



PHOTO BY BEN LOYNING, LOYNING ANGUS

Believing in **BONSMAS**

Elite cattle operations are using half-a-century-old phenotypic characteristics to improve cattle.

by Sara Gugelmeyer

Gene Meitler had studied Jan Bonsma’s principles of cattle selection since his childhood, and had spent decades in the cattle business trying to raise the perfect cow. In March 2020, longtime friend and mentee of his, Brent Lonker, gave him a call. Neither realized Meitler didn’t have long to live.

“I was building a new herd for myself,” says Lonker, a fifth-generation cattleman originally from the Gypsum Hills near Medicine Lodge, Kan. “I wanted to make sure I was still on point in my ability to evaluate cattle using Bonsma principles.”

Lonker reached out to Meitler, of Meitler Cattle Company, Lucas, Kan., whom he’d known since childhood. Meitler had been instrumental in teaching Lonker and his family about Bonsma.

“That started about a nine-month period of us talking off and on, as I was honing my cattle selection skills again,” Lonker says.

During these conversations, Lonker mentioned he thought Meitler should think about preserving his knowledge of the principles as the Bonsma books are becoming hard to get. They discussed maybe videoing some cattle or taking some pictures and getting Meitler’s opinions

recorded. Nothing was set in stone until one day, Meitler said to Lonker, “If you’re going to come, you better come now.”

Something about that phone call created an eerie urgency in Lonker, and he hung up the phone with Meitler and booked his plane ticket back to Kansas.

“I bought a good video camera and headed to his place. I spent a day and a half with him, videoing cattle and his descriptions of them. My goal was to make a video to share on his application of Bonsma principles.”

Five days later, on Oct. 2, 2020, Meitler passed away due to complications from COVID-19.

“His last trip to the pasture was with me,” Lonker says. “After I left he went to the emergency room. I filmed the last time he was with his cows. And it was an honor to be there and film him. I knew right away that God laid this at my feet to keep his knowledge going. That’s the story. These principles are real, accurate, meaningful, worthy.”



Who is Jan Bonsma?

Jan Bonsma was born in 1909 in South Africa. He earned a bachelor’s degree in animal science from the University of Pretoria (South Africa) in 1931 and his teacher’s certification the next year. He started teaching, then earned his master’s degree in animal science in 1936 and did postgraduate work at Iowa State University (ISU) with world-renowned animal geneticist Jay Lush.

In 1937 he returned to South Africa, and would lead a massive research program at the South Africa Department of Agriculture’s Mara Research Station in Limpopo for 23 years.

Bonsma’s mission was clear: to help solve South Africa’s cattle industry problem. The native cattle breed, Africkander, needed improvement to reach the commercial production of other breeds. European cattle were imported to the area, but they could not survive in the harsh environment.



After decades of research and experimentation, Bonsma and his team developed a new breed, the Bonsmara, of approximately 3/16 Hereford, 3/16 Shorthorn and 5/8 Africkander. Bonsmara cattle was made an official breed in 1970.

Throughout his career, Bonsma, who later was given an honorary doctorate; authored more than 200 works, including seven books; and spoke around the world on his knowledge of beef cattle. His list of accolades is long, with many from American universities and cattle breed associations because of his extensive work in improving breeds.

He traveled around the world speaking on his findings, often at universities. In fact, in 1975, Texas A&M University awarded him the “Distinguished Guest Professor.” He was the first foreigner to earn the honor.

This praise accompanied the award: “Never before has one man given so much to so many in the practice of beef improvement. Your educated but pragmatic approach to teaching your fellow man how to improve his efficiency of beef production will indeed leave its mark on the livestock industry for generations to come.”



Inspiring the next generation

It was during this time, about 1965, that 16-year-old Meitler traveled to Kansas State University (K-State) with his father and some neighboring ranchers to listen to Bonsma present his principles.

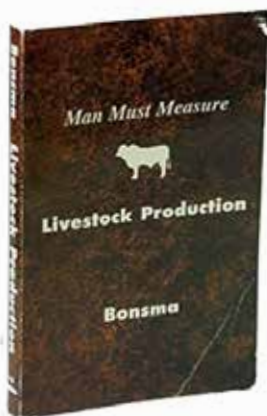
“That was dad’s first introduction to Bonsma’s teachings,” explains Meitler’s youngest son, Darris, who, along with his brother, Clint, operates Meitler Cattle now. “That was just the beginning, and it really struck a chord with my dad. That was the start of his lifelong fascination with Bonsma principles.”

