Type of organization | Horses (No., Prod. (Hrs.)) | | Milk cows (No., Prod. (Lbs.), B. fat, Veal) | | Beef cows (No., Prod. (Lbs.)) | | Sows (No., Prod. (Lbs.)) | | Hens (No., Prod. (Lbs., Doz.)) | | Calves (Wintered, Win. & grazed (No., Prod. (Lbs.))) | | | | | |
|-------------------------|----------------------------|------|---|------|-------------------------------|----|--------------------------|------|--------------------------------|------|--|-----|-----|-------|-----|-------|
| | Present organization | 2 | 1000 | 6 | 900 | 0 | 7 | 2800 | 2 | 3000 | 85 | 340 | 885 | 2 | 200 | 8 |
| Reorganization plan I | 2 | 1000 | 3 | 450 | 500 | 0 | 0 | 2 | 3000 | 50 | 200 | 520 | 30* | 5400 | 30* | 10500 |
| Reorganization plan II | 2 | 1000 | 10 | 2000 | 2500 | 10 | 4000 | 2 | 3000 | 50 | 200 | 520 | 40* | 9600 | 0 | 0 |
| Reorganization plan III | 2 | 1000 | 6 | 900 | 0 | 7 | 2800 | 2 | 3000 | 85 | 340 | 885 | 20* | 3600 | | |
| | | | | | | | | | | | | | 2 | 200 | 8 | 1600 |
| Reorganization plan IV | 2 | 1000 | 2 | 400 | 500 | 18 | 7200 | 1 | 1500 | 50 | 200 | 520 | 50* | 12000 | 0 | 0 |

*Better quality calves than the average of the present stock in Trego county.

cows in the livestock budget, with more cows in Plan II and fewer in Plans I and IV.

It was found to be difficult to design a management system which would be best for all farm operators. The farmer's individual interests and talents were found to be an important variable, which would change the resultant income by increasing or decreasing the efficiency in each of the various enterprises. So it was understood that these budgets had to be built on the basis of standard figures for average farmers and normal times.

Reorganization Plan I. In Plan I no beef cows were included, but 60 choice stocker calves were to be purchased in the fall of each normal year. The number of stockers could vary according to the yield of the forage sorghums. Only enough good milk cows were included to make certain of a constant supply of milk for the home and farm requirements. This plan required the least man labor per year of all the plans and was almost a one-man unit (Table 10). The advantage of this plan is due in part to the higher market prices expected. Doll (10) found higher returns would be possible in cases where choice livestock and superior practices were used.

Reorganization Plan II. More cows, both beef and dairy, were included in Plan II than were found in the Present Organization. Besides ten each of excellent beef and dairy cows, this organization included 40 choice stocker calves, which would be purchased in October or November directly from a

Table 10. Comparison of returns in dollars under different types of organizations on the same 640-acre farm.

| | Type of organization | | | | |
|---|----------------------|------------------|-------------------|--------------------|-------------------|
| | Present plan | Reorg. plan I | Reorg. plan II | Reorg. plan III | Reorg. plan IV |
| Expected crop sales | | | | | |
| Wheat | 1631.80 | 1631.80 | 1441.56 | 1631.80 | 1424.34 |
| Gr. Sorg. | 41.08 | 24.44 | -- | 41.08 | -- |
| Corn | 37.82 | 37.82 | -- | 37.82 | -- |
| Barley | 70.50 | 117.03 | -- | 98.35 | -- |
| Expected sales, livestock and l.s. products | | | | | |
| Butter fat | 195.00 | 60.00 | 519.00 | 195.00 | 45.00 |
| Beef | 433.65 | 1451.63 | 2496.52 | 811.77 | 2934.40 |
| Pork | 188.75 | 188.75 | 188.75 | 188.75 | 75.50 |
| Hens | 150.90 | 68.26 | 68.26 | 150.90 | 68.26 |
| Gross income | 2749.50 | 3579.73 | 4714.09 | 3155.47 | 4547.50 |
| Variable expenses | | | | | |
| Livestock | 40.85 | 255.25 | 1296.90 | 178.35 | 1378.21 |
| Crop exp. | 43.44 | 39.70 | 62.93 | 40.80 | 59.93 |
| Fuel and oil | 209.25 | 208.43 | 228.83 | 209.25 | 232.71 |
| Interest | 28.00 | 112.00 | 81.75 | 63.00 | 112.00 |
| Death loss | 50.00 | 64.00 | 65.00 | 54.00 | 76.00 |
| Silo exp. | -- | 50.00 | 50.00 | 50.00 | 50.00 |
| Freight | 9.98 | 119.70 | 83.55 | 44.78 | 96.00 |
| Tax (cattle) | 14.00 | 56.00 | 40.88 | 31.50 | 56.00 |
| Yardage | 8.00 | 30.50 | 25.00 | 18.00 | 25.00 |
| Commission | 12.00 | 20.00 | 21.00 | 14.00 | 21.00 |
| Labor exp. | 177.70 | 66.70 | 368.10 | 277.90 | 353.60 |
| Total variable expense | 593.22 | 1022.28 | 2323.94 | 981.58 | 2460.15 |
| Receipts minus variable expense | 2156.28 | 2557.45 | 2390.15 | 2173.89 | 2087.35 |

ranch where good livestock is bred. Plan II required more hours per year of man labor than was necessary in the case of any of the other organizations, but it offered a good market for a great deal of family labor which might be available in the case of a large family.

