

Blockchain: Potential Applicability in the Feed Industry

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Key Points

- Blockchain has not been leveraged across the feed supply chain
- Bulk commodity complexity and lack of incentive may limit blockchain in the feed supply
- High value and discreetly packaged animal feed products would be easier entry points

As we learned previously, blockchain technology has developed quickly and is being applied to many food and agricultural sectors. However, there are no current blockchain examples in animal feed. Most of the blockchain projects in the food industry have concentrated on products that are comparatively easier to trace and track. Similarities would exist for discreetly packaged products (or individual contained units) within the feed supply chain. However, there has been no successful blockchain implementation case for bulk commodities yet, which is the common form of ingredients in animal feed.

As with all new technology applications, implementing them in the feed supply chain has both pros and cons. Some will be similar to the overall technology application, but others will preferentially affect the feed industry. Benefits of blockchain technology in the feed supply chain include improved time efficiency and improved feed safety through enhanced transparency. Like other applications, transaction time for interactions in the feed supply chain will be reduced because the information intensity is enhanced within the network. There is always a desire in the industry to work more efficiently by utilizing modern information technology.

Feed safety requirements are similar to food safety, thus many of the improvements to and pilots of blockchain in the food industry will be applicable. Feed security and safety is expected to be enhanced with improved access to digital records including final product quality characteristics, implementation of preventive controls, results from third-party audits, and traceability. In addition, the enhanced transparency will improve supplier's and customer's sense of responsibility and the regulation in each phase of harvesting, producing, shipping, and distributing. When the information of every single transaction is shared among stakeholders, people will be more likely to obey rules and requirements in feed production and transportation. These potential benefits may be realized for both discreetly packaged and bulk commodity feed and feed ingredients.

Although many benefits are possible, implementation of blockchain in the feed supply chain will face significant hurdles to implementation, especially when considering bulk commodities. Tracking and traceability are limited for the trade of commodities such as soybeans (Figure 3). Bulk commodities, as the common form of ingredients in animal feed, are more difficult to track than discreet or packaged products in existing blockchain projects. When raw commodities from many farms are mixed into the bulk, it is impossible to accurately track the products continuously in the subsequent transportation and distribution phases although emerging research is beginning to offer modeling approaches to address this hurdle (Comba et al., 2018).

In addition, honest and 100% participation is required for end-to-end transparency for both bulk and discreetly packaged products. Methods and standards will need to be developed to ensure honest participation. Standards may include aspects such as third-party verification and data

sharing protocols. This may be even be more complicated in the feed industry where companies may have simultaneous supplier, customer, and competitor relationships with each other.

Perhaps the most significant hurdle the feed industry will face is the lack of incentive to attract participants. The feed industry functions on thin profit margins and investment in a new technology needs to have very clear economic incentives. As a result, incentive or lack thereof will preferentially increase the difficulty of implementation for those feed ingredients, like commodities, where margins are weak. In the food industry, major companies can request/require their suppliers to join in the network (e.g. Walmart and leafy green producers) and establish processes for sharing data and addressing liability in the event of a foodborne illness outbreak. However, given the complexity of relationships in the feed industry, this may not be possible. It is also possible to build reputation and social responsibility incentives with the use of blockchain. However, the rewards would be longer term and perhaps out of reach for the feed supply chain (except in the case of specialty feeds such as pet food).

Blockchain applications offer the feed supply chain incredible benefits and efficiencies in the goal to improve feed safety and animal health. However, implementation of the technology will experience hurdles and will require consensus among the industry for standards and methods of data collection and sharing. In addition, the cost of entry to access the data and who will pay for it will be a driving factor in the success of blockchain technology adoption. And finally, it should be recognized that blockchain applications depend absolutely on the reputability and accuracy of the data included in the blocks that are recorded in the chain.

References: Comba et al. (2013). Methods for traceability in food production processes involving bulk products. *Biosystems Engineering*, 116, 51-63.

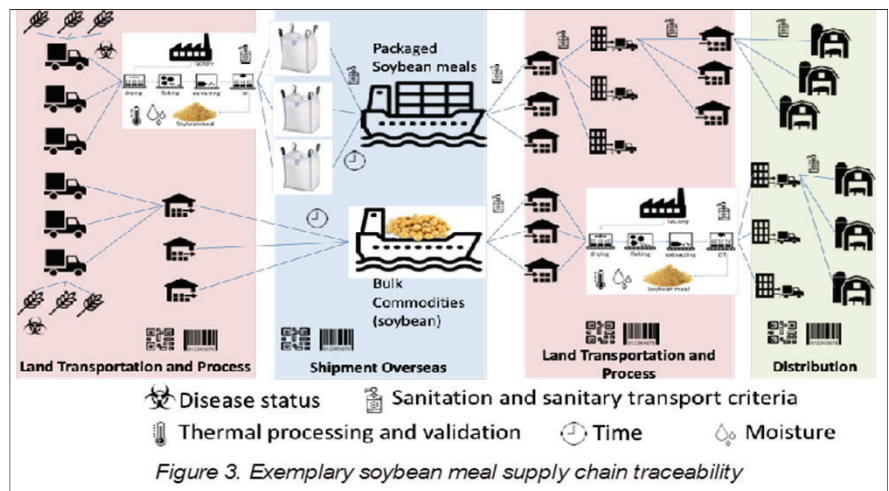


Figure 3. Exemplary soybean meal supply chain traceability