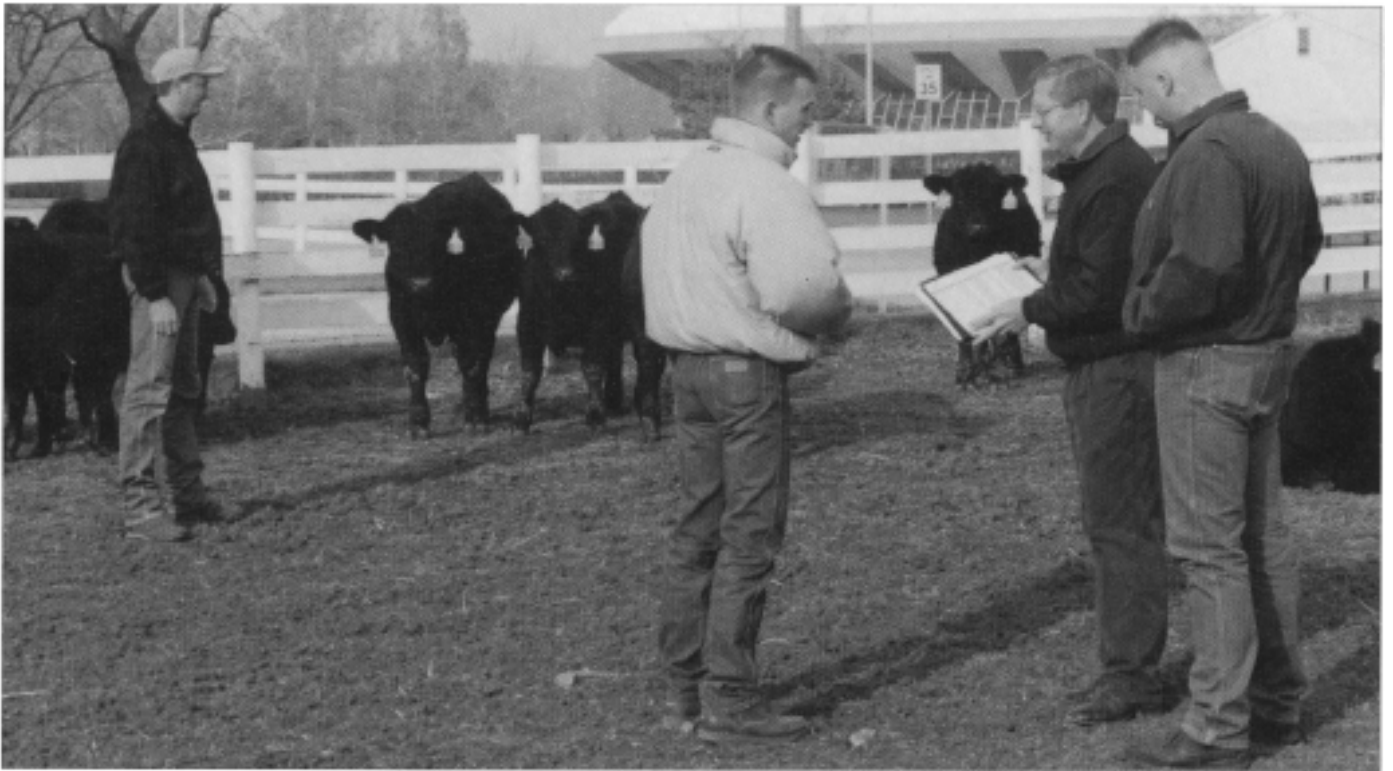


Angus herds and genetics play an important role in teaching, research and beef production at land-grant universities across the country.

In part III of our series, we feature the beef programs of the University of Illinois, University of Missouri and New Mexico State University.

CONTINUED ON NEXT PAGE



Checking performance records on the University of Illinois Angus calf crop are (l to r): Steve Myers, Alan Miller, Doug Parrett and John Dickinson. Parrett leads the U of I beef research and production unit.

Angus cows at the University of Illinois farms appear like Angus cows on just about any Midwest farm. The difference is these cows are the subject of research and teaching projects that could lead to discoveries to improve the beef industry.