Reorganization Plan III. The least variation of all the plans from the organization found to be typical of the average farm was made in Plan III. No change was made in crop acres or in the livestock, either in quality or in numbers, except for the addition of 20 choice stocker calves which were to be wintered on surplus roughage, which was on hand in the average case, and roughage which could be conserved by storing the feed for all the cattle in the form of silage instead of storing it and feeding it dry (17). In this case the silo was to become the means of changing otherwise unmarketable roughage into 3,600 pounds of choice beef, without requiring additional use of the pasture or increased acreage of feed crops. The 20 calves added to the cattle numbers would pay the operator \$117.81 for six months of care. This would amount to an increase of 60 cents a day in the farmer's labor income for a period of 180 days.

Reorganization Plan IV. While this last plan, involving the use of 18 choice beef cows and two good dairy cows, seemed to offer the poorest prospects for an increase in net income over that already obtained in the case of the Present Organization; yet it might become a desirable plan for a farm opera-

tor who is interested in breeding purebred beef cattle. While the average operator who would attempt the use of this system would likely work a maximum number of hours for a minimum of net income, a talented farmer who is interested in a purebred livestock specialty, or a farmer following better than usual management practices might succeed with this plan.

Effect of Organization on Labor and Income. In all of the plans there would be opportunities, not here mentioned, for increasing the net income by the use of more efficient practices in each of the farm enterprises. In this study, however, only changes in practices related to the wintering and feeding of stockers were considered.

In Table 10, which shows cash income expected from each enterprise as included under the various organizations, there was also anticipated in the case of each type of organization a number of variable cash expenses, due to such things as death losses, silo expense, freight, yardage, commission and interest on money invested in cattle. By subtracting all of the variable expenses (excluding fixed expenses) from the gross farm income expected in the case of each of the different organizations, index figures were obtained for use in comparing the net incomes one might earn from the various organizations. The receipts minus the variable cash expenses, shown in Table 10, are not intended to be actual incomes but equitable figures for comparing net incomes likely to be derived from various organizations of the enterprises on the same typical farm. Such expenses as taxes on land, machinery

expense and many other costs were not listed, but they would be the same in all cases and would not affect the differences in net incomes.

It will be noticed that, while Reorganization Plan I yields the highest net income, Plan II yields the largest amount for net income plus labor expense. In all budgets, all labor over 2,000 man hours per year was included as an expense at the rate of 20 cents per hour. The choice of organization might depend on the amount of family labor available as well as on the supply of hired labor. Reorganization Plan I requires the least labor of all and yields the highest labor income per hour. On the basis of total man hours, this was \$1.13 for Plan I, as compared with 65 cents for Plan IV and 81 cents an hour for the Present Organization.

Trego county farmers and their fathers before them had grown up thinking in terms of cow herds and calf production and they had not been accustomed to thinking in terms of the more complex farm organization necessary for present-day conditions. The wintering of stockers has been shown to be better economy on the average farm than the production of calves. However, it has been extremely difficult to design on paper an organization which would excel the plan developed by the plains farmers through generations of experience with cow herds and field crops. Yet it will be noticed (Table 11) that the \$1.13 per hour, the 81 cents per hour and the 65 cents per hour are matched respectively with no beef cows at all, seven beef cows

Table 11. Effect of organization on labor and income (Fixed expenses not considered).

| Basis of comparison | : Present: | | Suggested reorganization | | | |
|--|------------|----------|--------------------------|-----------|---------|--|
| | organiza: | Plan I : | Plan II : | Plan III: | Plan IV | |
| Net income | 4 | 1 | 2 | 3 | 5 | |
| | | | <u>Rank</u> | | | |
| Beef cows | 7 | -- | <u>Number of animals</u> | | | |
| Calves wintered | 10 | 60 | 10 | 6 | 18 | |
| | | | 50 | 30 | 50 | |
| | | | <u>Dollars</u> | | | |
| Income per hour on basis of total hrs. | .81 | 1.13 | .72 | .72 | .65 | |
| Income per hour on basis of 2000 hrs. | 1.08 | 1.28 | 1.19 | 1.09 | 1.05 | |
| Hired labor | 177.70 | 66.70 | 368.10 | 277.90 | 353.60 | |
| Total labor income including hired labor | 2333.98 | 2624.15 | 2758.25 | 2451.79 | 2440.95 | |
| Receipts minus variable expenses | 2156.28 | 2557.45 | 2390.15 | 2173.89 | 2087.35 | |

and 18 beef cows; the more beef cows in the organization, the less the labor income per hour.

On the basis of 2,000 hours of work per year, a farmer could earn \$1.28 an hour in the case of Reorganization Plan I, or 20 cents an hour more than in the case of the Present Plan.

In this study the preparation of comparative budgets was intended merely to show how the application of the findings of experiment stations could increase the farm income. But in addition, the budget study has revealed that beef cows are not usually as profitable as stockers in Trego county. According to Snapp (20) cow herds require an abundance of cheap pasture. In Trego county this was found to be very limited on the average

farm. So it was not surprising that the wintering phase, dependent on feed crop production, proved to be more profitable. However, it was considered important to remember that a good cow-herd business could not be excelled by a poor wintering program. Excellent calves, handled according to the most efficient methods, would be essential to the success of a wintering program.

Also it was pointed out that this study has been concerned more especially with the typical farm and the average operator. A large farm, which does have pasture facilities similar to those in the range areas of the state, was considered an exception to the rule that cow herds should not be emphasized above a stocker business. Another point to bear in mind is the fact that beef cows can digest roughages which are too coarse or too low in quality even for stockers; without beef cows, such resources would be lost.

