

Muscle or Fat?

Michigan State animal scientist gives tips for how to tell.

BY NANCY GRATHWOHL

Until you hang it on the rail, it's often difficult to tell if an animal's thickness consists of muscle or fat. And when you're picking a yearling herd sire, hanging him on the rail isn't an option.

Expected progeny differences (EPDs) for backfat, if available, can remove some of the guesswork Mark McCully, who teaches live animal evaluation and coaches the livestock judging team at Michigan State University (MSU), offered some tips for estimating muscle and fat on live animals at the National Beef Cattle Symposium held at MSU in December. Visual appraisal, tactile evaluation and new technological advances can aid the search.

Visual appraisal is mastered by understanding muscle shape. "Lean, muscular cattle will have a well-defined, trim, round shape while fat, light-muscled cattle tend to appear smooth, wasty and flat," says McCully.

Differences in muscle shape are identified in the forearm, top, loin, stifle and rear quarter. Fat, on the other hand, is detected in the brisket, ribs, flank and tailhead.

Handling the animal allows for a more tactile evaluation of muscle and fat. Feeling

over the ribs, the flank, down the top and over the loin edge permits the handler to evaluate the amount and uniformity of finish, McCully explains. Handling down the top and over the loin edge also gives a more accurate evaluation of muscle mass.

Once the hide is off, 12th rib fat thickness and ribeye area provide a more precise measurement of fat and muscle. "These two measurements, taken at the 12th-rib interface, have been accepted for some time to be the most highly correlated with retail yield" says McCully.

Seam fat, or intermuscular fat, also has a large effect on retail yield. "The scary thing is, fat makes up about, on average, 40-42 percent of the total fat in a beef carcass and that's the one we have a tough time measuring," says McCully.

Ribeye area, hot carcass weight, adjusted 12th-rib fat thickness and percent kidney, pelvic and heart fat (KPH) are used to calculate yield grade. "The U.S. Yield Grade system predicts the yield of boneless, closely-trimmed retail cuts from the round, loin, rib and chuck," says McCully.

While yield grade predicts retail yield, quality grade is an indicator of eating

quality. It's based on marbling score and maturity of the carcass. "Marbling score is a subjective assessment of amount, texture and distribution of intramuscular fat," McCully adds. "Marbling is based on genetics. The old theory of feeding cattle longer to get cattle fatter and have more marbling is probably not accurate."

Maturity only affects quality grade when the carcass is not classified as "A" maturity. "If the carcass is 'A' maturity, then marbling determines quality grade," says McCully. "However, 'B' maturity carcasses, which are cattle over 30 months of age, can't get into Select or low-Choice. They would be considered Standard."

New technological advances may make measuring fat and muscle easier and more accurate in live cattle. The time and expense of progeny testing to identify animals with superior carcass genetics, he predicts, will be eliminated. These new technologies will also aid in developing carcass EPDs and allow for a more accurate sort of feeder cattle, says McCully.

Two new technologies, which may prove beneficial, are Video Image Analysis (VIA) and Supergene Probe 2000. VIA uses a computer to interpret video camera images and measure differences in muscle shape, says McCully.

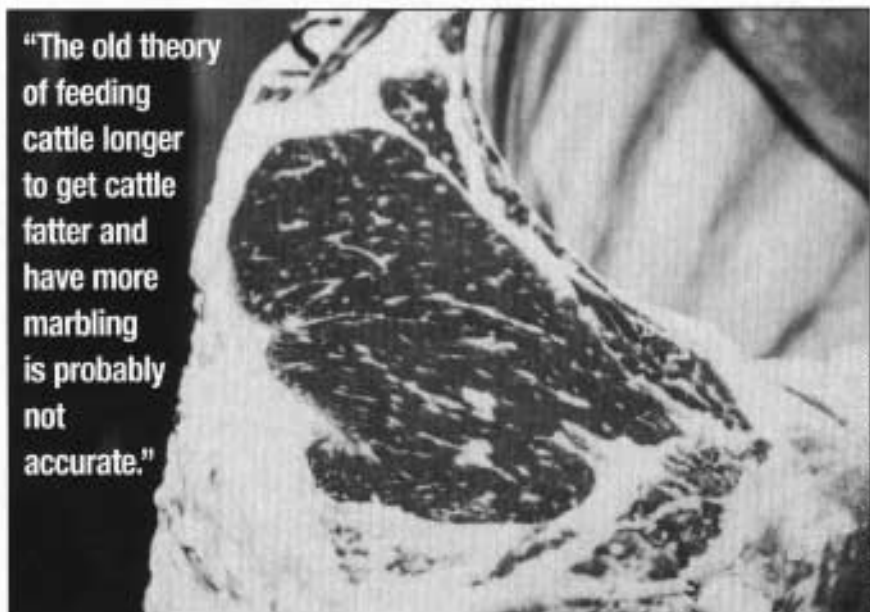
Supergene Probe 2000 is still in the experimental stage. Its goal is to predict tenderness and salable meat yield. "Based on the theory that flat-boned cattle produce more tender meat, the Supergene Probe 2000 measures bone profile of cattle by analyzing the lower jaw," says McCully.