What are these principles? These traits Bonsma discovered while selecting to improve native cattle in South Africa seem simple, but they can mean the difference between profitable cattle herds and those that can’t pay the bills.



Signature look

The first and foremost thing Bonsma believers preach on is the fertile cow’s signature look. Darris explains the physical Bonsma characteristics he looks



for, proven through his father’s 50-plus years in the cattle business.

“Cows should have a good ewe neck, which is a thin, feminine neck in front of a high shoulder rotation. She should be real feminine throughout, with a perfect udder. She should have plenty of slope in hooks to pins to allow for good calving ease and good capacity that are fit to their environment and thrive in their environment,” Darris says.

These may seem like obvious characteristics, but the proof is in the pudding. Females look this way because of estrogen.

The most important part of Bonsma’s phenotypic evaluation is that cow or bull shape is directly related to hormonal changes during the onset of puberty. Most fertile cows and bulls will have the most robust puberty early in life, which results in these distinctive physical characteristics.

Gene explained in more detail during his 2018 presentation, recorded during the field day “Cattle Production Lessons in Function Follows Form.” He quoted Jan Bonsma’s *Wortham Lectures in Animal Science* book.

“The ossification of the epiphysis, which is commonly referred to as the closing of the growth plate, depends on the secretion of estrogen in the cow and testosterone in the bull,” he said. “The time of ossification depends on the hormone balance. The secretion of estrogen in the female and the testosterone in the male causes the bone to ossify, and the overall growth of the animal is stopped because the bone growth has discontinued.”

This concept of estrogen in a heifer stopping the long bone growth is one that is treated with the most irreverence among Bonsma believers. It creates a signature wedge shape in the cow with the front end being smaller and more feminine, and her back end deeper and longer in her hip. It also creates a high shoulder rotation in the female, where the scapula blades on the shoulder rotate above the spinal processes as the animal walks.

Darris explains, “I describe it to people as similar to a big cat, like a mountain lion, that is sneaking up on its prey and its shoulders are really sticking up above the spine. It’s really an athletic movement. Cows with that high shoulder rotation and feminine neck will even have somewhat of a ewe neck in front of the shoulder that will dip down as it goes into her head and neck.”

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Darris adds this singular trait is very predictive of fertility.

“Those are the most fertile cows that will rebreed every year and lasts into her teens and rebreed at the beginning of the breeding season,” he says.

This difference in hormones between male and female is not exclusive to cattle, Darris points out.

“Estrogen causes a female to look like a female, and testosterone causes the male to look like a male,” Darris says.



Wedge shape

Ben Andrews has been the manager of Spring Valley Ranch, Bassett, Neb., for the last 12 years. Since he started there, he’s been evaluating bulls and cows for fertility almost exclusively based on this concept of wedge shape.

“When I first came here, we purchased some cattle from a gentleman, Sam Wylie, from Pennsylvania. He came out to our place and evaluated our cows based on Bonsma principles and showed me what to look for,” Andrews says. “We were drinking coffee, and he asked me to pick out my oldest cow. I pointed to her, and he turned his coffee cup sideways and showed me how the cow’s shape matched my tapered coffee cup. So then he asked which was my best, oldest bull. I pointed the one out to him, and he flipped the coffee cup around, and it matched that shape.

“Then I started to notice and understand that if you have a cow that’s wedge-shaped like that coffee cup one way and a bull who is shaped the opposite, you breed them together, you get a result that can be highly repeated.”

Andrews explains that for the last 12 years, he literally compares each cow to a coffee cup. He looks for those who are smaller in the front and wider in the back, with high-rotating shoulder blades and slope to their hip.

Sorting bulls requires the opposite shape. More testosterone produced creates a large, strong front end and smaller, shorter hind end.

Lonker describes it well.

“A highly fertile bull will never stop laying muscle on his front end his whole life, because of testosterone production. He will look buffalo-fronted because that muscle continues to get laid on. They have a distinctive look. A neck crest is a big sign of testosterone production,” Lonker says. “When they have full-blown puberty, you can look at the neck crest and that will tell you everything you need to know about how much

testosterone they are making. The same is true for a female. If a heifer or cow has a cresty neck, that’s a sign of too much testosterone, not enough estrogen; she will be subfertile.”