The University's Angus cow herd was started in the 1920s. Al Neuman, professor emeritus, helped develop and build the herd from the 1950s through the early 1970s. At that time, the cow herd also included Hereford and Shorthorn.

"In the mid-1970s we decided to go to one purebred breed to make our genetics more uniform for research," explains Illinois animal scientist Doug Parrett. "We preferred a greater number of one breed over fewer numbers of several different breeds."

Indeed, the Angus herd has increased during the last 10 years. The University research herd at Dixon Springs, located

in southern Illinois, has expanded to 600 Angus and Angus-cross females. In 1991 a new research center near Perry, Ill., allowed for the addition of 120 cows. Then in 1994 the University expanded its Angus herd on campus to 100 purebred females.

That adds up to enough cows for a solid research base. "It allows us to be involved in research through the whole beef production system," Parrett says. "All of our purebred cattle are used in applied research. We have enough numbers to conduct cow-calf research, feedlot production research and research in meat product analysis."

Perhaps the most exciting research project is one headed by Dan Faulkner, professor of animal science, and postgraduate student Steve Myers. They're researching the effects of early weaning of beef

steers on carcass quality and performance. Myers is pursuing his doctorate with this project and is encouraged by results so far. Preliminary results have indicated steers weaned early, such as 90 and 120 days versus the traditional 205 days, marbled 30 percent higher at market weight.

Parrett knows the value such information could have to Angus breeders and the Certified Angus Beef Program. Myers has also noticed improved cow body condition and conception rates in the dams of those steers.

This is just one research project involving the Angus herd at University of Illinois. "Our research projects analyze several beef production systems," Parrett says. "This is possible because we have

enough numbers of cattle of similar genetics to study variables, and that allows us to integrate pieces of research more expertly."

Another U of I research project is led by Alan

Miller, a former director of the National Junior Angus Association (NJAA). Miller's interest in cattle was sparked by his family's Angus herd and his own junior

Angus projects. His master's project examines the effects of limit feeding a high concentrated diet to beef cows and developing heifers.

The University's research projects are further complemented by a federally funded biotechnology center on campus where Harris Lewin is working on beef genome mapping.

"In our research thrust,"



Parrett says, "we are trying to solve applied research problems as well as make basic discoveries that will lead to new technology for our industry."

With a growing Angus herd, the University's need for semen, particularly from easy calving sires, has increased.

"We are fortunate to be able to do sire progeny testing for Angus breeders," he says. "We get semen from their top young sires and they help fund some of our applied research programs."

Roy Wallace of Select Sires, Plain City, Ohio; Brian McCulloh of Woodhill Farms in Wisconsin; Chuck Brost of Brost Angus Farm in Indiana; and Joe Davis of Davis on the Highlands in Kentucky have recently cooperated with the University for sire progeny testing.

"This really improves our herd by allowing us to utilize top genetics in a cost-effective method," Parrett says. "And the breeders get back relevant growth and carcass data."

NJAA Board chairman John Dickinson, a junior studying animal science, grew up on an Illinois Angus farm and hopes to pursue postgraduate work in cattle research. In the meantime, Dickinson, like other U of I undergraduates, works with the Angus herd through several classes.

"Our purebred cattle are used in beef production and animal evaluation classes," Parrett says. "Students get a chance to evaluate animal type and performance record programs. Plus, students get real hands-on experience."

Every spring students involved in the University's calf watch course get practical experience checking cows and assisting cows with calving.

Through lab course work, students work with the show and sale cattle. Those students are responsible for animal

preparation, recordkeeping, entry paperwork and attending the event with the cattle. Today the University only exhibits cattle at state shows and sales, but in the past steers were exhibited at the Chicago International.

That's where the animal science department's mascot, Broadus White Socks, gained his fame. Broadus White Socks was the grand champion steer at the 1923 International. Exhibited by A.A. Armstrong, Camargo, Ill., the steer was purchased by Sears & Roebuck Company, which toured him throughout the nation and in Europe. Sears & Roebuck had the steer stuffed and presented it to the University.