Reorganization Plans Suggested for Various Typical Sizes of Farms in Trego County

Prepared from standard figures based on long-term averages, these budgets were expected to apply only in the case of average yields and normal times. Allowance would be necessary in individual cases due to differences in soil fertility, topography, efficiency of the operator, the existing market trends and the degree to which times are normal. But the trial-and-error experiments in budget reorganization have indicated that Plan I would apply to the average farm in each of the four size-groups (Table

Table 12. Four typical sizes of Trego county farms reorganized on basis of reorganization plan I (Suggested changes underlined).

| | Four typical farm sizes | | | | | | | |
|---------------------|-------------------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|-----------------|
| | 1400 | | 640 | | 480 | | 320 | |
| | Pres-ent plan | Sug-gested plan | Pres-ent plan | Sug-gested plan | Pres-ent plan | Sug-gested plan | Pres-ent plan | Sug-gested plan |
| Land use (Acres) | | | | | | | | |
| Pasture | 775 | 775 | 270 | 270 | 185 | 185 | 120 | 120 |
| Wheat | 330 | 330 | 215 | 215 | 150 | 150 | 90 | 90 |
| Fallow and idle | 149 | 149 | 60 | 60 | 75 | <u>55</u> | 35 | 35 |
| Gr. Sorg. | 30 | <u>20</u> | 15 | <u>10</u> | 10 | 10 | 5 | 5 |
| For. Sorg. | 50 | 50 | 30 | 30 | 15 | <u>30</u> | 20 | <u>30</u> |
| Corn | 5 | 5 | 5 | 5 | 5 | 5 | 10 | <u>5</u> |
| Barley | 40 | 40 | 30 | 30 | 25 | 25 | 25 | <u>15</u> |
| Oats | 15 | 15 | 10 | 10 | 10 | 10 | 5 | <u>10</u> |
| Sudan | | <u>10</u> | | <u>5</u> | | <u>5</u> | 5 | 5 |
| Fm.stead | 6 | 6 | 5 | 5 | 5 | 5 | 5 | 5 |
| Livestock (Numbers) | | | | | | | | |
| Horses | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| Milk cows | 7 | <u>3</u> | 6 | <u>3</u> | 7 | <u>3</u> | 6 | <u>3</u> |
| Beef cows | 28 | <u>20</u> | 7 | <u>0</u> | 5 | <u>0</u> | 4 | <u>0</u> |
| Sows | 2 | 2 | 2 | 2 | 3 | 3 | 1 | 1 |
| Hens | 100 | 100 | 50 | 50 | 50 | 50 | 50 | 50 |
| Calves wintered | 25 | <u>100</u> | 10 | <u>60</u> | 7 | <u>60</u> | 5 | <u>60</u> |
| Calves grazed* | 20 | <u>30</u> | 8 | <u>30</u> | 6 | <u>20</u> | 4 | <u>10</u> |

*Of the calves wintered, as many will be retained for summer grazing as the pasture will carry.

12) in such manner as to increase the income. By means of better utilization of roughages and through more efficient management, it would be possible -- without reducing the acreage of cash crops -- to put on the market more beef as well as better beef. More beef would be possible through having more cattle and by securing faster gains due to a better quality of cattle and a better balanced ration. Better beef would be possible because of the difference in grade and because of improved feeding.

The only way to obtain the suggested number of better quality calves, not now available in Trego county, is to go to other areas for them. Buying directly from the ranch where the calves are raised has the added advantage of diminishing the punishment to which calves are subjected in shipment. One trip from range to a Trego county feed lot would be much easier for a calf to endure than shipment to various sales rings with the additional move from the sales ring to the farm. Every unnecessary shipment adds to the likelihood that calves will contract "shipping fever" or various other diseases or injuries. While calves purchased from a good source do cost more, they also sell at a higher rate when marketed, and return a greater profit to the feeder (20). This is due in part to better utilization of feed and to faster gains made by the better quality animals. Besides the economic advantage of handling animals of good quality, there is also the advantage resulting from the greater personal pride and satis-

faction in feeding good quality cattle.

Since the wintering program depends on feed crop acreage rather than on the size of the farm, the small farm can winter as many calves as the average farm. Feed, to the extent of ten tons of dry roughage and 11 tons of silage, will be needed for work stock and dairy cattle in Reorganization Plan I. All roughage over that amount should be put into the silo and used for the wintering of calves at the rate of two and one-half tons per calf. Only 30 acres of pasture are needed in this plan for use by work stock and milk cows. All acres of pasture above that could be appropriated for the summer grazing of calves at the rate of eight acres per calf. Enough stocker calves could be retained at the time of the spring marketing to utilize the available grass. Basing the wintering program on the feed crop production and supplementing the pastures with five acres of sudan grass, the farmer would be able to provide feed even in dry years. By storing silage enough for two or more years, he could always depend on enough cheap feed for the livestock which he keeps the year round. In case of crop failure, he would know of the feed shortage in time to avoid purchasing the usual number of stockers. In case of high yields of feed, he could buy more calves than usual.

The feed supply could be increased by seeding more acres to sorghum crops. It would be made more dependable and abundant by increasing sorghum yields through summer fallowing,

contour farming, choice of better varieties, and by the use of other improved production practices. The silo would increase the efficiency of feed utilization to the extent of almost 100 per cent.

