



# Vet Call

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## Cottonseed feeds for cattle

*Cottonseeds, a byproduct of cotton fiber production, can be a cost-effective supplement for beef cattle in some parts of the country. The four products most commonly utilized are whole cottonseeds, cottonseed meal, cottonseed hulls and cotton gin waste (a.k.a. gin trash).*

### Feeding considerations

**Cottonseed** does not need to be ground or rolled to be utilized by beef cattle; however, cottonseed can be de-linted, which improves its handling characteristics. Whole cottonseed is high in protein (22%), high in energy (96% TDN) and very high in fat (17.5%). Because of the high oil content, daily amounts should not exceed 5 pounds (lb.) in yearlings and 6-7 lb. in adult animals. Moreover, cottonseed should not be fed to cattle younger than 60 days. Cottonseed that has not been de-linted bridges easily in bins and does not auger well or flow well in feeders.

**Cottonseed meal** is high in energy (77% TDN) and protein [36% or 41% crude protein (CP), depending on the processing method]; and is low in calcium (Ca) and high in phosphorus (P). If high levels are fed, additional calcium may be needed in the diet. Cottonseed meal, in most circumstances, can be used to meet the

entire protein requirement of beef cattle. As with whole cottonseed, it should not be fed to very young cattle (i.e., < 60 days of age) due to concerns with gossypol.

**Cottonseed hulls** are often available as an inexpensive energy source (42% TDN), but they are low in protein (4% CP). Cottonseed hulls do not flow well through augers and some feed-handling equipment unless pelleted.

**Cotton gin waste**, or gin trash, is also useful as an inexpensive energy source. It is composed of short-fiber cotton unsuitable for processing into yarn. It also includes cotton burs, leaves, stems and soil particles. Like cottonseed hulls, it is low in protein and characteristically difficult to handle.

### Gossypol

Pigments (called gossypol) present in

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cottonseed are very toxic to young chicks, pigs, dogs and other simple-stomach animals. Because of the ability of the rumen environment to bind and inactivate gossypol, cattle are much more resistant to gossypol toxicity than nonruminants. However, problems can become apparent if large amounts are fed for several weeks. The effects of gossypol toxicosis appear to be worse if high environmental temperatures or other stressors are present.

Gossypol content of cottonseed meal is influenced by the species of cotton plant, the temperature and rainfall during the growing season, and the method of oil extraction. Storage of cottonseed meal does

not reduce gossypol content. Whole cottonseeds do not appear to be as likely to cause problems as cottonseed meal, and cottonseed hulls should not cause gossypol toxicity.

Most reported cases of gossypol toxicity in cattle have been either in calves before their rumen is functioning or in cattle fed high-concentrate rations with a high percentage of cottonseed meal.

Severe gossypol toxicity causing death is rare in cattle. However, fertility can be reduced in bulls and probably in cows with no signs of illness or reduced production. In cows, the action appears to be directly on the early embryo. In bulls, gossypol damages testicular tissue, which reduces the number of sperm produced and causes a defect in the sperm mid-piece (tail) that results in poor motility.

The toxic dose for free gossypol to cause reproductive problems in bulls appears to be around 31 milligrams (mg) per pound daily for several weeks (10 or more). Research has shown that feeding 4,000 IU of Vitamin E daily prevented the negative effects on sperm production caused by gossypol.

### Competitive feed source

Cottonseed products are commonly fed to cattle with no ill effects. Producers should consider cotton byproducts as a supplement when they can be delivered at a cost advantage to other protein and/or energy sources. Use of large amounts of cottonseed meal in diets of bulls and cows leading up to and during the breeding season should be done cautiously (or avoided) because of the potential negative effects of gossypol on fertility.

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