

Cloning Offers Unique Breeding Options

Cloning technology has the potential to positively change and improve the cattle breeding industry. A vast array of application makes it versatile and advantageous to breeders as a vehicle to advance elite genetics. Research to improve efficiencies continues, further adding to the promise for more effective use of this technology in the future. Cloning can be a successful means of improving the quality of cattle when implemented as part of a complete, strategic breeding program.

Many opportunities

David Faber, breeder and owner of Faber Show Cattle in Sioux Center, Iowa, has found cloning to be an effective breeding tool. "Cloning allows for increased selection opportunities in my program and provides a means to extend the genetic impact of superior animals."

"I've used cloning to produce a bull that had characteristics I was striving for," says Faber. "I was interested in producing a bull with excellent conformation and carcass characteristics that also was free from known genetic defects. Cloning allowed me to collect an ear punch from a champion steer that possessed these traits, and to use that to make a breeding bull with the same genetic endowment."

Another great example for cloning would be to make genetic copies of cows or bulls to extend the influence within the herd. Additional uses of cloning include multiplying unique animals that produce better carcass traits, such as improved marbling, yield, tenderness, and consistency.

AI, ET, and IVF each have their own application to cattle breeders; but cloning offers unique benefits. "We often spend a lifetime attempting to produce an animal with characteristics we consider superior," Faber says. "With cloning, we have the advantage of knowing exactly what they will produce. In one year, cloning makes genetic copies of the sex, color, and genotype of the original animal."

Faber continues, "In my opinion, cloning is best used to make genetic copies of proven breeding cows and bulls that have demonstrated the ability to produce progeny with significant value."

Cloning also enables us to preserve genetic lines. "It is the ultimate insurance policy for valuable genetic lines," Faber believes.

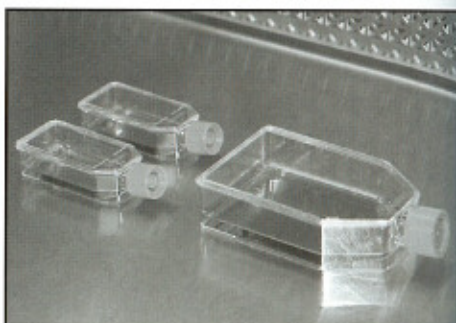
Sometimes the same is different

A cloned animal is a genetic duplicate of the original. However, breeders must realize that identical genotype doesn't always result in identical phenotype.

An important fact to keep in mind is that the genetic potential of an animal created through cloning is the same as the original, while variation can result from non-genetic influences. Environmental factors including care, illness, or even injury will influence the appearance of the animal – both prenatal and after birth. Yet, the fact remains, offspring born through cloning will possess the same genetic predisposition to pass along to offspring, thus they can offer the same superior genetic influence as the original – only with more options to advance the genetics.

From a learning perspective, cloning presents unique

Cells from a simple ear punch of the original animal are isolated and cultured to grow a new cell line and start the cloning process.



Cloning can produce the elite genetics breeders want to propagate.



management opportunities as well. Because they're genetically identical, these animals allow us a unique ability to look at management and environmental impact. This can provide a means to evaluate research such as disease resistance.

Meat (and milk) is safe

Beyond the application of cloning in cattle breeding programs, the Food and Drug Administration (FDA) will make its own rulings on cloning. According to the FDA's extensive risk assessment, products from animals produced through cloning, and their offspring, are as safe as products produced from animals created through natural mating or other reproductive technologies. To help settle consumer concerns, there remains a voluntary moratorium requested by the FDA which encourages the voluntary withholding of meat and milk produced from animals made through cloning, and their offspring, from entering the food chain.

Following a review of the public comments shared earlier this year, the FDA will present its official position and industry guidance in relation to the technology. That position is expected to be a confirmation of their earlier findings.

Advanced reproductive technologies have been one of the most exciting, evolving series of improvements for cattle breeders. Over the past several decades, improvements in heat detection, artificial insemination (AI), embryo transfer (ET), in vitro fertilization (IVF), and genetic testing have contributed significantly to the resources smart, progressive breeders have available. Whether the goal is to improve productivity of breeding stock that perform well on pasture, in the feedlot, or in the show ring, these reproductive enhancements have helped improve genetics at an increasingly rapid pace. And now cloning provides the newest means to both select and extend the impact of elite animals and their genetics.