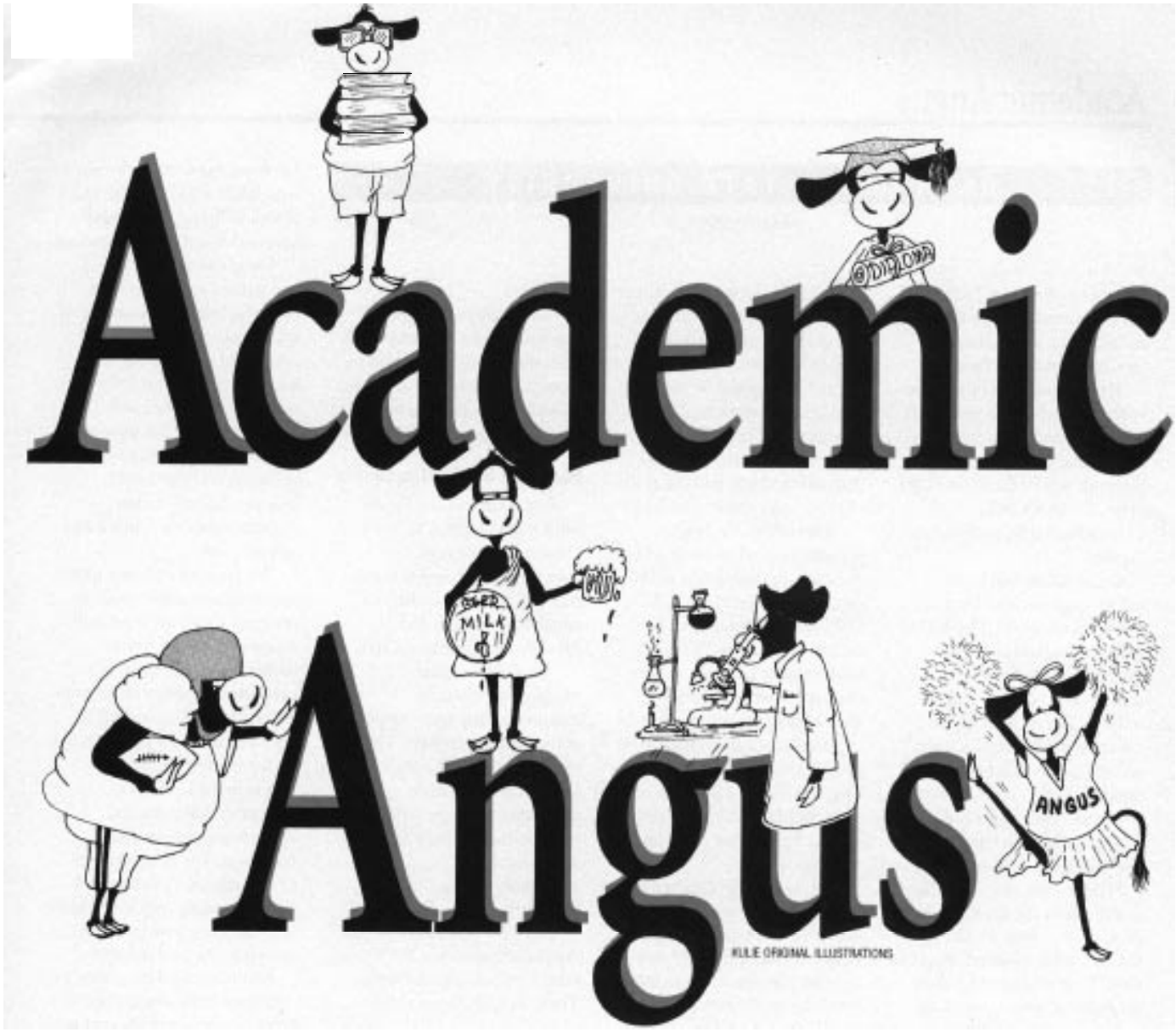


Angus herds and genetics play an important role in teaching, research and beef production at major land-grant universities across the country. In part II of our series we feature the beef programs of Oklahoma State University, the University of Wisconsin and the University of Wyoming.

OKLAHOMA STATE UNIVERSITY

Stillwater

To state producers, Oklahoma cattle are dollars on the hoof; to Oklahoma State University, they are laboratories on legs.

The development of methods which will help cattle producers meet industry, consumer and operational profitability demands will be the focus of the new OSU Beef Cattle Environmental Stress Research Facility.

