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### Fort Hays State University Farm

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## INTRODUCTION

The University farm should be a leader in the most modern agricultural practices available. Its mission is teaching students these modern practices even though some students can not always use them. To do this, the farm must establish goals and strive toward them with utmost energy.

In 1972, the Fort Hays State University Farm was not meeting the needs of the academic community. For many years, it had been used as a Range Management Research Station, but many agriculture classes were not able to utilize the farm. By 1972, the academic community began to look to the farm for support and found it lacking due to poor or inadequate facilities. The

### FORT HAYS STATE UNIVERSITY FARM

#### ITS RECENT HISTORY: ITS IMPROVEMENTS: ITS GOALS

In 1973, the Kansas State Legislature (H.R. 1000) that would allow animal science classes to work livestock inside during inclement weather. A five-year plan was then proposed in 1978 which would bring the farm up to efficiency and effectiveness required by people using its facilities. Since then, the State Legislature has supported the farm and the following buildings have been erected or rebuilt:

July 7, 1981

1. A 20 crate farrowing house was erected (1980).
2. A new shop was erected (1980).
3. The existing shop was recovered and converted to a machine storage area (1980).
4. Sewer lines and a septic tank were installed for the shop, Heigel Building, and a tenant trailer house owned by an employee of the farm (1980).
5. Two 5,000 bushel grain bins were erected (1980).
6. Ninety-four free stalls were installed in the present loafing shed of the dairy (1981).
7. A swine gestation house will be erected in 1982.
8. An electrical substation will be erected which will add efficiency and dependability to the farm's electrical supply (1982).

Dr. John McGaugh  
Farm Superintendent

## INTRODUCTION

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In 1972, the Fort Hays State University Farm was not meeting the needs of the academic community. For many years, it had been used as a Range Management Research Station, but many agriculture classes were not able to utilize the farm. By 1972, the academic community began to look to the farm for support and found it lacking due to poor or inadequate facilities. The framework of financial support made it almost impossible for the farm to respond to these needs. In 1975, the Kansas State Legislature appropriated \$24,000 toward an arena (Riegel Building) that would allow animal science classes to work livestock inside during inclement weather. A five-year plan was then proposed in 1978 which would bring the farm up to efficiency and effectiveness required by academic people using its facilities. Since then, the State Legislature has supported the farm and the following buildings have been erected or rebuilt:

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Additional buildings planned for the future include: baby pig nursery, finishing floor, sheep barn and corrals, mare barns, hay barns, a feed mill, and an indoor riding arena. With the completion of the capital improvements, the farm will accommodate almost any increase in enrollment which might arise. The farm has seen many improvements other than capital improvements. Many fences and roads were rebuilt, buildings repainted, and trees planted. In general, the farm has taken on a new look.

Facilities do not make a farm, institution, business, or individual credible; rather programs do. Therefore, in 1975, the Farm Superintendent evaluated all areas and found the following:

1. Dairy: Approximately 100 well-managed grade Holstein cows subsisting on poor quality feed. The cows were bred to semen from unproven bulls furnished free of charge by Kansas Artificial Breeders Service Unit at Kansas State University.
2. Beef Cattle: Approximately 200 beef cows of which over half were eight to ten years of age. All cows were supposed to have been bred but upon rectal palpation it was found that almost 50 were open. Feed was of poor quality and in short supply.
3. Swine: The farm owned approximately 60 diseased, genetically defective sows. They were immediately sold, and the land was allowed to stand idle for two years before starting a new herd.
4. Sheep: Four ewes of unknown origin or breed which were sold as soon as possible.
5. Horses: Five horses of various sizes, shapes, and colors were found at the farm. They were sold immediately.
6. Cultivated Land: The land had been cultivated continuously for four years without benefit of fertilizer. The summer of 1975 yielded 20 bushels per acre wheat, 18 bushels per acre milo, and approximately 100 tons of alfalfa. Bindweed completely covered most fields.

The remainder of this report deals with changes in programs and areas that have taken place since 1975. It took hours of conversation, discussion, and planning to outline the programs which have now been implemented.