As the evaluation moves from the front to the back, Bonsma focused on having plenty of slope from hooks to pins on females. Rearward sloping rib bones, especially after the female’s first lactation, is a sign of a highly fertile cow because of more estrogen production. The sloping hip creates more pelvic area.

Meitler described this in his presentation, “Highly productive cows must have slope from hooks to pins. That makes the pelvis of the animal stand up straight in the animal. That’s why elk, deer, goats have that slope, because nature created that with survival of the fittest.”

He compares it to a basketball fitting through a basketball goal.

“There can be the same amount of measurable opening in the pelvis, but if one is tilted up, usable space is lost. Kind of like taking a basketball goal and putting it up against the backboard, it’s a lot harder to get the ball through the goal when it’s too close to the backboard,” he said. “It’s a lot harder to get the calf through a pelvis that’s tilted upward with the backbone being the force above. You lose all that space even though you measured the pelvis and the measurement was OK. She’s so flat in her rump she can’t use all that you measured to deliver a calf.”



Hair shedding

One of the greatest predictors of hormonal superiority is hair shedding.



“The first cows to slick off will be the first ones to breed,” Meitler described in his presentation. “Cows that don’t slick off until well into hot weather will come up open.”

That’s because of their hormones.

“The really basic Bonsma principle that I always start with is hair shedding,” Lonker explains. “The same hormonal change that makes her come out of anestrus and rebreed is the exact hormonal combination that makes her shed hair. So if you look at your own cow herd, your most fertile cows will always be the early hair-shedders. It’s a direct mirror of what’s going on with them hormonally.”

At Spring Valley Ranch, Andrews notices the correlation with hair shedding and fertility.

“They have to shed off,” he says. “Usually if they don’t shed off well, they haven’t gotten bred either; so they don’t get to stay here.”

Hair Shedding Research EPD

The American Angus Association launched a research expected progeny difference (EPD) for hair shedding Feb. 5, 2020. The research EPD has been in development since 2011, and is now brought to fruition through the collaboration of the American Angus Association, Angus Genetics Inc. (AGI), Mississippi State University (MSU), North Carolina State University (NCSU) and the University of Missouri (MU).

Early summer shedding is an indicator for both heat tolerance and tolerance to fescue toxicosis, and it lends discussion to a genetic correlation between a dam’s shedding score and the weaning weights of a calf.

Hair shedding is evaluated on a 1-5 visual appraisal scale, where 5 is a full winter coat, and 1 is completely slick. While there is some variability in shedding patterns between individuals, cattle tend to shed from front to back and top to bottom. Using Angus data, hair shedding has been found to have a moderate heritability of 0.42, falling between that of weaning weight and marbling.

Through the two different projects, 14,465 scores from 8,642 individual cattle have been collected. Breeders are encouraged to submit more data to increase the accuracy of predictability of the EPD.

Hair shedding scores should be collected between mid-April and mid-June. Since regional climates exist, it is important to take those measurements when the amount of hair shed varies the most.

It is important to note, age has a significant effect on hair shedding. For that reason, cattle must be at least a year of age before hair shedding scores are collected.

Visit [Angus.org](https://www.angus.org) for more information about the new research EPD.

This correlation, in part, is why the American Angus Association has developed a hair shedding expected progeny difference (EPD). Read more in the “Hair Shedding Research EPD” sidebar.



Other traits to note

There are a few other smaller indicators of fertility, Bonsma points out. Highly fertile cows will have a brisket pleat, or a noticeable line down each side of her brisket. A large milk vein is another sign of a good cow by Bonsma standards.

“About 200 gallons of blood must go through the system to produce one gallon of milk, so that cow has to pump a tremendous amount of blood through the milk vein,” Meitler explained in his presentation. “Fertile cows will have a long switch and a narrow tail. Fertile bulls will also have a narrow tail and long hair on their penis sheath.”



Why is this important?

One might wonder, after decades of breed improvement through careful selection using EPDs and carefully calibrated indexes, why would we want to return to using research from the 1960s or before? The more information, the better, Lonker says.