Construction will begin following groundbreaking ceremonies Sept. 14. The million dollar facility will be located west of the Stillwater campus, near the OSU Dairy Center.

Don Wagner, head of the department of animal science, says the facility will have a significant effect on the creation of new technology for beef producers, both in Oklahoma and across the United States.

"Historically, OSU has played a vital role in the development of new technology for the nation's cattle industry," Wagner says. "New advances will allow the industry to be even more competitive, not only with other sources of animal protein, but in worldwide markets as well."

The Stillwater-based beef research facility will be world class, and will allow for closer monitoring of research programs by faculty, staff and students than was possible at the old Pawhuska research facility.

"Most of the Pawhuska projects were relatively short in duration and involved a good deal of labor," says Don Gill, OSU animal scientist and beef facility coordinator. "Using student labor will help keep costs down while enhancing their educational experiences."

Animals will be consigned by producers to the beef facility. This will allow for research on many head of cattle which are the exact types that make up state herds.

Gill says the development of lifetime production systems specific to the types of animals raised in Oklahoma is becoming increasingly important to the profitability of state cattle producers.

"The facility will allow for intensive studies on everything from sire and dam selection to management as a cow-calf unit to stocker programs to placing animals in the feedlot," Gill says.

Purebred Beef Cattle Center

Angus cattle are by far the most popular breed in Oklahoma. So it is no coincidence that Angus cattle play a pivotal role in the education, research and Extension programs of OSU.

"To make accurate recommendations for improving Oklahoma cattle herds, it's necessary for researchers and educators to have access to animals possessing the same genetic backgrounds as those raised by state producers," says Dave Buchanan, OSU professor of beef cattle breeding.

The OSU purebred beef herd consist of more than 200 brood cows representing six breeds. These include Angus and Hereford, the first two breeds established at OSU in the 1920s, as well as Brangus, Limousin, Simmental and Polled Hereford.

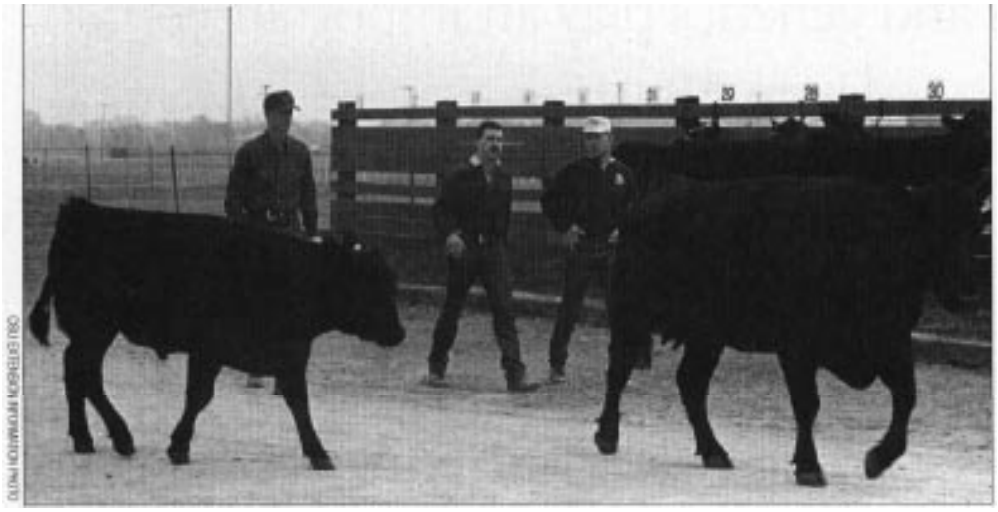
The mature cow herd is maintained at the purebred range facilities, which consist of approximately 2,000 acres of native and improved grasses, located northwest of Stillwater near Lake Carl Blackwell. The headquarters for the purebred center, located 3 miles west of Stillwater on Highway 51, includes the bull testing facilities, show barn, office and sale pavilion.

The primary objective of the purebred beef cattle center is teaching. Cattle are bred and raised at OSU to furnish students with examples of high performing, modern-type cattle which are used extensively in numerous courses taught in the department of animal science as well as in the Colleges of Veterinary Medicine and Agriculture and Natural Resources. The herd provides OSU students, as well as 4-H and FFA youth, with cattle and facilities to prepare them for careers in the beef industry.

Recommended programs for registered herds are applied to serve as a demonstration of up-to-date, practical management breeding and feeding of high quality purebred cattle. The cattle and facilities are not only utilized by more than 650 animal science students in various courses, but students are also employed in part-time jobs as part of the department's Career Development Program.

