

Grown or Cloned?

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Abstract

Agricultural technology has made profound advances toward the research of cloning cattle for the purpose of increasing beef quality. This manuscript explores the procedures, history, benefits as well as recognizing other viewpoints involved with cloning animals, and more specifically cattle. Scientific data and explanation from the FDA's Center of Veterinary Medicine (2018) outlines the fundamentals involved with livestock cloning, while answering the question whether it is safe to eat meat from cloned livestock. The Roslin Institute (n.d.) provides a historical background on the first livestock clone, Dolly the Sheep, and to mark the beginning of this type of animal research. Now, modern day investigation is looking to cloning as an option to have a purpose of providing quality beef for consumers, with West Texas A&M University leading the way (Mortenson, 2016). Dr. Ty Lawrence of West Texas A&M University is a popular reference on this groundbreaking technology goal of a Prime High Yielding beef animal and the statistics of these occurring in nature (Mortenson, 2016). While focusing on the procedure, rationale, and positive impact for the consumer, concerns about eating this type of meat are also addressed as well as issues with the process supported by Hood and Mollard's (2016) "The Dolly Legacy: Are You Eating Cloned Meat?" and Mortenson's (2016) "To Clone, or Not to Clone". While much has been discovered on this topic, "Grown or Cloned?" serves as an introduction to this agricultural technology presently at work and to advocate for providing the quality product today's consumer seeks.

Keywords: Cloning, genetics, yield, beef quality

Grown or Cloned?

Picture the most mouthwatering, juiciest ribeye you have ever devoured. When you cut into it with nearly zero effort and consume it with almost no need to chew, allowing you to enjoy the most important part - the quality of its flavor. Now visualize the perfect, most ideal, livestock show prospect you have ever seen (Center for Veterinary Medicine [CVM], 2018). Impeccable structure, superior muscling ability, and to top it all off, has a priceless show ring look (CVM, 2018). Or maybe envision the most obedient dog you have ever interacted with (CVM, 2018). This dog doesn't shed, jump on your guest, make you sneeze, or chew up your good shoes, but instead listens and reacts to every command flawlessly (CVM, 2018). Wouldn't you do anything to sink your teeth into that steak, show that prized animal, or only have to say "here boy" to that compliant cow dog again? There is a way, and cloning is undoubtedly the best way to experience these moments and sights once more. Whether we are talking about cloning livestock or lap dogs, today I will defend that cloning is the future of agriculture. As we bite into this topic, I hope you find it as tasty and easy to swallow as that favorite ribeye.

According to the FDA, "Cloning is a complex process that lets one exactly copy the genetic, or inherited, traits of an animal" (CVM, 2018, What is cloning, really? section, para. 1). Specifically, in animal science, the agricultural technology of cloning is becoming the solution to more than just one problem. When traditional mating becomes ineffective or when farmers need more control over an offspring's inherited traits, cloning is quickly becoming the answer (CVM, 2018).

To simplify the process, cloning is merely removing a mature cell from the animal you wish to clone, then transferring that cell plus the DNA of the donor animal into an egg that has had its own nucleus removed (Trans Ova Genetics, 2020). Place this new cell into the donor animal and the result is an organism we refer to as a clone (Trans Ova Genetics, 2020).

Although we might not all remember what we would consider our firsts, like walking or talking, the legacy of the first clone will be remembered forever. In “1996”, Dolly the Sheep was crowned as the first ever cloned mammal (Hood & Mollard, 2016). The Roslin Institute (n.d.), who carried out this groundbreaking project, believed Dolly's “birth proved that specialized cells could be used to create an exact copy of the animal they came from” (Why was Dolly so important? section, para. 1). Since then, we’ve now cloned more than twenty species in the same way, thanks to Dolly (Greshko, 2018). This four-legged legend was a key factor to unlock pathways to not only keep but raise the quality in the things we enjoy about agriculture (The Roslin Institute, n.d.).

There are many intentions behind cloning, but let's first dive in from a livestock perspective. As a livestock enthusiast myself, I can understand the importance of great genes and not just the kind you wear. For the ranchers of the world, picture the perfect bull (CVM, 2018). Year after year he has bred all your cows and produced easy feeding, low birth weight calves (CVM, 2018). Your problem is, however, he is getting old, and you need another bull just like him to keep your operation going at its peak (Drovers, 2011). The answer is to clone him so his genes can live on (Drovers, 2011).