Subject Matter Content of an Adult Education Program

This study has set forth the practices best suited for use in wintering calves under conditions similar to those on a typical Trego county farm and has illustrated their use by means of a reorganization of farm management plans. The investigation has included a survey of Trego county which revealed the nature of typical practices used in the calf-wintering phase of the beef cattle industry. By comparison of these data, a basis was found for the subject matter content of an adult education program.

Educational Objectives. The educational objectives of the program were concerned with Trego county beef cattle practices which were not consistent with recommended methods. By noting variations between the survey data and the data from the literature on the wintering of calves (Table 13), it was found that the practices used by the farmers are faulty in several ways.

The Major Emphasis. The major emphasis in the beef cattle business has been on the cow herd, with calf production as the chief phase of the enterprise. According to Snapp (20) this is the dominant phase of the business in the western

Table 13. Differences found between the present plan of wintering stocker calves and the recommended plan.

| | : Present : | Recommended : | Difference |
|--------------------------|-------------------------|---------------|------------|
| | : plan : | plan : | |
| | Number of animals | | |
| Calves raised per farm | 12 | -- | 12 |
| Calves wintered per farm | 10 | 60 | 50 |
| | Percentage of all farms | | |
| Used good quality calves | 44 | 100 | 56 |
| Purchased calves in fall | 8 | 100 | 92 |
| Sold calves in the fall | 46 | -- | 46 |
| Had one or more silos | 16 | 100 | 84 |
| Fed silage | 14 | 100 | 86 |
| Fed limestone | 8 | 100 | 92 |
| Fed protein supplement | 20 | 100 | 80 |
| Vaccinated for blackleg | 50 | 100 | 50 |
| Used hem. sep. serum | 10 | 100 | 90 |

range. Comparisons of various trial budgets for the typical Trego county farm indicate that calf-wintering might well be expanded.

Quality. Less than half of the calves wintered in Trego county were found to be of good quality; 56 per cent of them were in medium and common grades. Furthermore, 46 per cent of them were of mixed breeds. Whether purchased or raised, they should be of at least good grade, since quality increases the feeding efficiency and raises the probable market price.

Dates for Purchase and Sale. Whereas the dominant tendency in the county was found to be toward selling calves in the fall and shifting the emphasis away from the calf-wintering phase, the more profitable management practice would be

found in the plan of buying more calves in the fall and selling in the spring when the prices are higher.

Feed Storage. While only 16 per cent of the farmers had silos and only 14 per cent used silage in calf feeding, all farmers should have silos for feed storage and use silage in the wintering ration. Silos will keep feed indefinitely and until fed. One acre of feed stored as silage will produce almost as much gain as two acres of feed stored and fed dry, the yield being identical.

Calcium Content of Ration. Whereas only eight per cent of the farmers fed ground limestone, all who do not feed alfalfa should include one-tenth pound of limestone in the ration per calf per day. Usually this practice will eliminate the hazard of wheat pasture poisoning. It can do no harm in the ration and the cost is negligible.

Protein Supplement. Twenty per cent of the farmers neglected to use the economical practice of feeding one pound of cottonseed meal per calf per day. Experiments have shown that 2,000 pounds of cottonseed meal used to supplement a low-protein ration will produce 1000 pounds of additional beef (12). One pound per day is the most economical quantity to feed (17).

Elimination of Hazards. Early castration and dehorning, faithful attention to vaccination for blackleg and the general use of immune serum for the prevention of "shipping fever" were recommended; whereas, many of the farmers were either uninformed or negligent in respect to the hazards involved.

Plans for the Educational Program

Farmers' Education and Experience. The average farmers for whom the educational program was prepared, were found to have reached the eighth grade in school (Table 14). They had been farming for an average of 28 years. About one-fourth of them had visited the cattle-wintering experiments at Hays, Kansas, and two per cent of them had written one or more

Table 14. Farmers' education and experience.

| Educational factors investigated | : Type of farm according to median of number of acres | | | |
|---|---|---------|---------|--------|
| | :1400 A.: | 640 A.: | 480 A.: | 320 A. |
| Average grade attained in school | 8.3 | 7.4 | 7.9 | 7.4 |
| Average number years of farm experience | 34 | 29 | 28 | 21 |
| Percentage of all farmers: | | | | |
| Visited Hays cattle expt. | 50 | 22 | 13 | 27 |
| Wrote requests for information on beef | 8 | -- | -- | -- |
| Subscribed for: | | | | |
| Capper Publications | 100 | 93 | 30 | 45 |
| Farm Journal | -- | 30 | 38 | 45 |
| Country Gentleman | -- | 15 | 14 | -- |
| Breeders Gazette | 8 | 7 | -- | -- |
| Poultry Journal | 15 | 15 | 7 | -- |
| Successful Farming | 8 | 22 | 21 | 9 |
| Subscribed for no magazine | -- | -- | 21 | 45 |
| Interested in adult school on beef production | 25 | 30 | 21 | 18 |

letters during the previous year for information on beef cattle production. All the farmers in the two groups having larger

farms subscribed for one or more farm magazines (Table 14). Twenty-one per cent of the farmers in the 480-acre-farm group and 45 per cent of those in the small-farm group subscribed for no farm magazines at all.

A Program of Adult Education. The teaching methods and devices suggested in the literature for use in adult education were: lecture, open forum, informal discussion, panel discussion, demonstration, symposium, movies and slides, charts, mimeographed information sheets, and dramatizations (See pages 8 and 9). As many as possible of these were made use of in the suggested program (Appendix) which was outlined under the following headings: a program of education for the improvement of the beef cattle industry of Trego county, subject matter for ten discussions on wintering and feeding stocker calves, program outline for the dramatized discussion meeting, and organization suggested for the adult school.