The Career Development Program permits 12 to 15 students a year the opportunity for part-time employment. These students' work hours are scheduled around classwork and other activities, typically allowing them to work 10 to 20 hours per week.

The purebred beef herd also serves the beef industry through continuing education such as type conferences, producer



OSU STEPHENS INFORMATION PHOTO

The OSU breeding program has earned nationwide acceptance. Each year, through national sales and the annual Cowboy Classic production sale in April, OSU merchandises seedstock to other registered herds and range bulls to commercial cattle producers from Oklahoma and around the country.

workshops and field days. For example, in mid July, a Beef Field Day is hosted which consists of a cattle judging contest and other educational events. Typical attendance at this event is 1,500 people, most of whom are Oklahoma 4-H and FFA students.

The beef herd, as well as the other animal science purebred herds and flocks, are a key part of the department's recruitment efforts. As a result of their use in numerous field days, livestock judging contests and other educational events, OSU cattle are viewed by more than 2,000 potential students each year. In addition to this, countless people see OSU cattle on exhibit at state and national shows.

Over the years OSU has compiled an impressive show ring record. This exposure has had a favorable impact on student recruitment. Many students choose OSU as the place to continue their education specifically because of the reputation for excellence in the purebred teaching herds.

Current enrollment in the department of animal science is the highest ever and has enjoyed several successive years of growth during a time when enrollments in animal science and ag-related majors have been decreasing on a national basis.

The objective of the breeding program is to produce structurally sound, functional cattle with the genetic merit to meet the needs of all segments of the beef industry and be in demand by other breeders. Expected progeny differences (EPDs) from National Cattle Evaluations and visual evaluation of economically important traits are used in tandem with pedigree evaluation to select cattle which meet this objective.

The purebred operation is one of the unique experiences which OSU can offer to animal science students and potential recruits. Producing, promoting and merchandising high quality seedstock is a vital part of a program.

Other Beef Programs

Accurate recommendations promote a closer working relationship between the university and state cattle producers. Case in point: the Oklahoma Beef Inc. program, a joint OSU-producer central bull test facility, is the second largest of its type in the nation.

"We feed and performance test more than 1,000 bulls per year representing 11 breeds," says Sally Northcutt, OSU Extension beef cattle breeding specialist and OBI test coordinator. "Eighty percent are Angus."

Northcutt says performance testing provides quality assurance to beef producers. In-depth records are provided that give an indication of each bull's genetic potential as a sire of future progeny.

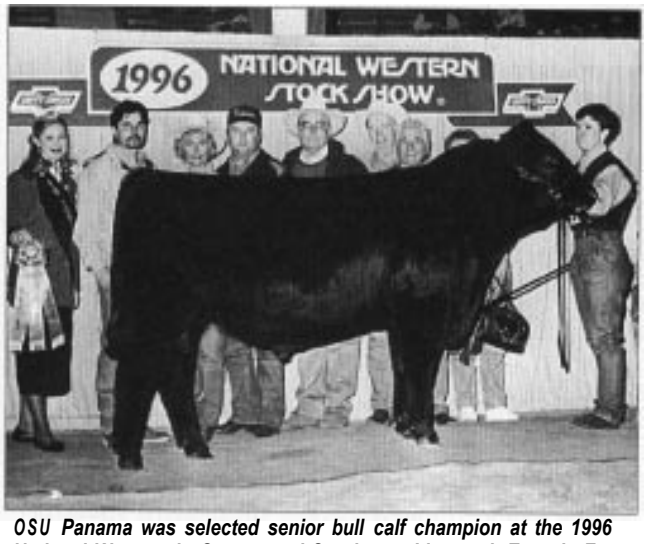
One thing that makes OBI unique is a great number of commercial and purebred producers in Oklahoma and the region are dependent upon OBI to furnish them with quality seedstock, says Northcutt.

"This is an important factor many people overlook— the ability to directly affect what the region's beef herds will become in future years," she says. "OBI targets potential profitability programs toward the needs of cattlemen as a whole."

The OK Steer Feed-Out allows producers to discover how their herds will perform in a feedlot situation without incurring the expense of placing cattle in a commercial feedlot.

Integrated Resource Management programs are conducted on-site, helping producers to tackle operational concerns from a variety of scientific disciplines.

OSU researchers and specialists in cattle breeding, nutrition, management and health put on county-based Extension programs presented in language devoid of "scientific techno-speak," with seminar contents often decided by local producers.



