

Do tannins have a place in beef production?

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Tannins in livestock production

Tannins can be perceived as “antinutritional factors” in ruminant diets. Indeed, they are; however, when they are provided from low to medium concentrations (< 50 g/kg DM) tannins can improve utilization of feed protein without impairing feed intake or carbohydrate digestibility and there is a potential to also decrease enteric methane emissions from livestock. Tannins can increase the quantity of dietary protein, especially essential amino acids, flowing to the small intestine. This is of high value because protein is usually the most expensive component in ruminant diets.

Tannins as a mitigation strategy to reduce greenhouse gas emissions

Numerous scientists have reported enteric methane production being decreased with the use of tannins. For example, methane production per unit of dry matter was decreased by 17% in dairy cattle fed *Lotus corniculatus*, which is a legume known for its tannin content, when compared to ryegrass. In addition, this same group observed that cows consuming the *Lotus corniculatus* produced one-third more milk compared with cows consuming ryegrass. In addition, goats consuming lespedeza (*Lespedeza cuneata*), another legume, produced 57% less methane emissions (g/kg of dry matter intake) when compared to goats consuming a mixture of crabgrass (*Digitaria ischaemum*) and Kentucky 31 tall fescue (*Festuca arundinacea*).



Potential profit in beef cattle systems from the use of tannins

As mentioned, tannins have the capacity to decrease enteric methane emissions in cattle; however, research has reported increases in animal productivity. For example, a feedlot trial evaluating the effects of supplemental tannin on growth performance of Holstein steers observed that supplemental tannin (0.6% DM basis) increased ADG (6.5%), and gain:feed (5.5%; Rivera-Méndez et al., 2017). Furthermore, studies have shown that the incorporation of tannins on high-forage diets has increased ADG of beef steers by 0.55 lb more when compared to the control treatment (Min et al., 2006; Aboagye et al., 2018). When considering this increase in ADG over a 60-d grazing period, steers consuming low levels of tannins could gain an additional 33 lb when compared to steers not consuming tannins. With current feeder cattle prices, the producer has the potential to increase gross profit by feeding steers tannins. By improving animal performance with the use of tannins, the producer will make more profit and its production will be more sustainable because methane emissions from the animal and excreta can be decreased, a true win-win.

Upcoming research in Tifton focusing on tannins

We have an excited couple of years ahead of us here in Tifton. Recently, our team was awarded the opportunity to evaluate the impacts of tannins on beef production using a systems-type approach. We will start by grazing stocker cattle on ryegrass pastures and then follow those cattle into the feedlot. While on grass and the feedlot, cattle will receive either a control supplement/diet or a supplement/diet containing tannins. In this 2 year experiment, we will gather data from performance indices (ADG, forage and feed intake, gain:feed, carcass quality, etc.), enteric and excreta greenhouse gas emissions, and post-harvest beef analyses. Our team currently is made up of Drs. Darren Henry, Francine Henry, Jennifer Tucker, and Alex Stelzleni. Dr Darren Henry's PhD Student, Andrea Osorio, will lead the project for the next 2 years. We cannot wait to share the results with all of you!

References

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