The adult education program, thus outlined, included a calf-wintering demonstration at Trego Community High School, to be conducted by the Future Farmer chapter. It provided also for demonstrations by progressive farmers, the systematic use of magazine and newspaper articles, and the promotion of credit for use in purchasing calves. The coordinating feature of the whole program was to be an adult school consisting of a series of ten dramatized discussion meetings, planned for the systematic presentation of subject matter which is important to the success of the beef enterprise.

SUMMARY AND CONCLUSIONS

It has been the purpose of this study to determine what subject matter it would be necessary to include in a program of adult education for the improvement of the beef cattle industry of Trego county. To accomplish this it has been necessary to make a survey of the practices used by the farmers of the county in beef cattle production; to study the literature, including the records of the Kansas State Experiment Station; and to consult authorities in the fields of Animal Husbandry, Agricultural Economics and Adult Education. Several important facts have been found and a number of conclusions have been stated.

1. The average farmer's equipment is more nearly adequate for beef cattle than it is for dairy cattle or for sheep.

2. The commercial wintering of stockers should be emphasized as a major farm business and should be one of the principal sources of farm income in Trego county, ranking well with wheat production. Almost unlimited expansion of this phase of the industry would be possible by increasing both the feed storage facilities and the feed crop acreage.

3. Since calves are better to carry on into the summer grazing phase (7) and since, in the spring, yearlings sell to better advantage than calves as fleshy feeders, both calves and yearlings should be considered in the choice of stockers.

4. Cattle purchased for the wintering program should be

good quality calves or yearlings, obtained as directly as possible from the herd which produced them. Cattle found on Trego county farms were too often of mixed breeds and poor in quality. While good dual-purpose cows and dairy cows have a place in the county, the practice of keeping beef cows for milk, or scrub cattle for any purpose, should be discouraged.

5. Stockers should be purchased in October and November and they should be sold about May 1.

6. Silage should be used as the principal source of roughage for all the cattle on the farm. The present acreage of feed crops would support more cattle if it were stored as silage, and thus the beef business could be expanded.

7. The stockers should be fed in relatively small enclosures, except when grazing on good wheat pasture.

8. In the dry lot, stockers should be fed a protein supplement, consisting of one pound of cottonseed cake or soybean oil meal, two pounds of wheat bran, or three pounds of ground alfalfa hay per steer per day. The average Trego county farmer has neglected this most important practice. In some cases the more expensive practice of using grain as a protein supplement was in use.

9. When available and abundant, wheat pasture may be allowed to take the place of the protein supplement and a part of the roughage. In all cases, however, the feeding of ground limestone and dry roughage should be continued as a safeguard against wheat poisoning.

10. Cattle were found to be dying of both wheat and grass pasture poisoning because farmers do not make sure that each animal consumes daily enough dry roughage and calcium; merely offering the dry roughage and the calcium may not be sufficient. During the pasture season, penning the cattle at night with a full straw rack in the lot would take care of the dry roughage requirement. To make sure that the cattle build up and maintain a sufficient calcium reserve in the blood to be safe when turned on wheat pasture, one should feed a calcium supplement even when the cattle are in the dry lot, mixing ground limestone with the protein supplement or the silage at the rate of one-tenth pound per head per day. When cattle are on either wheat pasture or lush grass pasture, the limestone should be mixed with the salt and supplied to the cattle as the only source of salt. A minimum of one pound of dry roughage per head per day, limestone supplied as directed and a constant supply of drinking water should stop the heavy death losses which have been caused by this pasture hazard.

11. Calves should be dehorned, castrated, vaccinated for blackleg and given serum treatment for the prevention of hemorrhagic septicemia.

12. As demonstrations are effective in adult education, the approved practices pertaining to the wintering of stockers should be demonstrated by the school and by progressive farmers whenever possible.

13. At least one series of discussion meetings should be

held in the county for the purpose of carrying out a well planned program of adult education for the improvement of the beef cattle industry.

14. To make each meeting successful from the standpoints of interest and attendance, subject matter which is to be presented as a lesson should be dramatized and given in the form of a short play just previous to the period for discussion.

15. These meetings should have the support of all the educational facilities of the county, including the local newspaper, the county office of the Agricultural Adjustment Administration, the 4-H Clubs, the community service clubs, and all the public schools of the county.