OSU Panama was selected senior bull calf champion at the 1996 National Western in Oenver and Southwest Livestock Expo in Fort Worth.

Annual events such as the Wheatland Stocker Conference at Enid take the university to the public, providing total management concepts to audiences in their home locales.

A gift of 186 Angus cattle by the late Don M. Tyler of Bartlesville even provides the basis for the OSU department of animal science's most prestigious faculty honor. The endowment from the Tyler Award provides roughly $2,000 to be used toward furthering a faculty member's educational, research or Extension activities.

"That somebody thinks enough of the university's efforts to establish such an endowment says something meaningful," says Fred Ray, OSU Extension animal foods specialist and 1993 Tyler Award recipient. "It's not why you do the work, but it makes you feel appreciated."

In the 1980s, Billy Yarbrough, Fairfield, Calif., donated more than $1 million worth of purebred Angus cattle to OSU, including the prized bull, "Hi Guy." This enabled OSU to establish one of the world's most noteworthy black Angus gene pools, now owned by OSU and used for the benefit of the purebred cattle industry.

Buchanan says donations of live cattle or bull semen to OSU have allowed them to develop herds that make possible the types of research that result in accurate, practical recommendations.

"A researcher has to be able to study a producer's herd if research projects looking at ways to improve profitability while meeting industry and consumer demands are to yield practical results," Buchanan says.

Northcutt agrees, saying OSU's reputation is based, in part, on the agricultural industry's perception that state producers have a voice in beef division programs.

"We believe interaction with producers and agribusinesses is necessary; it allows us to identify grassroots programming that helps OSU to direct resources toward the highest priority areas," Northcutt says.

-Donald Stotts
OSU Extension Service

UNIVERSITY OF WISCONSIN

Madison

After a **40** year absence, the rolling pastureland owned by the University of Wisconsin, Madison (UW) is once again dotted by Angus cattle. The University quit raising purebreds from the mid 1950s until 1994.

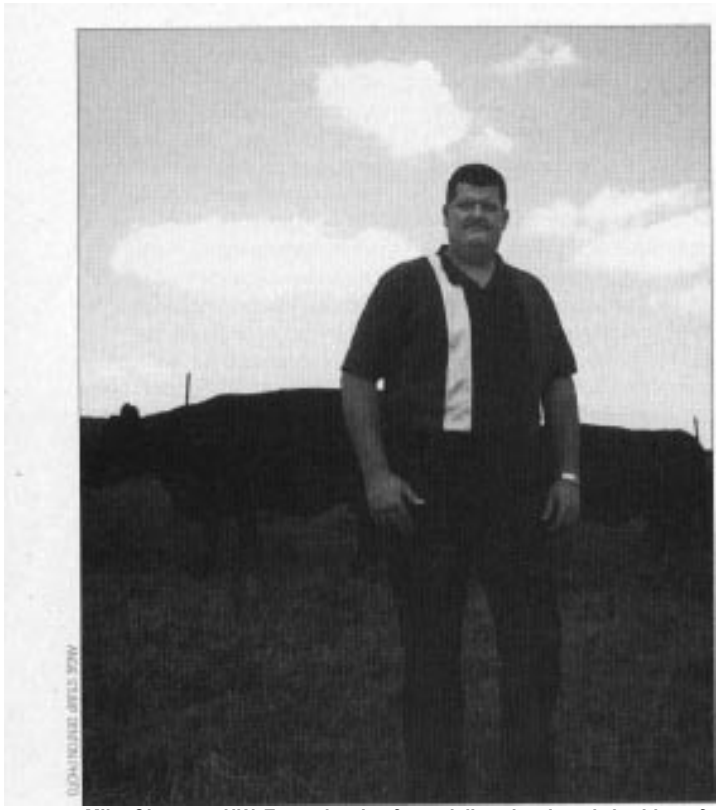
With their Association membership dating back to 1914, the UW herd was prominent in the Angus breed for many years. The University competed successfully in the show ring at state shows and the Chicago International. In the 1950s University administration felt that the show ring had lost its value so they switched to breeding commercial cattle.

When Mike Siemens, Extension beef specialist, joined the UW staff in 1991 he was determined to get the University back into the purebred business. With administration support, he invited all Wisconsin beef breed associations to develop a herd at the University. Answering their request was the Angus and Polled Hereford associations.

Unique from other operations, their source of genetics has been embryos or in-vitro offspring. The genetics of donor cows are donated to the University by Angus breeders.