Illinois will soon offer its first livestock merchandising class. Here students will learn about marketing while planning the University bull sale. The first sale is planned for 1998.

The University also supports the state Angus industry by cooperating with the Illinois Angus Association to organize and host the Illinois Spotlight program. During fall sales, Angus breeders can nominate consignments as Spotlight calves. Purchasers of those designated calves are then eligible to attend the Spotlight program held at the University. The program consists of a half-day of mini classes on general beef management, a show, demonstrations and fun events for junior exhibitors.

Parrett says the Illinois Spotlight, now in its 20th year, has fostered a lot of good feelings toward the Angus breed in Illinois. Attendance averages about 150 people, including moms, dads and youth exhibitors.

"About half of the attendees are exhibiting their first project," Parrett says. "We often hear that people bought Angus because they liked the Spotlight program



This pen-of-three Angus steers took first place honors at the 1958 Chicago International for the University of Illinois. Herdsman D. L. Taggart (left) and two unidentified students are at the halter.

and the strong support of the state and junior associations."

In addition to its role in research and teaching, the Illinois Angus herd is further utilized through the University's Extension program. The newest Extension project, Beef 2000, is a cooperative effort with the Illinois Beef Association to teach beef producers more about their end product.

Beef 2000 was adapted after a National Cattlemen's Beef Association program and

addresses market steer and beef product evaluation.

"Many beef producers don't understand quality grades, yield grades and the whole carcass and meat end of our business," Parrett says. "Beef 2000 is designed to take them through the whole system. We evaluate live animals, learn to quality and yield grade carcasses, cut up a side of beef, and also do taste panel work. It's really a short course in learning about the product they produce."

— Susan Shoup Grebner



Broadus White Socks, the 1923 Chicago International grand champion steer, still serves as a mascot for the University of Illinois animal science department. Shown with the famous stuffed steer are (l to r): Steve Myers, Alan Miller, John Dickinson and Doug Parrett.

Increasing the profitability of Missouri beef operations is the objective of the new Beef Focus Team. Located at the University of Missouri in Columbia, the team is a combination of Extension and Commercial Agriculture faculty.

Still in its infancy, the team is composed of six specialists. Each team member brings a different expertise to the table including economics, nutrition, genetics, reproduction and health. The blending of their expertise allows for the development of more comprehensive producer programs.

"The idea is to use a systems approach looking at beef cattle management," says team member Dr. Bob Larson, Extension veterinarian.

In many cases if a producer has a problem, he'll call a University or Extension specialist for assistance. In return, the specialist will make suggestions related to his or her speciality. With the team approach a producer's problem



is looked at from all angles — management, economics, health and nutrition. The team works together evaluating all possible solutions when developing a management program.

Most university specialists don't have the opportunity to work closely with their peers in other areas of beef production.

Dr. Richard Randle, Extension veterinarian, says the team approach is a unique and wise arrangement.

"It gives you the opportunity to put all pieces together when working with a producer," he says. "You can't be an expert in all areas; this allows you to rely on others in the group to supply that information."

The Beef Focus Team will



University of Missouri Beef Focus Team members seated (l to r) are: Rex Ricketts, coordinator of the Commercial Agriculture Program; Dr. Richard Randle, Extension veterinarian; and Monty Kerley, ruminant nutrition specialist. Standing (l to r) are: Vern Pierce, Extension beef economist; David Patterson, reproductive physiology specialist; Dr. Bob Larson, Extension veterinarian; and William Herring, Extension beef geneticist.

link their expertise and develop models for different segments of Missouri's beef industry. These models will be a tool for producers to use in developing their own profitable management plans.

For example, team members Vern Pierce, Extension beef economist, and William Herring, Extension beef geneticist, will be working on a decision-making tool that will allow producers to identify bulls which will produce the most profitable progeny.

The idea is to weigh each of the biological traits or, more directly, the expected progeny differences (EPDs) by economic value. The EPDs and economic values are then combined to form an index ranking bulls for profitability. Even though the technology is not new, there is no tool or software available to beef producers to utilize this approach in their selection program.