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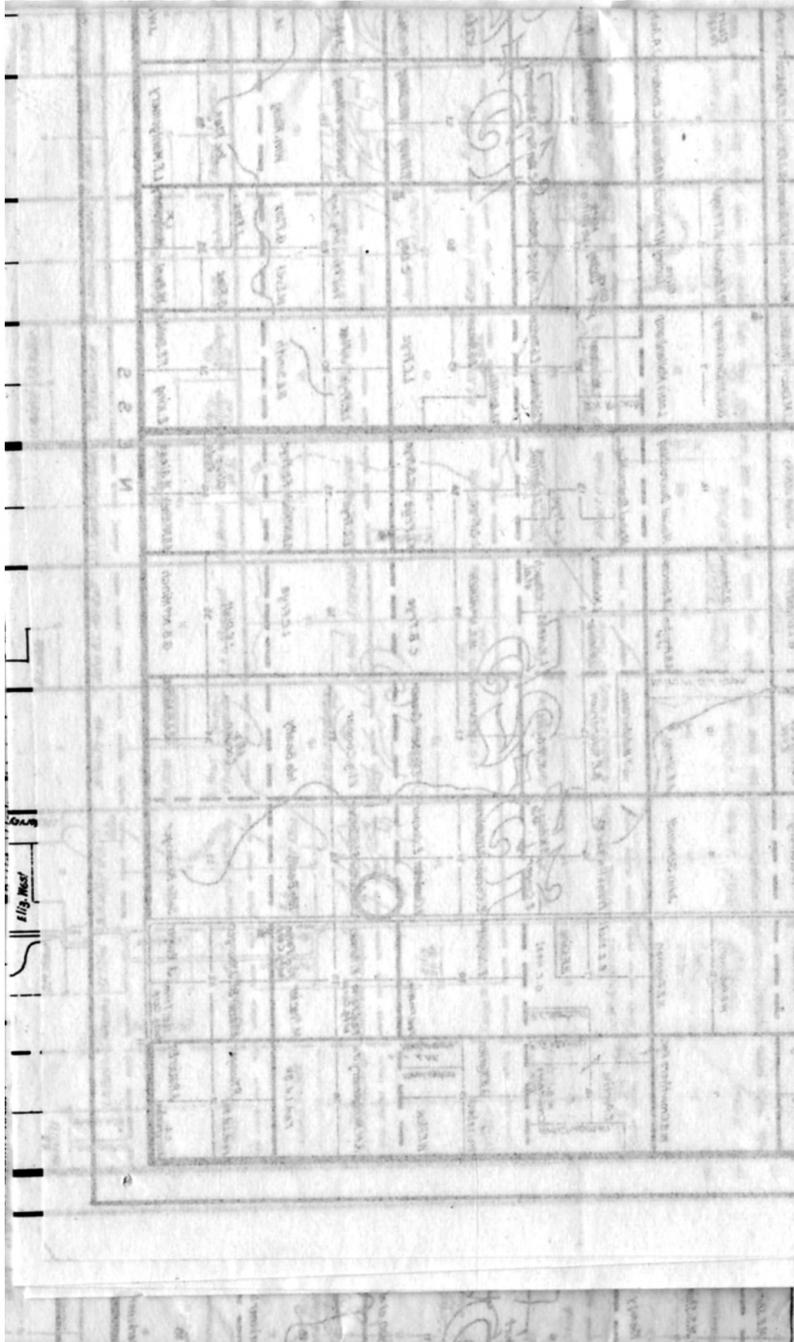
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APPENDIX

Explanation of Plate I

Plate I is a map of Trego county, Kansas, showing the location of each farm which was visited in the beef cattle survey. The 12 large farms were designated by the use of red circles drawn on the map, as nearly as possible, at the exact location of the farmer's home. Green circles were used to show the location of the 13 farms second in size, blue circles for the 14 farms third in size, and black circles for the 11 farms in the small-farm group. The even distribution over the county was due to random sampling.