Another technology is ultrasound. It not only measures backfat depth and loin eye area, but intramuscular fat as well.

"Regardless of technology or software, the accuracy and repeatability of ultrasound measurements has been found to be highly dependent upon the technician. Because of this fact, it was inevitable that a certification process be developed," says McCully.

A certification process was developed by the Beef Improvement Federation (BIF) in conjunction with Iowa State University (ISU).

"To become certified, a technician scans a set of market cattle at ISU, interprets the images, and turns in the numbers. When compared to actual carcass data, the ultrasound measurements must be within 0.1 inch for 12th-rib, fat, 1.2 square inches for ribeye area, and 1.2% for intramuscular fat (PIF)," McCully adds. "Many technicians are more accurate than this, but because of measurement error and variations within the packing plant, higher accuracies could not be expected."



CERTIFIED ULTRASOUND TECHNICIANS ANNOUNCED

The Animal Ultrasound Practitioners Association (AUP) announces its list of certified technicians. The AUP-certified ultrasound technician list replaces the old Beef Improvement Federation (BIF) list.

"AUP has taken on some of the certification responsibilities previously conducted by BIF," explains Craig Hays, AUP president. "Guidelines

to evaluate ultrasound proficiency are still mandated by BIF, but the actual certification process is administered by AUP."

The newly formed AUP membership is made up of ultrasound technicians, cattle producers, breed association representatives and university Extension and research personnel.

The following table lists the technicians

certified by AUP; the traits for which they are certified, home state and phone number, the equipment they operate and their certification expiration dates. Technicians can certify in any or all of the ultrasound traits, which include fat thickness (BF), ribeye area (REA), percent intramuscular fat (%IF) and rump fat (RF).

