The Unbreakable Chain

Computer code, multiuser databases and math may change verification in the beef business.

by Miranda Reiman, *senior associate editor*

Anybody who kept some of their most prized teenage possessions in a high school locker secured with a combination lock is familiar with the idea that a set of randomized numbers can offer protection.

Blockchain is kind of like that — only much more advanced, a lot more interconnected and completely reliant on a larger network.

Although the idea of blockchain existed for years before the technology required to run it caught up, it took another handful of years before it found footing in the beef business.

Today, cattle producers are exploring ways to use blockchain to communicate information about animal genetics, handling and management to others in the industry.

"They're wanting that information out there. They want people to know the way these animals are handled and treated and what goes on with them," says Drew Persson, a Wyoming commercial Angus producer and founding member of BeefChain.

His organization was the first in the country to sell cattle verified by this technology, so he's well-versed on the subject, but admits it's hard to grasp.

"It's one of those things that seems really complicated until you jam enough of it in your brain, and all of a sudden, it clicks," Persson says.

What is blockchain?

Essentially, a blockchain is a ledger of transactions, Persson says.

It's a decentralized way to store encrypted data, or accounting that's not backed up on one single server or server network.

Each block, or segment of data, is linked to the next by part of the data that is behind and ahead of it, thus forming a linked blockchain. The blocks are validated by mining (or basically a complicated math equation completed by a third party), and once the blocks have been validated, that data cannot change. It's essentially hack-proof, Persson says.

"Because of the way it all works, you would have to alter all the transactions that happened before it, and you would have to keep up with all the transactions that are happening. So, you would never be able to go back and keep up forward," he says. "You just wouldn't have enough computing power."

When people hear blockchain, they often automatically think of bitcoin, the earliest form of cryptocurrency, but bitcoin does not equal blockchain. Rather, it runs on blockchain.

Beyond currency, there are many business uses for blockchain including food safety, supply chain management and insurance.

In the beef business, BeefChain began its pilot project in 2017, to find ways to help Wyoming producers capitalize on information sharing. Earlier this year Zoetis announced the inception of Blockyard™, the company's effort to offer cattlemen a way to manage and share information on cattle from multiple sources. Many of beef's biggest customers are using the technology or forming partnerships to do so.

If you haven't heard of it yet, prepare to hear about it a lot more, Persson says.

Early adventures in blockchain

At Persson Ranch, south of Gillette, Wyo., they'd been running program cattle for several years.

"We got a good return on our investment for it, and our calves did well selling them that way," Persson says, "but it was just a question of, 'How do you know that information is staying with those calves?'"

Persson notes they had to trust at the processing or retail or foodservice level their information wasn't being assigned to a larger number of calves commingled in those phases.

"I'm sure consumers were pretty worried about that, too," he says.

As he and his family learned about blockchain, they got interested in its applications. They were already using radio frequency identification (RFID) tags, so they and a few other partner

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ranches formed BeefChain and put the cattle on a blockchain.

"So that kind of made waves in the blockchain community, and it was kind of cool, but there wasn't really any reason for a large number of ranchers to do that," Persson says. "Most of the ranchers we deal with, once they sell their cattle to the guy who owns the feedlot, they don't know where they go after it, and there wasn't really a return on investment to get involved."

BeefChain then added USDA process-verified programs (PVPs) to its offerings to be sure ranchers had a way to get paid now, betting on the outcome.

Early premiums on the blockchain-verified cattle are hard to discern from the PVP premiums already in place, but University of Wyoming research shows 99% of consumers would be willing to pay more to know exactly where their steak came from, Persson notes.

That's why BeefChain is continuing to innovate. They now have a steak pick with a QR code that leads to a website.

"When it comes out on a customer's table, they can scan that QR code with their phone," he says.

They can hear from the rancher in a video and learn more about the place and practices used there.

"We're just kind of doing it as a pilot project learning how much would a rancher be willing to pay for that service and the restaurants are interested," Persson says.