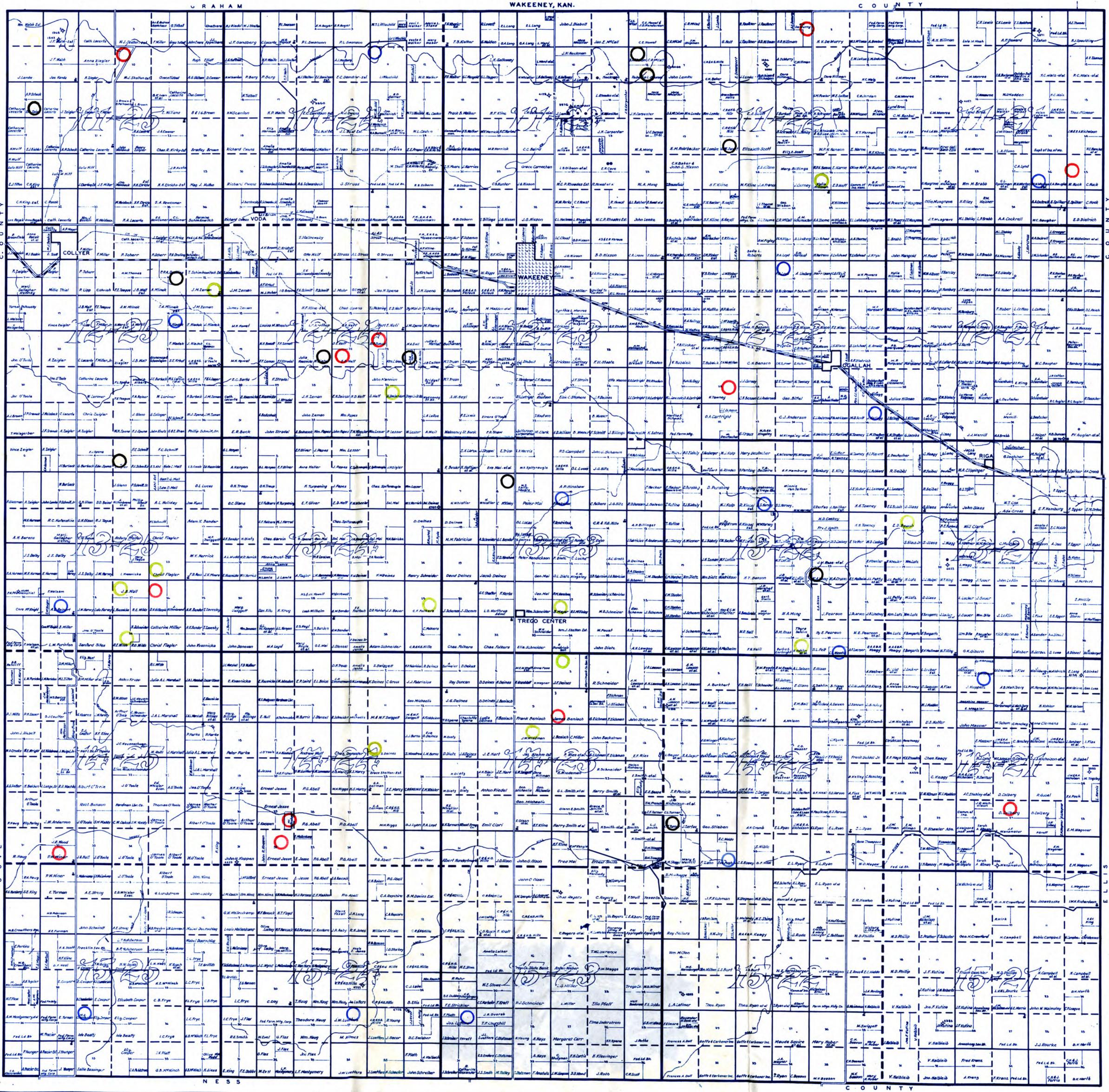
PLATE I



TREGO COUNTY, KANSAS

J.O. KESSLER
 REGISTER OF DEEDS.

- LOCATION -----○
- DRILLING -----○
- OIL WELL -----○
- GAS WELL -----○
- ABANDONED -----○
- DRY -----○
- SCHOOL -----○
- CHURCH -----○
- RAILROAD -----○
- OPEN ROAD -----○
- NO ROAD -----○
- PAVED ROAD -----○
- SURFACE -----○



Trego County

SURVEY OF FARM PRACTICES -- WINTERING STOCKER CALVES

1940 -- 41

Township _____ Farm Number _____

Operator _____ Address _____

Location _____ miles _____ of _____ S _____ T _____ R _____

USE OF LAND - 1941

| Tenure | Crop land | Native grass | | Waste | Farmstead | Total | Rental |
|--------------|-----------|--------------|---------|-------|-----------|-------|--------|
| | | Hay | Pasture | | | | |
| Owned | | | | | | | |
| Share-rented | | | | | | | |
| Cash-rented | | | | | | | |
| Total | | | | | | | |
| Rented out | | | | | | | |
| Operated | | | | | | | |

ORGANIZATION

| Crop acres | 1941 | Normal | Numbers of livestock | June 1, 1941 |
|--------------------------------|----------------|--------|----------------------------|--------------|
| | Corn for grain | | | |
| Corn for silage | | | Saddle horses | |
| Corn cut and shocked | | | Other horses | |
| Corn pastured off | | | Cows milked | |
| Grain sorghums | | | Other dairy cattle | |
| Forage sorghum for silage | | | Beef cows | |
| Forage sorghum cut and shocked | | | Beef calves under 6 months | |
| Oats | | | Yearling steers | |
| Wheat | | | Yearling heifers | |
| Barley | | | Steers, 2 years or more | |
| Alfalfa | | | Heifers, 2 years or more | |
| Other legumes for hay | | | Replacement heifers | |
| Sowed cane or other hay | | | Bulls | |
| Orchard or truck crops | | | All other cattle | |
| Legumes for soil improvement | | | Sows and gilts | |
| Idle or fallowed land | | | Fall pigs | |
| Sweet Clover | | | Spring pigs | |
| | | | Other hogs | |
| | | | Ewes | |
| | | | Lambs | |
| | | | Other sheep | |
| | | | Hens | |
| | | | Young chicks | |
| | | | Other poultry | |

OTHER LIVESTOCK NOT ACCOUNTED FOR IN INVENTORY

| | |
|------------------|---------------------------------|
| Cattle wintered | Fall pigs sold prior to June 1. |
| Cattle grain fed | Cattle on pasture rented out. |
| Feeder lambs | |

WINTERING STOCKER CATTLE (Winter of 1940-41)

| | | | | |
|--|-----------------------|--|---|-------------|
| Number _____ | Breed _____ | Ration: _____ | Daily _____ | Total _____ |
| Age _____ Sex _____ | Grade _____ | | | |
| Raised _____ | Date purchased _____ | | | |
| Wintered from _____ | to _____ | | | |
| Final Weight _____ | Death loss _____ | | | |
| Hours man labor _____ | | | Small grains ground? _____ | |
| per day _____ | Total man hours _____ | | How ration varied on wheat pasture: _____ | |
| Source of calves _____ | | | | |
| Cost of delivery per calf _____ | | | | |
| Cost of marketing per calf _____ | | Total veterinary fees (wintering) _____ | | |
| Method of marketing: _____ | | All dehorned _____ Castrated _____ | | |
| Shipped to Kansas City _____ | | Vaccinated for blackleg _____ | | |
| Sold in local sale ring _____ | | Soda treatment used (when) _____ | | |
| Sold at private sale _____ | | Anti-hemorrhagic septicemia serum administered to: _____ | | |
| Source of credit (if any) _____ | | All calves purchased _____ | | |
| Equipment on hand for wintering: _____ | | Sick calves only _____ | | |
| | | First ration on arrival: _____ | | |

EDUCATIONAL DATA:

Grade attained in school _____ No. meetings attended in past 12 months for improving success in beef cattle prod. _____

No. years of vocational ag. _____ No. bulletins read in the past 12 months on beef production _____

No. years in agri. college _____ No. of visits during the past 12 months to cattle projects at Kans. Exp. Stations _____