"We've received tremendous support for what we are doing," Siemens says. "Breeders give us genetics and they'll get genetics back."

The **use of** 45 **donor** cows by 30 different breeders have been made available to UW since 1993. In return for donating genetics, the University shares the flushes equally with the breeder.



Mike Siemens, UW Extension beef specialist, developed the idea of a state sponsored herd for their beef unit near Arlington,

The donor cows are isolated at the Bovine Reproductive Technology Laboratory, Arlington. The donated females stay at the facility for various lengths of time.

The University will use in-vitro fertilization technology on cows that can't normally have offspring. University technicians have been able to retrieve eggs from some high caliber cows that could not have offspring otherwise. In some instances they have surgically removed the cow's ovaries and aspirated the remaining eggs before marketing the animal.

The herd is maintained on 2,000 acres located north of Madison near Arlington. The recipient females and cow herd are kept at the Beef Physiology Unit.

The first two calf crops at the University were all embryo and in-vitro offspring. Fourteen Angus were born in the spring of 1994 and 22 Angus in 1995. The spring of '96 they had 35 Angus calves, including embryos, in-vitros and the calves out of the '94 replacement females.

An advisory committee of three academic personnel and four breeders oversee the herd.

UNIVERSITY OF
WISCONSIN
MADISON

University enrollment: 37,500

College of Agricultural and Life Sciences: 2,200

Department of Meat and Animal Science: 140 students

To help with the management and everyday activities, in June 1995 they hired Brian Bolan as herdsman.

Expected progeny differences (EPDs) are a selection tool used by UW. They are committed to collecting performance data and reporting it to the American Angus Association's Angus Herd Improvement Record (AHIR) department.

"We want cattle with a good set of EPDs," Siemens says.

They select for low birth weight, high growth and solid milk production. Their selection criteria for EPDs has been +2 or less birth weight, 60 or more yearling and double digit milk.

Other important traits are phenotypic soundness and function, fleshing ability and cattle that will survive the harsh Wisconsin winters.

"We're not trying to make them all peas in a pod," Siemens says. "If we've got a niche female we'll try to maintain that niche and propagate it."

Their goal is to build a select herd of 70 mature, good, solid black females.

The UW herd's main functions are for teaching, outreach and applied research. During the school year dozens of University students work on the farm learning management and technical skills. Taking

University cattle to shows and sales gives the herd exposure, helps with recruitment of new students and is an educational tool for students helping at the events. Outreach activities include hosting 4-H and FFA field days on the farm.

In the future they plan on developing a livestock marketing course. In this class students would plan and host a production sale offering university livestock.

After three years the UW beef cattle program is still trying to get its feet on the ground, constantly striving to meet the goals set by Siemens and the advisory board. But as the program grows and develops, the UW herd is building a reputation in the state of Wisconsin as a source of genetic value.

-Angie Stump Denton

HIGH-TECH LAB FOCUSES ON CATTLE REPRODUCTION

The University of Wisconsin has established the Bovine Reproductive Technology Laboratory (BRTL). The objective of this laboratory is to work with producers, in conjunction with university embryo transfer specialists, to create offspring from otherwise infertile cows.

Donor cattle diagnosed as infertile or suboptimal embryo producers can produce valuable embryos and pregnancies by in-vitro fertilization (IVF). Terminally ill or immobile cows can produce pregnancies through IVF.

Donor cattle must be dry to be housed at the Arlington facility and can be transported to the laboratory on the day of the collection. In the case of terminal or immobile donors, the ovaries may be removed and shipped to the laboratory for subsequent embryo production.