## DAIRY

The dairy has always been well managed and operated and was the easiest unit for the Farm Superintendent to evaluate. It was and is one of the top ten dairies in the state of Kansas and is nationally known. In 1975, a decision was made to breed all cows to semen from unproven bulls furnished free of charge by Kansas Artificial Breeders Service Unit. Since the farm was not financially sound, this arrangement provided another area in which expenses were reduced. Although it did not cost in the short term, longterm effects were devastating. Instead of breeding cows to 1,000 pound predicted difference (P.D.) bulls, the average P.D. of these unproven bulls was approximately 300 to 500 pounds. When a dairy is producing 18,000 pounds of milk per cow in 305 days, breeding to superior bulls is very important. Since the dairy was already being tested by the Dairy Herd Improvement Association (DHIA), the production of each cow was easily detected. Cows began to fail to meet the 40 pound per day standard and were culled. Therefore, in 1980, the Dairy Supervisor and Farm Superintendent decided to contract a bull stud which evaluates poor traits of cows and mates these cows to bulls proven to possess superior qualities in those traits. In addition, a minimum of 1,000 pounds P.D. was imposed on the system, such that no cow is mated to a bull producing heifers which will produce milk less than 1,000 pounds above their herd mates. This procedure insures that the dairy produces high producing cows with conformation that allows them longevity in the herd. In 1981, a greater number than average heifers were culled which will be avoided when the higher quality heifers begin to enter the herd.

### PROGRAMS AND PROCEDURES

Evaluation of facilities at the dairy revealed problems but none were critical except for the loafing shed. The compressors for the milk bulk tank were located north of the dairy and presented a problem by freezing during the winter. They were moved to the east side of the dairy and placed in permanent enclosure. The vacuum pump was replaced and the floor of the holding pen was roughed to give the cows solid footing and avoiding slippage. Free stalls were added to the loafing shed to avoid mammary injuries. Generally, the dairy was in good shape, a condition which can be attributed to the management of the Dairy Supervisor.

A condition, beyond the Dairy Supervisor's control, was poor and inadequate feed. Dairy cows were receiving prairie hay and milo, both of which do not contain sufficient energy for the high production of a dairy cow. Alfalfa was purchased and the grain ration changed to 1/2 corn and 1/2 milo, which provided sufficient energy. The milk production immediately increased by 1,500 pounds per cow per year. Feed has been a problem since and will be discussed in the Cultivated Land section.



Goals of the dairy:

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## Goals of the dairy:

1. Maintain a herd of 100 dairy cows.
2. Produce as many registered Holsteins as possible, remembering that production and conformation are most important.
3. Cull each cow that doesn't produce 40 pounds of milk daily within two months of freshening.
4. Include a small herd of colored breed, e.g., Jersey, Brown Swiss or Guernsey to give students a view of an alternate breed. This will also increase the average butterfat percentage of the herd.
5. Increase the DHIA rolling herd average to 20,000 pounds per cow per year. This must be done with milking management, sound breeding practices, and good quality feed.
6. Show the best cows in shows in close proximity to the farm. This will advertise the farm and give students experience in showmanship.
7. Identify superior cows and when possible transplant their ova into lesser quality cows. This procedure increases the genetic worth of the herd much faster.

Each cow is mated on paper before the breeding season; that is, the bull is selected before hand. For the last two years, the Simmentals have been artificially bred to Gallant, one of the best, if not the best bulls in the breed. Our goal is to build a herd of cows, each being a daughter of Gallant. Our next cross is undetermined, but we have narrowed the field down to two or three bulls. We breed artificially for 45 days and complete the 60-day period with a bull we purchased, a son of Alpine Polled Protol. His calves are excellent.

The Herefords are bred to a bull owned by the C-K Ranch called 644, a lineage bred bull. Here again, our goal is to produce an entire herd of 644 daughter, all alike. The C-K Ranch has sufficient capital with which they can purchase top sires in the industry, and Fort Hays State University is allowed to use these bulls free of charge when necessary.



The Red Angus poses a problem, in that sire identification is more difficult. Their association does not, as of yet, maintain the voluminous records that other associations do.

All 200 beef cows were individually inspected for bad teeth, pregnancy, and general health. They were heavily culled for the first year and accurate records were maintained on the remaining cows so that the Farm Superintendent could get a feel for their performance. They were of varying mixed breeds and their performance was difficult to determine. It was decided that Simmental was the most predominate breed of the herd and the most logical breed for the area and to that end, the cows were bred artificially to Simmental bulls.

In 1980, the farm entered into a purchase lease contract with the C-K Ranch of Brookville, Kansas whereby it purchased 45 registered Hereford cows and leased 50 additional first-calf cows of the farm's personal choosing. This provided a genetic pool of 95 of some of the best Hereford cows in the nation. In the meantime, the farm had raised 50 registered Simmental cows and had purchased eight registered Red Angus cows. This provided a herd with three body styles for students to view.

