

## Thinking about feeding soybeans this year?

*Jason Smith*, Assistant Professor and Extension Beef Cattle Specialist, Department of Animal Science, University of Tennessee Institute of Agriculture

Low prices and adverse harvest conditions often drive us toward alternative options that – if nothing else – are perceived to add value to a crop. As the 2018 soybean crop is no exception to this, many operations that produce soybeans and also raise or feed beef cattle will undoubtedly consider feeding them. If this is true for your operation, make sure you first put pencil to paper.

Due to their nutrient density, low prices often give way to the perception that soybeans may be an economical source of supplemental energy and protein for beef cattle. While this may be true on occasion, under very limited circumstances, prices rarely dip low enough to make them the most economical option. For illustrative purposes, I'll use shelled corn and dried distiller's grains as references for comparison, as they are generally two of the most economical sources of supplemental energy and protein, respectively. In this scenario, I'll also set a price for shelled corn at \$3.75 per bushel, and price for dried distiller's grains at \$155.00 per ton.

Under these conditions, soybeans would need to be valued at less than \$5.34 per bushel to justify their use as the more economical source of supplemental energy for the cowherd, and less than \$5.50 per bushel for growing and finishing cattle. Similarly, soybeans would need to be valued at less than \$5.86 per bushel to justify their use as an economical alternative to dried distiller's grains as a source of supplemental protein for the cowherd or growing and finishing cattle. Due to their calculated nutrient costs, at prices above these thresholds, the most economical option would be to sell the beans, buy the corn and/or distiller's, and come out ahead by keeping the change.

And while these thresholds almost always differ across producers, and fluctuate on a regular basis, calculating nutrient cost, or cost per unit of nutrient, is a means by which these comparisons can be made, and thus the most economical option can be discovered. UT's supplemental feedstuff value calculator (W373) is a free Excel-based tool that can be used to make these comparisons, and is available through the UT Beef and Forage Center at [www.UTBeef.com](http://www.UTBeef.com).

For the scenarios in which price does justify feeding soybeans as the most economical source of supplemental protein and/or energy, keep the following rules of thumb in mind:

- Raw soybeans contain anti-nutritive factors. Heat applied during the roasting process destroys them, which is one reason why they are generally roasted as an initial step during processing. Cattle with a fully functional rumen can detoxify a large portion of these anti-nutritive factors, and thus can handle raw soybeans supplemented at low levels.
- Suckling calves do not have a fully functional rumen, and therefore cannot detoxify these anti-nutritive factors. This makes them toxic to the animal. Because of this, never feed raw soybeans to calves that have not been weaned and consuming feed other than milk for a considerable period of time.

- One of the anti-nutritive factors contained in raw soybeans interferes with the ability of cattle to detoxify urea, making supplemental urea toxic, regardless of the animal's age. Because of this, supplemental sources of non-protein nitrogen, such as urea or poultry litter, should never be fed to cattle that are also being supplemented with raw soybeans. Keep in mind that many commercial tubs and liquid feeds contain some amount of urea, unless the product is labelled as "all-natural." Always verify that other supplemental feeds do not contain added non-protein nitrogen before feeding soybeans. This information can generally be found in the "guaranteed analysis" section of a feed tag or product label. And if in doubt, consult with the manufacturer.
- Raw soybeans contain a considerable amount of oil. If the bean has become fractured, this exposes the oil to air, providing the opportunity for it to oxidize and become rancid. If raw soybeans are going to be ground prior to feeding, do so immediately prior to addition to the ration. Avoid grinding and storing beans for a considerable period of time prior to feeding.
- While the oil in soybeans provides a source of supplemental fat that is quite energy dense, high levels of dietary fat can limit digestibility of other portions of the animal's ration, and can cause digestive upset. Always consult with your nutritionist or Extension agent in order to determine the appropriate level of supplementation or optimal dietary inclusion rate.
- Adverse harvest conditions can allow for the development of mycotoxins in soybeans. Because of this, it is recommended to screen beans for mycotoxins prior to feeding – particularly those that were late-harvested, or underwent environmental stressors or adverse conditions during the growing or harvest season.