The livestock industry as a whole strives for perfection in every species in and out of the show ring. West Texas A&M University, for example, has been a leader in cloning cattle (Mortenson, 2016). Journalist, Eric Mortenson wrote of WTAMU research in 2016, stating their mission is to “clone a herd of superior cattle by working backwards from superior beef” (para. 4). Their focus is not to make the ideal show project but instead improve the meat section at your local grocery store (Mortenson, 2016).

Ideally, every carcass would read Prime and Yield Grade One, which are the highest USDA grades a beef carcass can receive in quality and quantity (Mortenson, 2016). The USDA says prime is by far the superior grade and the most desirable because of its

tenderness and flavor (Meadows, 2019). Without the proper muscle to fat ratio your steak could be dry and flavorless (Meadows, 2019). In today's market only "2-5%" of U.S. beef is graded this way, says the USDA (Mortenson, 2016). And out of the beef carcasses on the rail, "only one in every 3,300" will be graded at this high standard, claims WTAMU (Mortenson, 2016, para. 2). With this issue at hand, and the need for more mouth-watering steaks, Ty Lawrence, WTAMU agricultural sciences professor, began the process of cloning with the quality of our meat being at the forefront of his operation (Mortenson, 2016). Dr. Lawrence focuses so much on Prime steaks that he has gone to the extreme of cloning his prized meat grading cattle (Mortenson, 2016). He's not just trying to raise cattle but raise cattle with even more purpose for the consumer and rancher (Mortenson, 2016). Cloning is an advanced technology that could allow us to make prime the expected quality, not the exceptional quality.

Maybe not all ranchers are ready for this technology, or to put the proverbial steak on the plate, so to speak, since cloning isn't something we know everything about yet. There are still many unanswered questions and ongoing research. A pressing question seems to be, can you eat cloned meat? In a 2016 article, authors Hood and Mollard answer just this very question with research stating, "In 2008, the US Food and Drug Administration concluded that 'food from cattle, swine and goat clones is as safe to eat as food from any other cattle, swine or goat' (US: FDA approved section, para. 2). They also found that "not even scientists can distinguish a healthy clone from" your everyday livestock (Hood & Mollard, 2016, US: FDA approved section, para. 3). With that being said, the Center for Veterinary Medicine (2018) reminds us that:

It's important to remember that the primary purpose of clones is for breeding, not eating. Dairy, beef, or pork clones make up only a tiny fraction of the total number of food producing animals in the United States. Instead, their offspring would be the

animals actually producing meat or milk for the food supply. (Is it Safe to Eat Food from Clones? section, para. 1)

It also can be argued that cloning does have some flaws. Unfortunately, bargain shoppers will be discouraged when they do not find this advancement on the clearance rack. Cloning cats and dogs costs from “\$25,000-\$50,000”, and cloning a pristine race horse or grand champion steer starts at “\$85,000” (Horn Livestock, personal communication, March 19, 2015; ViaGen Pets, 2020). Aside from the cost, some challenges include that there is about a “25%” chance something may go wrong like edema or oversized offspring, which could potentially affect the donor animal (Regoli, 2018). Scientists may also have difficulty with how cloning has a major effect on the diversity of a species (Regoli, 2018). For example, if we cloned 20 grand champion steers and made them every cattle operation’s go-to bull, then we are reducing the genetic diversity for not only the single operation but also the species as a whole.

At the end of the day, however, cloning has a lot more benefits than having our most valuable bull’s genetics live on forever or a supermarket filled with great steaks (Mitol, 2006). Jennifer Mitol (2006) of ABC News reported that “farmers could raise cloned animals to supply organs for transplantation into humans” (Cloned Prized Bulls and Organ Farms section, para. 1). For instance, pig heart valves are transplanted into human patients every day to save lives (Hansman, 2015). If we could clone the pig with perfect heart valves, aren't we doing a lot more good than harm? How many more lives would we change if livestock could be on the donor list too? Police dog’s genes are getting cloned because of their ability to solve crimes we can’t (CBS News, 2019). Nat Geo says we may even use this technology to “bring back extinct species like the Woolly Mammoth or Giant Panda” (National Geographic Society, 2019, para. 7). Cloning is the option we have to make these advancements a reality,

even at our favorite steakhouse. With all of our beef-loving Americans in mind, don't you think it's time to raise the "steaks" for cloning?

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