No. years experience in farming _____

No. letters written during the past year for information on beef production _____

Farm magazines subscribed for _____

Interested in a series of educational meetings conducted by the voc. agri. department of the school on the subject of beef production. _____

A Program of Adult Education for
the Improvement of the Beef Cattle Industry in
Trego County

1. A calf wintering project at school, conducted by the F.F.A.
 - a. Posters displayed near the feed lot.
 - (1). General description of the project.
 - (2). Source of stockers; date of purchase; price.
 - (3). Ration; feed acres per calf; with and without a silo.
 - (4). Record of vaccination and serum treatment.
 - b. Frequent newspaper stories about the project.
 - c. Poster at post office describing the project and giving summary of feeds used, gains, and net profit.
2. Demonstration farms (Farmers agreeing to use the calf-wintering program herein suggested).
 - a. One farm of each typical size, -- 1400 acres, 640 acres, 480 acres and 320 acres.
 - b. Locate these farms in different parts of the county.
 - c. Display a bulletin board at the farm, indicating that this farm is demonstrating a program of wintering stocker calves.
 - d. Keep the public informed as to the progress of these demonstrations.
3. Magazine articles about the wintering program for publication in the Kansas Farmer, which was found in the homes of the majority of the farmers.
4. Promotion of credit for use in purchasing calves by farmers who wish to cooperate with the plan of wintering calves.
 - a. Inform those who have money to lend that the program is sound if recommended practices are followed.
 - b. Provide credit men with concise information as to the exact nature of approved practices which are likely to insure success.

5. One or more series of discussion meetings for adults.
 - a. First series near the F. F. A. calf-wintering project.
 - b. Meetings scheduled for the time of year when the calf-wintering project is in progress, two evenings per week.
 - c. Subject matter presented in dramatized form along with the use of specially composed songs and suitable games for adults.

Ten Discussions on Wintering and Feeding Stocker Calves
as a Part of
A Program of Adult Education

1. Survey of practices used on the typical Trego county farm in the wintering of stocker calves and a study of the situations affecting the success of the wintering phase of the beef cattle industry of the county.
2. Study of various methods of organizing the typical farm business in Trego county and their effect on the net income from the farm business as a whole; the desirability of wintering calves over that of other phases of beef production in the county.
3. Effects of grade, type, sex, and breed of calves used in a calf-wintering project upon the amount of profit to be expected. The selection of stocker calves.
4. Time and place to buy calves for the wintering project. A plan to buy cooperatively: cooperative credit; cooperative transportation.
5. Elimination of hazards from the calf-wintering project; -- injuries due to horns; loss due to castration; deaths due to diseases and poisoning.
6. Protein requirements of calves.
7. Providing feed for the wintering of calves. Approved practices for use in growing sorghum crops.
8. Silo construction, feed storage and feed processing.

9. Equipment needed for wintering calves; watering equipment, feed racks, feed bunks, grinders, windbreaks, sheds, loading chutes, dehorning equipment and syringes.
10. Minerals and vitamins in the ration. Review of feeding practices.

Program for the Dramatized Discussion Meeting

- 7:30 Practice for cast of actors who are to take part in the dramatized presentation.
- 8:00 Opening of meeting. Presentation of musical features.
- 8:10 Group singing of patriotic songs and parody songs specially composed on the subject of wintering stockers.
- 8:20 Dramatized presentation of the subject matter of the lesson to be taught; presented by a cast of farmers, their wives and children.
- 8:40 Group discussion developing from the dramatized material and starting in the form of planned contributions coming from farmers sitting in the audience. The teacher of vocational agriculture should serve as discussion leader.
- 9:40 Games, contests or other play activities for adults.
- 10:00 Business session in charge of officers elected at the first meeting of the group.
- 10:10 Coffee and doughnuts served while informal discussion and observation of posters continue. Posters and charts from previous sessions to be displayed at each subsequent meeting.
- 10:20 Adjournment. Rehearsal for the cast scheduled for the next dramatized lesson. Play parts assigned and script passed out to the players two weeks in advance, but usually no special practices scheduled except the ones here mentioned.

Organization Suggested for the Adult School

1. The high school to furnish the meeting place, heat, light, supplies and teaching materials.
2. The teacher of vocational agriculture to serve as general director, prepare lesson plans, supply technical information to departments assisting, and prepare material for information sheets to be mimeographed.
3. Community interest in the meetings to be aroused by means of the cooperation of other departments of the day school.
 - a. The commercial department to mimeograph information sheets to be distributed at each session.
 - b. The dramatics class to assist with the playlets.
 - (1) Write the plays.
 - (2) Plan and provide the costumes.
 - (3) Plan and apply the make-up.
 - (4) Coach the plays.
 - c. The art department to design and construct charts and posters on the basis of technical information and suggestions furnished by the vocational agriculture teacher.
 - d. English composition students to compose the parody songs.
 - e. The music department to provide excellent music for the opening of each session.
 - f. Committees from the Future Farmer chapter to conduct games and contests for the adults during the recreation period.
 - g. The home economics students to take turns in making the coffee and doughnuts.
 - h. The journalism class to conduct an advertising campaign and report all sessions to the local papers. A contest in this department to be conducted for the honor of sending an article to the Kansas Farmer, describing the calf-wintering program and the evening school.
4. A member of the Animal Husbandry faculty of Kansas State College of Agriculture and Applied Science to be secured to lead the discussion at the last meeting.

5. Adults who attend eight or more sessions of the adult school to be given a certificate of class membership and his credentials to be entered on a permanent record of adult work in the school.