All of the animals are now carefully selected for performance and each trait is recorded and analyzed by computer. The Hereford records are analyzed by the total performance record program of the American Hereford Association, Simmentals are treated the same by the American Simmental Association (S.M.I.L.E.) and Red Angus are calculated by the Red Angus Association. Replacement heifers are evaluated and selected for the following traits: birth weight, weaning weight, yearling weight, conception rate and the weaning weight of her first calf. If a heifer falls below herd average in any one of these traits, she is shipped to market. The record of each cow is carefully calculated annually and is culled if it is below standard in reproduction or low production. By 1984, the farm should have a herd of sound, viable fertile females that will wean calves at least half their weight in 205 days. Our goal is to wean a calf  $\frac{2}{3}$  of a cow's weight in 205 days.

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The Red Angus poses more of a problem, in that sire identification is more difficult. Their association does not, as of yet, maintain the voluminous records that other associations do. Therefore, we have been using Galena with some success. Although Red Angus is nice to see, there might come a day when the Farm Superintendent deems it necessary to eliminate Red Angus. However, Red Angus-Simmental crosses make excellent animals and it remains to be seen. These crosses should provide red color, marbeling, growth, and viability that many other crosses do not possess. One can consider this phase of the program at the experimental stage.

The advantage of more than one breed is that of heterosis during cross-breeding. Below average Hereford and Red Angus cows bred to Simmental, thereby, increasing weaning weights of their calves. This tends to equalize the herd, and even if heifers are not kept for replacement, their cross-breeding demands a premium at the market place.

By 1984, our goal is to sell bulls to farmers and ranchers; and to produce our own top bulls. At that time, we could possibly close the herd outside influences and operate on our own merits. We will also be in the position to sell replacement females which demand a premium (\$1,500 each vs \$800 each). Good registered bulls will bring more at market place than commercial calves (\$1,000 each vs \$450 each). The breeding program has been scrutinized by well-known cattlemen such as the C-K Ranch manager, Sam Paylor, and Bob Dickinson, national president of the American Simmental Association.

The farm conducts some research in beef cattle, as long as it doesn't cost too much nor upset the cattle. In 1980, the cows were injected with an agent to hopefully cause them to come in heat all at once which was mildly successful. The results appear in KSU's bulletins. However, during 1981, the cows were again synchronized and 72 of 75 were bred in 12 days which is far above average. KSU will use this data also.

Long-term goals for beef cattle:

1. Maintain a herd of 150.
2. Produce a calf weight  $\frac{2}{3}$  of its weight at weaning.
3. Produce our own herd of bulls.
4. Provide the general public with genetics to increase the overall efficiency of beef production by selling them replacement heifers and bulls of superior quality.
5. Provide the general public with management tips and tools to increase the efficiency of their existing herds. This includes nutrition, health, and genetics.
6. Identify superior cows and when possible transplant their ova into lesser quality cows. This procedure increases the genetic worth of the herd much faster.



## SWINE

The new herd was established using eight registered Hampshire gilts donated to the farm by a Fort Hays State University graduate. Since then, special crossbred gilts have been used along with ten registered Yorkshire gilts which were purchased in 1980. The two registered lines will be maintained using the best boars available. For commercial pigs, these two lines will be crossed producing an F1 gilt that is both meaty (Hampshire) and prolific (Yorkshire). A third cross with Duroc boars will produce pigs ready for market. Here again, sows are being carefully selected for prolificacy, conformation, and weights of the pigs.

Sixteen pigs were slaughtered in the spring of 1981 and they all yielded USDA No. 1 with very little backfat (< 1"). P & B ackers insisted those were the best pigs they had ever slaughtered and paid a premium over Omaha market top. Within two years, the University will be a leading hog breeder.

Fort Hays State Is using artificial insemination to some extent in swine. However, A.I. is a new procedure, and we are afraid that the best boars are yet to be identified. If we are proven wrong, most of our herd will be bred artificially and resident boars eliminated. Eventually, we will be producing our own boars for collection and artificial insemination purposes.

### Goals for swine:

1. Maintain a herd of 80 to 100.
2. Wean an average of nine pigs per litter.
3. Produce pigs with a five to six inch loin eye, < .5" backfat, and weigh 210 pounds in 145 days. Both boars and gilts must have six teats per side, but seven is preferable.
4. Sell boars and gilts to farmers in the area, thereby, providing superior genetics.
5. Take an occasional boar or gilt to shows and sales, advertising and its quality of livestock. This will in turn advertise our agriculture program.
6. Maintain two registered herds and a crossbred commercial herd using the registered breeds for proliferation and the crossbred herd for market and test animals.