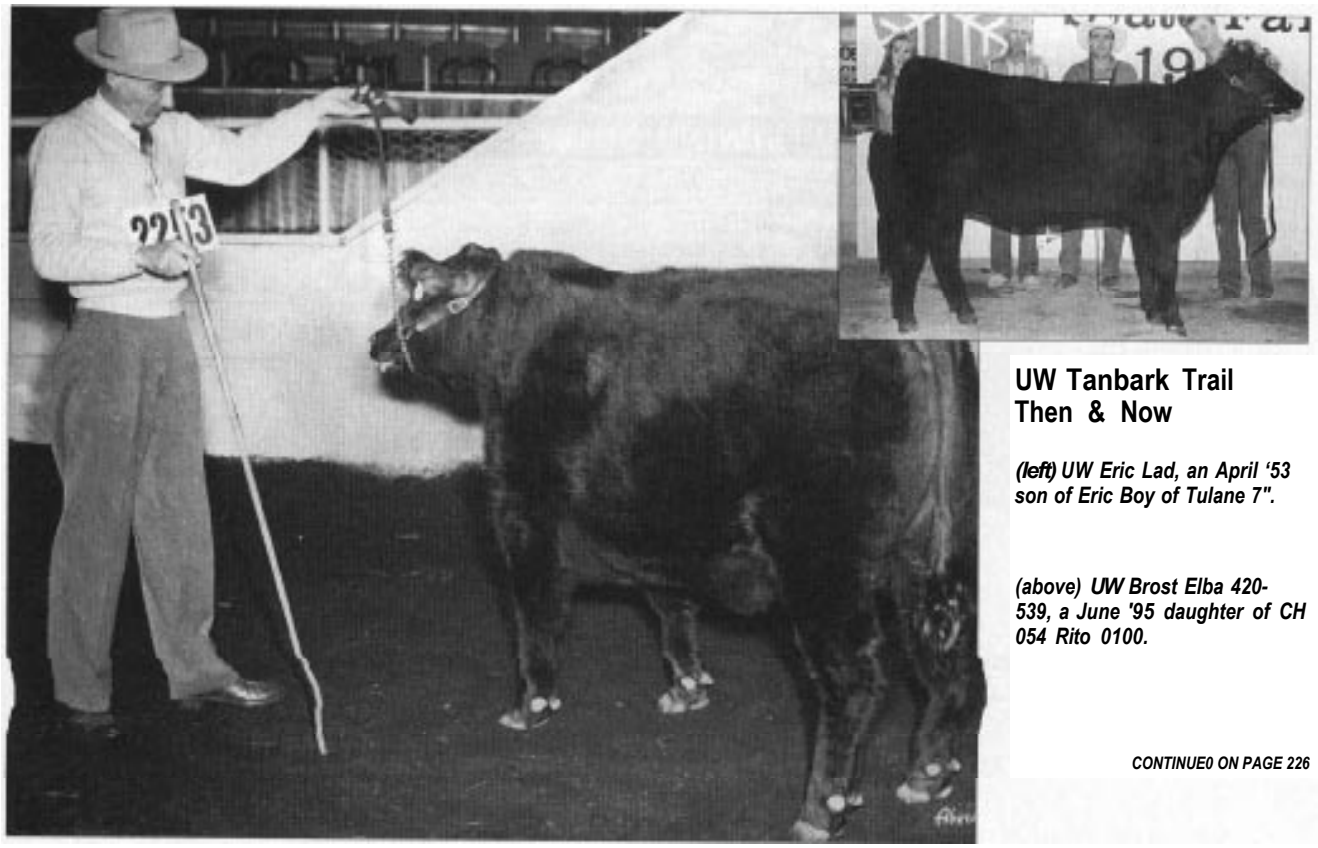
THE PROCEDURE

Ova Collections— Oocyte Collection

Immature ova (eggs) are collected directly from the ovaries using an ultrasound-guided needle passed through the vaginal wall and into a follicle, a fluid filled sac on the ovary that contains the egg. Suction is applied to retrieve the egg along with the fluid. This procedure can be performed once a week without reproductive harm to the donor cow. This drug-free process reduces stress on the donor and expense.

In-vitro fertilization

The collected ova are matured for one day, fertilized with semen of the client's choice, and then cultured in an incubator for about seven days. Appropriate embryos are than transferred into quality recipients. As with conventional embryo transfer, donors are highly variable in embryo production. On average a collection yields eight to 10 immature ova, resulting in one or more transferable embryos and a 50 percent pregnancy rate.



UW Tanbark Trail Then & Now

(left) UW Eric Lad, an April '53 son of Eric Boy of Tulane 7".

(above) UW Brost Elba 420-539, a June '95 daughter of CH 054 Rito 0100.

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UNIVERSITY OF WYOMING

Laramie

The University of Wyoming sets high on the picturesque and windy plains of southern Wyoming. Current student enrollment is at 11,000. A total of 850 students are enrolled in the Agriculture College of this land-grant university, including 125 undergraduate and 16 graduate students with animal science majors.

Because it's the only university in Wyoming, Cowboy pride runs rampant from Cody to Evanston to Cheyenne. Every Wyomingite claims UW for their own even if they've only lived here a few years.

The main purpose of the UW animal science department is research. They also provide comprehensive programs in teaching and Extension Service, covering livestock species that account for approximately 80 percent of the agriculture income in Wyoming.