“I use all of the information available,” Lonker explains. “I want my cattle to check as many boxes as possible. The combination of Bonsma selection principles and EPDs actually goes hand in hand, for me at least. EPDs tell me a great deal about long-bone growth, fertility, fleshing ability and many other things. Likewise, the actual morphology of the animal standing in front of me also ‘tells a story,’ as Bonsma liked to say. I can then make culling decisions to eliminate, at a young age, a female who has a high probability of coming up open as a 2- or 3-year-old.”

For Spring Valley Ranch, the difference since using Bonsma methods of selection has been remarkable. When owner Frank Taylor hired Andrews 12 years ago, the plan was simple — improve profitability with a forage-based Angus herd.

“When I first came here, we had trouble getting heifers bred and trouble getting bulls to last,” Andrews explains.

Taylor had been studying EPDs and decided to go through the pedigrees of old cows on the place that had longevity. He quickly found some common lines. Then the pair went on a nationwide search for cattle out of those foundation genetics.

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“We found old lines of cows that had contributed a lot to the breed, and then we started stacking them with old bulls we knew the data on,” Andrew says. “We knew they, too, had made this big genetic contribution and we have all these data saying that this works. We thought that making a base to our herd out of them made more sense than anything else.”

Then, for the last decade, Taylor and Andrews have culled relentlessly and used Bonsma principles to select for lines that are functionally efficient.

“We use the KISS method — keep it simple, stupid,” Andrews says with a chuckle. “We sort cattle by coffee cup shape, and we always start with old cows and work our way down to the young cows.”

Chadron State College Agriculture and Rangeland Management professor Ron Bolze was a big mentor to Andrews during the herd rebuilding phase of the operation. Andrews says Bolze reminded him the most important consideration was form following function and function following form.

“If they have the right function, which is being fertile, lasting a long time and raising good calves, then their form followed their function,” Andrews says. “Our goal is to produce cattle for the commercial rancher. Have

you ever heard a commercial rancher say they culled a cow because she was too low on this EPD or too high on that EPD? No. They cull cows for these reasons: lame, open or raises a crappy calf. That’s why our goal is to produce long-lived, fertile cows that pay the bills.”

Darris agrees the key to profitability in the commercial cow-calf business is old cows.

“We want to produce a cow that lasts into her teens, raises a top-end calf every year and rebreeds at the beginning of the breeding season,” Darris says. “In the whole industry, that’s what makes people money. Replacement heifers sure get expensive if you’re having to replace cows over and over again.”

Lonker echoes the sentiment, and while some may argue this is a subjective evaluation, Lonker emphasizes the results are very objective.

“Ranchers who have used this method for decades are getting around a 95% calf crop on a per-cow-exposed basis. The number of heifers required to be retained annually to keep cow numbers constant, per 100 cows, is only about six head. Fertility and longevity has an immediate effect on a ranch’s profitability,” he says. “When I got my degree at K-State, we were taught that fertility is five times more important than growth and 10 times more important than carcass traits, in terms of profit. We may have forgotten that as an industry. Especially when you consider that more than 90% of commercial bull buyers don’t retain ownership.”

Longevity is just as important to bull buyers. Each additional year a bull is able to perform equates to huge savings for the commercial cattleman. Andrews explains they might do things a little different than some, but they promote bulls out of old cows.

“Every bull we keep on this place is out of a cow that is 10 years or older. Why? Because if they are still here at 10 years old, their form followed function and function followed form,” he explains. “Many people say you should keep cattle out of your young stock. It’s new, it’s the best, but I say, ‘How do you know?’ If the bull is out of a 12-year-old cow, I know she has paid the bills, she’s rebred every year, I know she can do it. A young cow may raise a great bull once, but can she do it 12 times? When

Inventory-based reporting key to improving breed

Bonsma recognized a cow’s longevity was one of, if not the most important economical trait, to the commercial cattleman. Angus Genetics Inc. (AGI) wants to provide Angus producers with more ways to prove a sire or dam’s ability to produce cows with longevity. However, more data is needed to develop a longevity expected progeny difference (EPD).