The team will also organize and facilitate comprehensive workshops. They hope to offer these integrated workshops, including hands-on labs three to

five times a year, in Columbia and around the state. These seminars will target producers and other related audiences including veterinarians, feed suppliers and other allied industry professionals.

The group will also work to develop more opportunities to aid Missouri beef producers in marketing their animals.

One pilot project in the drafting stage is a replacement

heifer program. David Patterson, Extension beef specialist, says the plan is to implement an educational program focusing on better methods of developing replacement heifers. The program will look at heifer nutrition, health, reproduction and mating decisions.

If the two pilot projects in southwest and northeast Missouri are successful, they



Team members do on-farm visits and work one-on-one with Missouri beef producers to evaluate their management programs. Dr. Bob Larson, Extension veterinarian (far right), and Eldon Cole, regional Extension livestock specialist (far left), visit with two commercial cattlemen about their health program.

THE COMMERCIAL AG PROGRAM

The Commercial Agriculture Program was initiated in 1987 when the Missouri Legislature appropriated money requested by the University of Missouri. The program is designed for farms where a substantial part of the family's income is from farming and agricultural businesses that support those farms.

Early in the program's growth it was decided to develop a focus-team or systems approach in order to help agricultural producers consider all aspects of crop and animal production.

The swine industry was selected for the first focus team. Following swine were crops and dairy focus teams. In September the beef team was the last to be initiated. They are currently in the process of filling

plan to expand the program into other areas of the state.

Another project the team will work on is developing a manual focusing on the solutions to common beef management situations.

Randle says the manual will be different from traditional Extension information. Their manual will offer what appears to be the best alternative, compared to "these are possible solutions."

A lot of their time will be spent assisting individual producers. The team agrees their overall goal is not to become a producer's full-time consultant, but to help them evaluate where they are and assist them in developing a business plan so they are set up for the 21st century.

Larson says they want to help producers before their farms get in trouble, doing more forward planning problem solving instead of "banker beating on your door" reacting. The group wants to set up management plans that will aim producers in the right direction with their heifer development, genetics, marketing strategies and health programs.

"In addition to comparative analysis, what we want to do is bring in the beef production executive and evaluate where

the farm is at from a family, farm, financial and production standpoint," Vern Pierce says. "Then what we do is blend each of our disciplines to figure out where we might optimize each of those four categories."

As the team works with a producer they will bring in allied professionals to serve as consultants. Pierce says they'll develop a corporate-like structure so the producer will have access to an Extension specialist, feed dealer, banker, veterinarian and others to help make future business decisions.

An example situation would be a producer who wants help developing a strategy to reach goals set for his or her cow herd in five years, or if a producer has children who want to come back to farm. The team will look at the situation and work to improve the farm's position.

Jay Truitt, executive vice president of Missouri Cattlemen's Association, is excited about the Beef Focus Team and how it will help Missouri's largest agriculture sector.

"They've brought in the best people in the country," Truitt says. "They know how to talk with producers, they know the cattle business and they like to be around cattle. We consider them an excellent resource."

-Angie Stump Denton

two more positions — another nutritionist and a forage handling engineer.

The University of Missouri is the first institution to take this approach to Extension. The team also works with the 27 Extension livestock specialists around the state of Missouri.

"The main reason this concept was started was to improve the livelihood and viability of agriculture in Missouri," says Dr. Bob Larson, Extension veterinarian. "Commercial agriculture is the business of producing food. And we need to treat each of our farms and ranches as a business. We (the Beef Focus Team) have been put together to do that effectively by looking at economics, genetics, forage, health and reproduction with a complete commercial application for beef production."