Another new avenue

At the start of 2022, Zoetis rolled out Blockyard as a "platform ecosystem for communicating information about an animal from one operation to the next," says Justin Sexten, head of industry and network partnerships with Precision Animal Health at Zoetis.

Basically, it's a way producers can take records from various points of production and grant permission to those further down the line to use.

"There are lots of different programs around animal health, feed management, preconditioning — I could list 25 different ones — Blockyard standardizes the information into the same system while adding a layer of genetic potential on top of that," Sexten says. "Our goal is not to displace but to better inform the marketplace in a way."

Using their platforms, cattlemen can take records within the Zoetis umbrella, such as Performance Ranch or from outside sources, and then upload that data to the cloud-based Blockyard.

"If they start with a genetic test, that would serve as a fingerprint of sorts for the animal, and then anywhere in the process that the animal or its meat is genomically tested, that information would be tied to that individual," Sexten says.

The seedstock sector is dialed into genetic tools because they stand the most benefit from them, Sexten observes.

"The feedyard is traditionally not a high adopter of genetic selection technology because by the time they [get results], they've already bought them, they've already trucked them and they're going into a pen that can't manage an individual animal by its genetic potential," he says. "I can't justify genetic testing after I've already spent the dollars to buy the cattle."

However, if they had the information before the purchase, could they put it to use?

"The sorting stick is one of the powerful tools we have. High-performing to the right, low-performing to the left. We'll feed them accordingly. One is 180-day cattle, one is 210, for example," Sexten says.

As management advances at the feedyard level, that information may become more and more important from accurately bidding on cattle to individually managing them.

Future solutions

The idea is that this technology may turn lot-level decisions into per-head level ones in the future.

"What we're looking to do is provide a mechanism at the time of a decision … one of the eight times you have an animal captive, you have to have the information to act on it," he says.

If they're not there, they're close.

"Today I'm going to inform your buying decisions. Tomorrow I will be able to inform your management at

an individual-animal level, if you can execute it," Sexten says.

With the advent of smart contracts, or an agreement written into the code, a rancher could request the data, such as performance and carcass records, be shared back with them. They could learn whether their cattle make meat that goes to a big city steakhouse or whether it goes to a lower-quality chain.

"They would know these are proven winners right here or I need to change something up in my breeding program because my steaks aren't finishing that great," Persson says.

Even though early adopters may not yet see the additional benefits of blockchain, that reality is near.

For most people who sell a set of cattle managed in a specific way, communication of that information relies on a relationship between buyer and seller. It's either a personal relationship or transferred through a PVP.

With blockchain, it's possible to share information with complete strangers.

"Ultimately the choice they have is that they can share with essentially everybody in the supply chain, or just with potential buyers," Sexten says.

"We're building on top of this digital evaluation that started years ago. I no longer have to make the connection from the cow-calf operator to the feedyard. Those two parties can be completely anonymous to each other, and the data can be shared securely."

Or put another way, "The blockchain model gives you the ability to trust the data without necessarily knowing the data provider," he says.

It also allows for that information to remain true, even if a group covered under the same PVP gets split up or sorted further.

Business as usual still an option

It's unclear which are more common: cattlemen who want to share more data or those who would prefer to share less, but Sexten says the latter already have that option.

"The marketplace for that exists today. You can market cattle in a completely anonymous manner today, so we're not looking to address that marketplace. We're looking to provide a mechanism for the people who are doing the right things and want to communicate that going forward," he says.

Back in Wyoming, Persson says he understands concerns about sharing personal data, but he thinks this gives a cattleman more control over who knows what.

"If you have a bank account, your information is out there. And if you're worried about the government knowing how many head you have, you're already paying income tax on the animals you sell, so they've already got a pretty good idea," he says.

Persson predicts blockchain will become mainstream in the near future, and Sexten agrees.

"I think there are a number of those people out there who have worked for many, many years to do the right things and just haven't figured out how to communicate it," Sexten says. "I get a lot more questions on 'how' than 'why.' There are many fewer people who don't see where this could go than there are people who are trying to figure out how to participate." AJ