Name	State	Phone	Measurements Certified For	Equipment(a)	Term Expires
Reynold Bergen	Manitoba	(204) 945-7681	BF, REA, %IF, RF	CVI	6/98
Teresa Binetruy	Saskatchewan	(306) 966-4154	BF, REA, %IF, RF	CVI	6/98
Mark Davis	Virginia	(540) 231-8750	BF, REA, %IF	CVI	6/99
Craig Hays	Mississippi	(601) 840-3598	BF, REA, %IF, RF	CVI	10/99
Craig Hays	Mississippi	(601) 840-3598	BF, %IF	CPEC210	6/98
Kari Hoff	South Dakota	(605) 256-3802	BF, REA, %IF	CVI	6/98
Kari Hoff	South Dakota	(605) 256-3802	%IF	CPEC210	6/98
Matt Jones	Texas	(409) 828-3968	BF, REA, %IF	CVI	6/99
Rethel King	Arkansas	(870) 743-3440	BF, REA, %IF, RF	CVI	6/98
Norm Kohle	Saskatchewan	(306) 933-5299	BF, REA, %IF, RF	CVI	6/98
Kathy Kolb	South Dakota	(605) 244-7145	BF, REA, %IF	CVI	6/98
Willard Lemaster	Florida	(352) 392-2390	BF, REA, %IF	CVI	6/99
Jeff Leonard	Georgia	(818) 785-2060	BF, REA, %IF, RF	CVI	10/99
Cindy Nagel	South Dakota	(605) 369-2628	BF, REA	CVI	6/98
Cindy Nagel	South Dakota	(605) 369-2628	%IF	CPEC210	6/98
John Parks	Illinois	(815) 225-7368	BF, REA, %IF	CVI	6/99
Lorna Patton	Texas	(409) 846-9499	BF, REA, %IF, RF	CVI	6/98
Tommy Perkins	Missouri	(417) 836-5638	BF, REA, %IF, RF	CVI	10/99
Trevor Preston	Nebraska	(402) 685-6502	BF, REA, %IF	CVI	6/98
Dean Pringle	Georgia	(706) 542-0997	BF, REA, %IF, RF	CVI	10/99
Clare Robertson	Texas	(409) 396-6139	BF, REA, %IF, RF	CVI	6/99
Mark Thallman	Nebraska	(402) 762-4389	BF, REA, %IF, RF	CVI	6/98
Michael Thompson	Mississippi	(601) 252-5454	BF, REA, %IF	CVI	10/99
Robert Williams	Georgia	(706) 542-0908	BF, REA, %IF, RF	CVI	6/98
John Brethour	Kansas	(913) 625-3425	REA, %IF	CPEC210/500	10/99
Don Bush	Missouri	(417) 256-6145	BF, REA	PIE	6/98
Chandra Campbell	Missouri	(573) 674-4523	BF, %IF	CVI	10/99
Kristi Gordon	Kansas	(785) 282-3893	BF, %IF	CVI	10/99
Doug Kirkpatrick	Oklahoma	(405) 492-4404	BF, %IF	CVI	10/99
Shane Kolb	South Dakota	(605) 244-7145	BF, REA	CVI	6/98
Matthew Lane	Kansas	(785) 462-9826	BF, REA	CPEC210/500	10/99
Matthew Lane	Kansas	(785) 462-9826	BF, REA	CVI	10/99
Jason McLennan	North Dakota	(701) 282-2835	BF, REA	PIE	6/98
Robert Owens	Nebraska	(402) 336-4075	BF, %IF	CPEC500	10/99
Sherry Parks	Mississippi	(601) 526-5255	BF, %IF	CVI	6/99
Bob Patacini	Washington	(509) 882-3398	BF, REA	CPEC210	6/98
Mel Pence	Iowa	(515) 296-2195	BF, %IF, RF	CVI	10/99
David Petsch	Wyoming	(307) 246-3451	BF, %IF	PIE	10/99
Paul Ritter	Kansas	(913) 672-4940	BF, %IF	CPEC210/500	10/99
Kelly Slover	Texas	(806) 383-3687	BF, %IF	CVI	6/99
Michael Stanek	Wisconsin	(414) 473-7607	BF, %IF	CVI	6/99
Gene Stillman	Wyoming	(307) 635-6716	BF, REA	PIE	10/99
Rich Tait	Iowa	(515) 294-5275	BF, %IF	CVI	6/99
Tristan Ermond	South Dakota	(605) 355-9277	BF	CVI	10/99
Gerald Fry	Arkansas	(501) 556-5080	BF	PIE	10/99
Tim Gardner	Kentucky	(502) 843-9007	BF	CVI	10/99
Lance Jefcoat	Mississippi	(601) 729-8824	BF	CVI	6/99
Jan McNichols	Nebraska	(402) 336-4075	REA	CPEC500	10/99
John Meadow	Alabama	(205) 345-5936	%IF	CVI	6/99
Scott Nash	Idaho	(208) 236-7312	BF	PIE	6/99
Tracy Petsch	Wyoming	(307) 246-3473	BF	PIE	10/99
Wendy Petsch	Wyoming	(307) 246-3512	BF	PIE	10/99
Alvin Ruiz	Wyoming	(307) 532-3889	%IF	PIE	6/99
David Snyder	Texas	(254) 968-9222	%IF	CVI	10/99
Griff Tomlin	Kentucky	(502) 843-9007	BF	CVI	6/99
Larry Varnadoe	Georgia	(912) 386-3858	BF	CVI	10/99
Rod Wendorff	Alberta	(403) 752-4066	BF	CPEC500	10/99
Billy Whitfield	Kansas	(316) 384-7711	%IF	CPEC210	10/99

(a) CVI—Critical Visions Inc.; CPEC—Cattle Performance Enhancement Company; PIE—Classic Ultrasound System