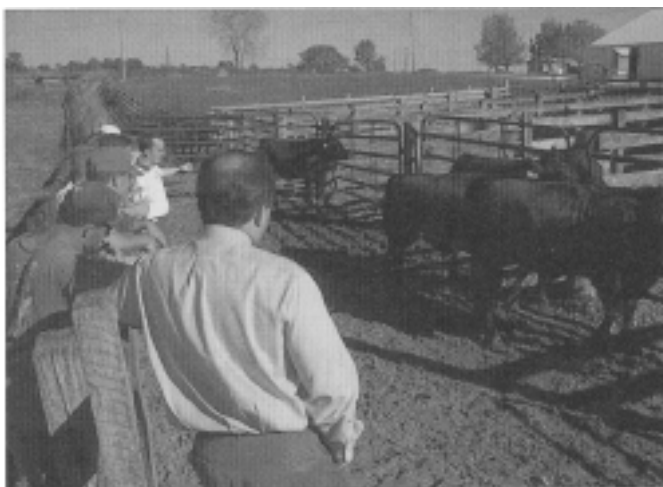
Breeding Angus since 1919

A member of the American Angus Association since 1919, the University of Missouri has a strong tradition in raising Angus cattle. In the 1970s the University managed more than 100 registered Angus. Over the years this number has declined as research moved more towards using crossbred cattle.

Today the University maintains a herd of 15 registered Angus females used for teaching purposes. The University also has an Angus-based herd of commercial females which is used for research purposes at several experiment stations located throughout the state.

Angus are being used in a current research project by William Herring, Extension beef geneticist. He is researching the response of selection for high and low scrotal circumference expected progeny differences (EPDs) to reproductive traits.

Herring selected seven Angus bulls, three low scrotal circumference EPD bulls and four high scrotal circumference bulls with similar yearling weight EPDs. The bulls were randomly mated to 80 straightbred Angus females.



The Angus herd at the University of Missouri is used for teaching purposes. Students have the opportunity to work with the cattle during class labs. Pictured here, the University livestock judging team works out with a class of Angus steers.

Breeding efficient cattle that will survive the harsh winters and dry, hot summers is the goal of New Mexico State University (NMSU). Meeting this goal are Angus cattle.

The University manages a herd of 25 Angus on their ranch near Carona in the high piñon, juniper and grassland of central New Mexico. Because of severe drought conditions the Angus herd was moved 200 miles north from the University Ranch near Las Cruces to the current location in 1990.

Selecting for efficiency of traits, not maximization, has been Neil Burcham's theory since he started managing NMSU's Angus herd in 1986.

"I want a herd that is labor free and has a 100 percent calf crop," Burcham says.

To achieve this, Burcham breeds cattle which will thrive in their environment, selecting for low birth weight, low milk and optimum growth. Easy calving, low input, disease resistant females are what comprises NMSU's herd.

The Angus serve as a source of bulls to use in their research projects and secondly as a teaching tool for beef production and other University classes.

The Angus herd was developed at NMSU in the mid-1970s for use in a crossbreeding study. New Mexico Angus breeders who donated animals to initiate the herd were Frankie Flint, Tucumcari, and Charles Pruitt, Crossroads.

Today only one female in NMSU's herd is not University bred. Although they maintain a fairly closed herd they infuse new genetics by the use of artificial insemination (AI). They AI all of their Angus females using sires that meet their selection criteria. Bulls used in their program must have a birth weight expected progeny difference (EPD) of less

than 0 and a milk EPD of between 0 and 10.

"We select against milk," Burcham says. "Milk is second hand grass; heavy milkers need more grass." Because of the lack of rainfall and feed, lighter milkers will survive better in their area of the country

Gene Parker has been the University's cattle ranch superintendent for more than 30 years. During his tenure with the University he has found it's important to raise females which adapt to their environment and management.

"We need females that can survive on low inputs and low supplementation," he says.

Other important traits in their part of the country are calf vigor, temperament and longevity.

"Longevity is very important," Parker says. "With the cost of developing replacement heifers they need to last 10 years in our herd."

Burcham says another important trait is unassisted births. Their heifers and cows need to be able to lay down and have a calf without any assistance. If they can't they'll probably lose their calf, possibly die themselves or find themselves on the way to the sale barn. NMSU is currently using a bull that has had zero assists being bred to 100 first-calf heifers.