The animal science department has use of approximately 4,700 acres of University property for its livestock facilities and grazing rangeland. They have another 300 acres of irrigated hay meadows. The rangeland provides forage for a sheep flock as well as winter grazing for the cow herd.

There is enough grazing in the spring to support a 25-day artificial insemination (AI) program before moving the cows to summer pasture on the McGuire Ranch. This ranch is approximately 5,400 acres of native rangeland located 28 miles northeast of Laramie.

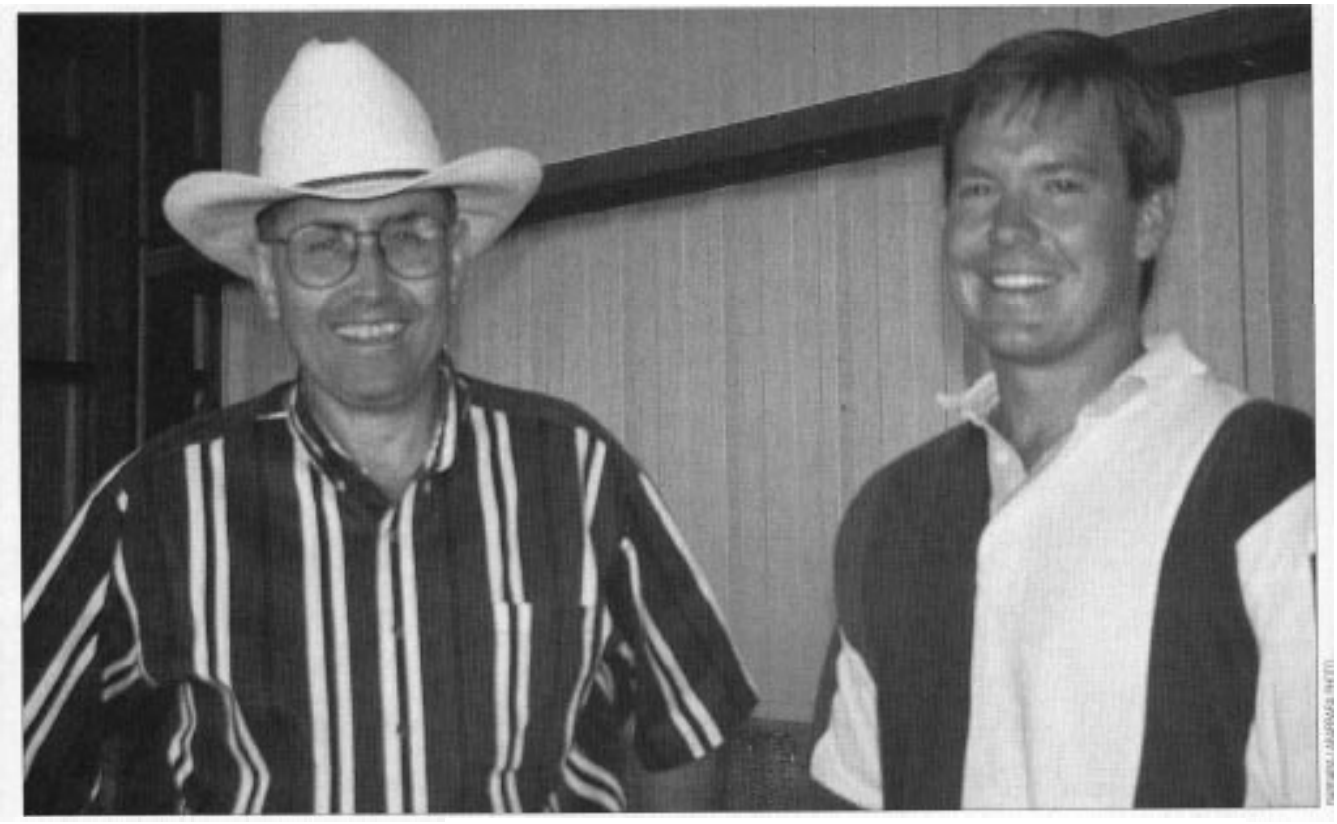
UW manages a beef herd of 200 Angus/Gelbvieh commercial cows. In the beginning they had small lots of several breeds including Angus. The numbers were not enough to compare breeds.

"We felt we were better off to choose a breed combination which would give us a uniform group of cows to use in research projects," says Doug Hixon, professor of animal science and Extension beef cattle specialist. "Because of the flexibility of the Angus cow and the tools we have available, we can make directional changes in our program to fit our environment. Her mothering ability, moderate size and dark pigmented udder are a benefit in Wyoming. We feel the two breeds (Angus and Gelbvieh) complement each other."

