



Whole Cottonseed – Common Questions and Opportunities for Use

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With the shift towards winter, many producers are making decisions on winter feed supplementation strategies for the cow herd. Whole cottonseed is a regionally available feedstuff that is a byproduct of cotton production. Cottonseed is known for its high nutritional value. The Nutrient Requirements of Beef Cattle publication, or the “gospel” reference guide for nutritionists, indicates that whole cottonseed is 90% TDN, 24% CP, and 20% fat. The combination of quality and availability makes whole cottonseed a commonly used feed-

stuff among cattle producers in the state, and it is an especially good feed for use in wintering the cow herd. Below are several common questions regarding its use in beef cattle diets:

Common Questions:

How much whole cottonseed should I feed my cattle?

The recommended inclusion rate in the diet is 0.5% of animal body weight, or about 20% of the total ration. This level of feed supplementation is due to the fat concentration in whole

cottonseed. In general, this equates to about 6 to 8 pounds per head per day for mature cows, and around 3 to 5 pounds per head per day for stocker cattle. Mature cows are sometimes fed free-choice whole cottonseed on farm. The fat in whole cottonseed serves as a consumption limiter in the diet. However, it has been shown that cattle often consume about 30 to 40% more than the recommended rate in free-choice settings. Because of the texture of whole cottonseed, stocker cattle may go through an acclimation period when learning to eat this feedstuff.

Is cottonseed going to make my bulls infertile?

This is one of the most frequently asked questions regarding whole cottonseed. Cotton plants contain gossypol, which is a predation defense compound produced by the plant. Gossypol causes infertility in insects that consume it. Many research studies have been conducted on feeding whole cottonseed to bulls. Gossypol can cause infertility in bulls when it is present at high levels in the diet. In studies where infertility was caused by feeding cottonseed, it is important to note that this was with 1) Pima cotton and 2) inclusion rates of whole cottonseed of up to 40% of the diet. Upland-type cotton is grown extensively in Alabama and is known to naturally contain lower levels of gossypol. To further support this point, a recent research trial at the University of Georgia evaluated the effect of whole cottonseed on bull performance and semen morphology of 16- to 18-month-old beef bulls. Bulls were fed whole cottonseed at 0.7% of animal body weight per day. Over the two-year study, bulls averaged 2.12 pounds per day average daily gain when fed whole cottonseed at 0.7% of body weight per day, and there were no differences in normal semen morphology. All bulls fed whole cottonseed as part of their diet passed a breeding soundness exam. This information illustrates that when fed at the recommended feeding rate, whole cottonseed can be used in bull diets or as part of a feeding program for the cow herd during the breeding season.

Opportunities

Over the last several years, our team has partnered with the Auburn Cotton Breeding Program, the Alabama Cotton Commission, and Cotton Incorporated to better characterize whole cottonseed feed quality characteristics across new and emerging cotton lines (or potential varieties) as well as how these characteristics impact consumption, passage, and digestibility of the seed.

In addition to these efforts, we have also worked with several cotton gins in the state to evaluate the use of baled gin byproduct (i.e., gin trash) as a feedstuff for mature cows. Many of you may be familiar with the “stacks” of gin byproduct often seen behind ginning facilities. This is loose gin byproduct. Some gins have started baling 500 to 600 lb bales of gin byproduct. This increases the ease of transportation by cattle producers. Samples from gins around the state have shown slightly increased quality of baled gin byproduct compared to loose byproduct. In a 60-day feeding trial with mature cows at Auburn University, we observed similar consumption of loose vs.

baled gin byproduct, which illustrates this as another potential resource for cattle producers.

Our team is continuing to conduct research on whole cottonseed. Our next steps include:

- Evaluation of variability in fat content of whole cottonseed. Fat is considered the “limiting factor” for the inclusion of whole cottonseed in the diet of beef cattle and has been shown to decrease forage digestibility. Together with the Auburn Cotton Breeding Program, we are examining fat concentrations across cotton lines and the genes that control this for future selection efforts.
- Evaluation of whole cottonseed digestibility. While fat and gossypol may be raised as concerns on whole cottonseed, its efficacy as a feedstuff is linked to how well it can be digested by the animal. In addition to screening for fat content, our team will be evaluating cotton breeding lines for digestibility by beef cattle.
- Passage rate dynamics of whole cottonseed. We mentioned that free-choice feeding of whole cottonseed is sometimes used as a production practice. However, some nutritionists have raised concerns that this may lead to increased seed passage (i.e., seed winding up in the manure) and decreased digestibility. Our team will be conducting feeding trials to determine the relationship between level of intake and passage rate of whole cottonseed.

The authors would like to thank the Alabama Beef Checkoff Program, the Alabama Cotton Commission, and Cotton Incorporated for their continued support of our research and Extension efforts regarding the use of cotton byproducts in Alabama.

For additional information on whole cottonseed and other cotton byproducts, visit our resources below by scanning the QR code with your device:

Cotton Byproduct Use in Beef Cattle Diets



Whole Cottonseed Use in Beef Cattle Diets



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