With extreme temperature variations ranging from below 0° F. in the winter to above 100° F. in the summer, immunity to sickness is important. They use an aggressive vaccination program and with selection they decrease the susceptibility to sickness. They do not use bulls which showed excess stress during the weaning process.

Data is collected on all Angus offspring and reported to the Angus Herd Improvement Records (AHIR) department of

the American Angus Association. Burcham believes this practice is an important and viable process. He uses the data to chart the improvement of their herd.

Since 1987 they have lowered their birth weight EPD from 1.8 to .4, while increasing yearling weight EPD from 10 to 31.

Burcham aggressively culls the NMSU herd to increase efficiency. Any females who do

heavier than the herd average. He'd like to see a female wean a calf that weighs more than 50 percent of her body weight.

With an average annual rainfall of less than 14 inches and at an elevation of 6,000 feet, NMSU cattle have to survive on little grass and with an extreme range of weather conditions. Burcham says elevation has more effect on weather in New Mexico than latitude.

Before calving and until the grass is green, the herd is supplemented minimally. Although the cows don't receive high levels of energy during this time, NMSU has an impressive post-partum conception rate. Since 1990 they've only had three open females.

During their 65-day breeding season in 1996 they had no rain and their cattle had average body condition scores of three, but they still had a 100 percent conception rate.

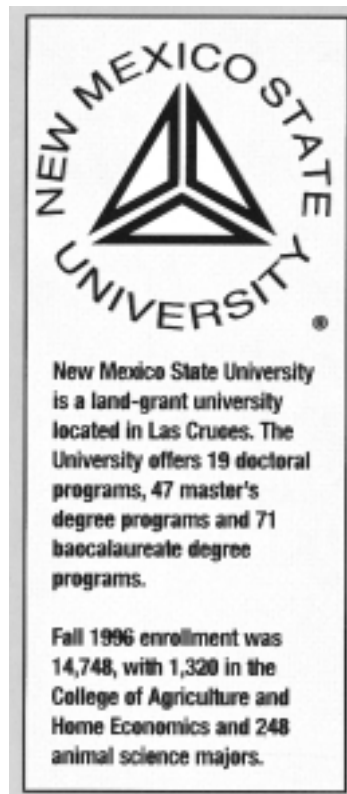
The cow herd begins calving in late January. First-calf heifers are managed by the students in the beef production class at the University.

After weaning, the calves are shipped to Las Cruces. The heifers are placed on irrigated pasture for development and AI. The heifers are shipped to Carona for summer grazing and return to Las Cruces for calving.

Bull calves are placed on a feed test. After coming off test the University selects bulls for its commercial herd and a cleanup bull for the Angus herd; the remaining bulls are sold in the University sale managed by NMSU students.

The sale is held in April at the NMSU Horse Farm in Las Cruces. The students help organize and conduct the bull and Quarter Horse sale.

Although Burcham would like to see the Angus herd size increase, with current market prices he doesn't see expansion



not calve by 25 months of age and who need help during the birthing process are culled.

Because of their dedication to collecting data and strict selection criteria, the University each year has several cows named Pathfinders by the American Angus Association. In 1997 Burcham predicts they will have more than five cows meet the Pathfinder standards.

Ideally, Burcham would like all of NMSU's cows to be Pathfinders — calve before 24 months of age unassisted, calve every year and wean a calf



ANGIE DENTON PHOTOS

(above) Managing New Mexico State's Angus herd from (l to r) are: Shad Cox, research technician; Gene Parker, ranch superintendent; and Neil Burcham, University professor. Cox and Parker live near Carona and manage the day-to-day operations of the ranch.

of the herd any too soon. The University also has 270 head of commercial cows and 80 replacement heifers at the Carona ranch, and has a herd of Brangus at the University Ranch near Las Cruces.

As the herd progresses, Burcham wants it to become known as a source of labor free, fertile, low-cost cattle. He wants to supply bulls for producers in their area that will excel in New Mexico's challenging environment.

-Angie Stump Denton



NMSU's Angus herd has to survive the harsh winters and hot, dry summers of central New Mexico, Raising cattle that are labor free and have a 100 percent calf crop is the University's management goal,