“In order to generate an EPD that will allow for selection for longevity across the entire Angus population, we need data,” says former AGI president, Joel Cowley. “Currently, if a herd isn’t enrolled in inventory-based reporting and a calf isn’t reported for a particular cow in any given year, we don’t know why. Was her calf simply not good enough to register? Was she sold to a commercial producer? Was she culled? If so, for what reason? She may have a calf registered several years later, or we may never receive any more data on her again.”

That’s why inventory reporting through the American Angus Association is so important. With that program, data is provided on all females over 12 months of age, rather than the individual reporting option which only requires data on certain calves, chosen by the producer. Inventory reporting is fairly simple and generates reports on the whole herd to provide data to AGI to aid in the development of EPDs like longevity.

“In order to create an across-herd selection tool for longevity, we need to know how long each cow is staying within each herd and the reason she leaves the herd,” Cowley says.

For more on inventory reporting vs. individual reporting, log on to www.Angus.org/performance.

I sell a bull to somebody out of a 12-year-old cow, I can look him in the eye and say that bull is going to last. I know, because his dam is 12, his sire is 10.”



Data is still important

All this talk of phenotypic evaluation doesn't mean data isn't important. While Andrews says he doesn't use a lot of EPDs in his selection, Spring Valley Ranch still collects birth, weaning and yearling weights; teat and udder scores; and uses a unique scoring system to evaluate bulls.

He has also been very impressed with carcass data he's received on their genetics. The confidence has encouraged him to start a structured sire evaluation at Spring Valley Ranch to compare modern popular Angus lines to the foundation genetics they've been propagating for the last 12 years. The first set of calves out of this evaluation sells in 2021, and the third batch is calving. The plan is to continue to use the evaluation for the next few years to compare genetics of Spring Valley Ranch to more modern genetics to be sure everything is stacking up well.

Andrews does point out that reviving some foundation genetics hasn't harmed their carcass results. Between two commercial customers who fed out their steers last year, 225 head averaged 830-pound (lb.) carcasses, dressed at 63% with more than 90% Choice.

At Meitler Cattle, they've been using these principles for Clint and Darris's entire lives.

“Dad always liked to pride himself that he went to the beat of a different drum and didn't chase the fads as much as everybody else. We are in our 40s now, and when we were young, we thought we knew better,” Darris jokes. “But we quickly came around to know maybe the old men weren't crazy after all. We've held to our guns and made somewhat of a niche deal.”

Darris says most of their new customers want to moderate cow size by purchasing females or bulls to retain females out of.

“Chasing extremes catches up to you in the end,” Darris explains. “Everybody wants giant weaning weights and all that growth, but if you are breeding that into the maternal side over time, it doesn't work. Everyone around here in the '80s used Simmental bulls and kept those cows. Over time their cows got to be 1,700 pounds, didn't get bred, the calves didn't get up; and all of a sudden, they didn't have what they wanted. Don't get me wrong, there's a place for a terminal cross, but the cows have to be bred to be maternal.”



Leaving a legacy


The renewed interest in learning Bonsma principles is exciting for Lonker, who says he feels it's his purpose to be a teacher of Bonsma.

“My goal is to share Bonsma evaluation principles as taught to me by breeders like Gene,” Lonker says. “The ‘eye of the master’ is the art form of cattle breeding, and it will always be with us.”

Lonker created a Facebook group in September 2020, called “Bonsma All-Breeds Cattle Group.” The group already has 1,900 members and counting from all over the world. He posts the videos from his trip to Meitler's operation before he passed, as well as other experts in the field. Members of the group can post their own pictures and ask for advice.

When Lonker posted a video of Meitler's 2018 presentation on Bonsma principles during his visit last year, he wasn't sure of the response it would get. A couple days after he left, he called Meitler, who at that point was very sick and in the hospital, to let him know the video already had more than 2,800 views. That number has grown exponentially since and now has more than 20,000 views.

About six hours after that conversation, Meitler passed away.

“It was an honor for me to be with him during his last trip through his cows,” Lonker says. “I am so thankful to have had that experience so I can share it with others. And I am grateful that I was able to let Gene know the video had been well-received. I could tell he wanted to make sure this information was preserved, and I feel like I was chosen to help with that.” 

Editor's note: Sara Gugelmeyer is a freelance writer from Lakin, Kan.

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on Bonsma breeding
principles or visit [www.
angus.to/bonsma](http://www.angus.to/bonsma).