## SHEEP

Ten registered Suffolk ewes were donated to the farm in 1978, and the farm purchased ten Rambouillet ewes in 1980. Twenty-two ewes were raised by the farm during that time - but of the entire flock they were of mixed breeds and their production was substandard. Therefore, the quality was not quite suitable for University purposes, and the farm personnel began searching for a deal such as the one offered by the C-K Ranch.

In 1981, the farm leased 30 Suffolk ewes from Willis Rieman, a leading breeder and 50 Columbia ewes from Lee Jarvis, a nationally-known breeder in Utah. The Columbia Association was the fastest growing breed association in the U.S. last year, and Fort Hays State University has the opportunity to become one of the nations leaders in this breed within two to five years.

Special care will be taken to apply the same selection pressure on replacements such as twinning rate of ewes, birth weights, and weaning weights of their lambs that is occurring in the cattle. As in the case of the bulls in cattle, rams will depend on premium at the market place (\$1,500 vs \$250).

## Goals for the sheep:

1. Maintain a flock of 75 ewes including two breeds of superior quality sheep.
2. Produce 12 pounds of wool per ewe from Columbias and 10 pounds of wool per ewe from Suffolks.
3. Produce 110 pound lambs in 160 days.
4. Raise at least 150 percent lamb crop.
5. Provide quality sheep and management practices for the increasing number of students interested in sheep production. (Sheep production in Kansas has increased five to seven percent per year for the last two years.)
6. Produce quality breeding stock for sale to other breeders and commercial sheepmen across the country.

## HORSES

After much discussion, it was decided that Western Kansas does not need a show horse nor can it use racing blood. Rather the working horse is more logical. Therefore, a band of broodmares with King Ranch of south Texas, and Oklahoma Star bloodlines were assembled.

The farm leased a stallion, Error Leo Bar, with Leo and 3 Bars breeding providing an outcross for those mares. Colts by this cross have been tremendous and have been sold for as much as \$2,500. Since the stallion is 17 years old and must be replaced soon, the farm is looking for a King Ranch bred young sire. He should cross very well on Error Leo Bar daughters producing colts with excellent conformation action.

The farm is looking to the cutting horse arena for publicity and has already begun to attend the shows with horses of the same breeding but owned by the farm crew. No one on the farm has any intention of expanding the mare band beyond 10 mares but those will be some of the best in the industry.

Goals for the horses:

1. Maintain 10 mares.

was 1. Maintain 10 mares. During the year, preferably two to four weeks before planting time. The milo ground is sprayed late enough in the spring to kill bindweed but early enough to avoid carry-over of the agent and not effect the young grain sorghum plants. Bindweed will be a very long-term problem on the farm because of the length of time it has been there and the extensive coverage it has. If a new effective control is produced, its use would be well worth the money even if it is extremely expensive. Many man hours and a great deal of money are spent every year using conventional methods which are not as effective as they could be. However, in spite of the bindweed problem, good land management has almost doubled production of all crops. In 1980, the wheat crop yield was 40 bushels per acre while the milo yielded 42 bushels per acre and 1980 was considered a dry year. The winter of 1980-81 was very dry and mild and the wheat suffered from every insect and disease imaginable, yet it yielded almost 30 bushels per acre. It was due to the excellent land management of the Farm Foreman.

Goals for the cultivated land are as follows:

1. Reduce bindweed on all cultivated land and pastures.
2. Rebuild all terraces and waterways.
3. Reduce tillage where possible to save energy and fuel. This may or may not be possible due to the excessive bindweed.
4. Replace machinery when possible, thereby reducing repair costs.



## 5. Routinely CULTIVATED FARM 40 bushels per acre.

### 6. Replant alfalfa stand where necessary and raise at

Inventory and evaluation of the cultivated farm and shop revealed a real problem. Since the Farm Foreman was on disability leave, the machinery was in very poor repair. Many machines were old and even new ones were not field ready. The summer of 1976 was a total wreck but in the spring of 1977 another Farm Foreman was hired, one who could not only manage cropland, but could repair almost anything. Within two years most major repairs were completed and the machines became more dependable, although they were still old.

Since the cropland had not been fallowed for four years, it was divided into four areas. One area was designated as forage sorghum land and was and is fallowed every other year. This promotes bindweed control and moisture conservation for the coming crop. It also helps to insure that at least some forage sorghum will be cut and put into the silo which is very important to the dairy. The dairy requires at least 700 tons per year.