With this beef herd UW animal scientists are able to do research benefiting Wyoming breeders, the majority of who manage commercial herds.

The UW breeding program involves a rotational cross. A cow sired by an Angus bull will be bred to a Gelbvieh. If sired by a Gelbvieh, she will be bred to an Angus. The system has been in effect seven years. Gelbvieh have a breed improvement record program similar to Angus and widely use expected progeny differences (EPDs). One exception is Gelbvieh has added an EPD for gestation length that the Angus do not have.

Ranchers donate semen for the University of Wyoming's AI program. It's a two-way street, UW gets high quality semen at no cost. In turn, they give the ranchers carcass information on the calves. UW's AI and synchronization programs are so



University of Wyoming Extension beef specialist Doug Hixon helps lead students such as Joe Thielen to a career in the beef industry.

successful they have not used a clean-up bull in years.

Breeding and reproductive data is kept on heifers from the UW herd and is related to their nutritional programs. The heifers run on grass until fall when they are sold as bred heifers. A few of the top prospects are kept for replacements. Steers are fed out for use in nutrition research projects.

Many of the university's research projects involve wintering cows; for example, winter nutrition, cow body condition and reproduction. Wyoming has limited natural resources. To make it economically feasible, heifer development has to take place with natural nutrition resources.

"We are looking for ways to reduce costs," Hixon says. "We tell students to look at the profitability formula— outputs such as pounds weaned times price. From a genetic standpoint we can do something about pounds weaned. Unfortunately, we cannot control price. The one thing you can control is cost. One of the biggest benefits of our program is students going into the cattle business find out what not to do."

UW has worked with pharmaceutical companies getting FDA clearance for products that would reduce feed costs and a synthetic progesterone product to synchronize heifers for early breeding. Research projects in 1995 included

Meat Technology

1. Growth and carcass characteristics of open, spayed and single-calf heifers.
2. Factors related to tenderness in open, spayed and single-calf heifers.

Cow-Calf Management

1. Effects of growth-promoting implants on suckling calf performance and subsequent reproductive performance of replacement heifers.
2. Efficacy of Lasalocid for improved feed efficiency, maintenance of body weight and/or body condition in mature beef cows.

Other research projects in progress at the University of Wyoming include studies of packaging, fabrication, food microbiology, and testing of cooked meats in regard to tenderness, texture and taste.

"There is a lot of Wyoming pride concerning the University of Wyoming," says Hixon. "We feel accountable to the people we serve -the citizens of Wyoming."

-Barbara LaBarbara

CHANGES IN STORE FOR WYE ANGUS BEEF HERD

Thomas Fretz, dean of the College of Agriculture and Natural Resources at the University Of Maryland, College Park, has announced that major changes will be made to the Wye Angus beef herd beginning Sept. 1. The herd is located at the Wye Research and Education Center (REC) near Queenstown

The beef herd changes are designed to ensure full utilization of the herd for the improvement of Maryland's beef industry. They will be overseen by Scott Barao, associate professor of animal sciences, who will assume programmatic responsibility for the herd.

Changes to occur during the next year include:

■ The size of the base herd will be reduced to a level better matched to the college's available resources. The cow herd will be reconfigured to more closely reflect the unique germplasm base developed by Jim Lingle and gifted to the University by Arthur Houghton.

■ The 1997 Wye Sale will include a larger than usual offering of select Wye-based females. Future sales will occur as needed based on the availability of excess females or superior genetics that will benefit Maryland's cattle industry.

■ An open Maryland Bull Test Station will be established at the Wye REC in 1997. Details concerning the test will be made available this winter.

■ An industry advisory committee will be formed to ensure close communication and collaboration between the Maryland beef cattle industry and the University.

The beef cattle research program conducted at the Wye Research and Education Center will focus on addressing both current and future needs of the industry.

"We have a unique opportunity to pursue important beef research using a forage-based cow-calf production system with a highly defined genetic base," explains Barao. "We will build our efforts around the concept of Integrated Resource Management (IRM), and we anticipate creating a beef research, Extension and teaching program that will be highly productive and responsive to the needs of our citizens."

Eddie Draper, along with Russell Brinsfield, head of the Wye REC, will assist Barao in these efforts by assuming day-to-day responsibility of the Wye herd. Draper has worked with the herd for 10 years and is looking forward to being part of a viable and active research program.