The remaining ground was broken into thirds to be in the following crop rotation: wheat, grain or hybrid sorghum, and summer fallow. Since bindweed covers some of the fields, an intensive control program was instituted and during 1980 almost \$5,000 was spent for 2-4-D. The summer fallow is sprayed at least once during the year, preferably two to four weeks before planting time. The milo ground is sprayed late enough in the spring to kill bindweed but early enough to avoid carry-over of the agent and not effect the young grain sorghum plants. Bindweed will be a very long-term problem on the farm because of the length of time it has been there and the extensive coverage it has. If a new effective control is produced, its use would be well worth the money even if it is extremely expensive. Many man hours and a great deal of money are spent every year using conventional methods which are not as effective as they could be. However, in spite of the bindweed problems, good land management has almost doubled production of all crops. In 1980, the wheat crop yield was 40 bushels per acre while the milo yielded 42 bushels per acre and 1980 was considered a dry year. The winter of 1980-81 was very dry and mild and the wheat suffered from every insect and disease imaginable, yet it yielded almost 30 bushels per acre. It was due to the excellent land management of the Farm Foreman.

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5. Routinely produce wheat at 40 bushels per acre.
6. Replant alfalfa stand where necessary and raise at least 500 tons of hay per year. This would reduce feed costs for both the dairy and beef.
7. Produce enough feed for a year's supply in advance. After harvest there should be two years of feed available.

Most of the work mentioned in the above report is administered by the Farm Superintendent but day-to-day decisions and tasks must be accomplished by the respective managers. An overall result of the evaluation indicated that the one person was responsible for too much and too little attention was directed toward any one area. Now there are four managers, each responsible for his area as listed below:

Farmer III - Dairy: No degree but has 38 years experience.

Farmer III - Shop and Cropland: Graduate of Vo-Tech school (Major - Diesel Mechanic) and a great deal of experience in farming.

Animal Caretaker II - Swine and Sheep: Graduate of Fort Hays State University with a great deal of livestock judging experience.

Animal Caretaker II - Beef and Horses: Graduate of Fort Hays State University and has worked on a large Commercial ranch before returning to the farm.

Since time is of the essence to the Farm Superintendent, he must rely on these managers for their dedication, expertise, and dependability. In the event one leaves, his replacement must be carefully selected. These people will be called upon to help teach students the practical aspect of agri-business. Therefore, they must be knowledgeable and articulate in imparting their knowledge. These persons are indeed rare and will probably come from the ranks of the student body. Therefore, the farm is not only a training ground for students but it is a stepping stone for aspiring young managers.



## FARM SUPERINTENDENT

The Farm Superintendent is constantly supervising to make sure that everything is completed on time. He coordinates classes with the academic personnel when necessary and approves major purchases. His is a somewhat political position - an "extension person" for Fort Hays State. The more people in the area he knows, the easier it is for him to operate. On occasion he will be expected to conduct tours for dignitaries, visiting with a knowledge of the operation to add credibility to the tour,

He must set goals and priorities for the area and he is responsible for establishing salaries for the staff. He hires and dismisses both civil service and student labor. Although students are usually hired and dismissed by the respective managers, the Farm Superintendent must approve each transaction.

Most of the goals listed below were proposed by cooperative efforts between the Farm Superintendent and his managers. Some of the goals that do not precisely fit any area are as follows:

1. Hire competent managers and expect them to manage their respective departments efficiently and with dedication.
2. Install water systems to pastures to demonstrate better utilization and greater growth of livestock.
3. Clean out ponds, to demonstrate proper pasture management and to conserve water.
4. Insure that modern pasture management practices are being observed.
5. Oversee cultivated land management.
6. Maintain costs of operations for all areas and be able to convey these costs to various groups. Many costs mentioned in reports are estimated and the University farm is in a position to accurately calculate them.
7. Constantly observe all operations, seeking the most efficient method; one that will reduce costs and labor, yet serve the academic community adequately.
8. Provide livestock and facilities for 4-H, University and interested persons to judge and evaluate. Use livestock as a teaching tool for everyone who attends or visits Fort Hays State University.
9. When economically feasible implement and evaluate energy conservation practices to make the entire operation a model farm. This can be done by installing methane digestors, geothermal tubes, heat exchanges in the dairy, wind generators, and solar panels. Two requests for government grants were submitted in 1981 to begin the project.