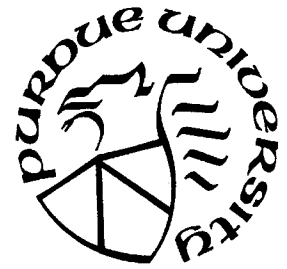


CROP AND LIVESTOCK



Update

Feeding Discounted "Green" Soybeans to Dairy Cattle and Swine

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If you have harvested some soy beans this fall and they were killed by a sharp freeze prior to full maturity, inspect the beans for color before selling them. If greater than 7% of the beans have green color, this may lead to rejection or a very large discount by the elevator. This discount is justified because the green color remains in the oil after processing. It is expensive to remove, and the oil has a resulting shorter shelf life. If the beans are allowed to dry to the proper moisture content and stored properly, they are still of good nutritional value as a livestock feed for swine or dairy cattle.

Normal "yellow" soybeans typically contain 18.5% oil and approximately 38% crude protein. Immature "green" soybeans are generally 2 to 3% lower (16% oil) in oil content. This translates to 10% less energy but about the same protein level and digestibility as normal beans. The base price of beans and soybean meal, the level of discount, and the cost of processing are the important economic factors in deciding to roast or sell soybeans. Calculating the economics between selling or feeding the beans can be done using the following equation:

$$\text{Advantage of whole soybeans} = .86 (\text{cost/ton of 44\% SBM}) + .17 (\text{cost/ton of fat}) - (\text{value of 1 ton of soybeans} + \text{cost of roasting/ton}).$$

If the number is positive, then it would be advantageous to roast beans and feed them, if it is negative you are better off selling the beans and buying back the soybean meal and feed grade fat.

Feeding raw beans to swine is not recommended because of two anti-nutritional factors, the enzyme urease and the protease inhibitors which bind to the animal's own enzyme trypsin. The binding of the enzymes renders them ineffective for digestion of feed proteins. Both of these anti-nutritional factors can be deactivated by heating of the soybean. The minimum temperature required for deactivation of these factors is 225° F. Most roasters will have operating temperatures between 230 and 260° F with a 2 to 6 minute retention time. It should be noted that roasting at a temperature too high or for too long a time may cause increased splitting, burning, or tying up of the soybean protein, a negative for swine.

Dairy cattle on the other hand generally benefit from further heat processing. A temperature of 290° F and a "steeping" for 20 minutes in a covered tank or bin is recommended. This is because heating to higher temperatures helps to increase the undegraded or "by-pass" protein level, a factor that can benefit high producing dairy cattle. Because the microbes in a cow's rumen deactivate, some of the urease and trypsin inhibitor in raw beans they can be feed to dairy cattle up to 4 lbs per day. With heat processing, roasted beans can be feed up to 8 to 9 lbs per day, supporting very good production and serving as an economical fat and protein source for dairy cattle. Roasting soybeans in a commercial roaster is recommended because trying to roast beans to high enough temperatures in a grain dryer could result in a dryer fire or under

roasted beans.

Several feed mills and elevators in the northern Indiana, Michigan and Ohio areas have bean roasters and several operators with portable commercial roasting equipment are available. Simple calculations can be made considering the cost and benefits of heat processing green soybeans for swine or dairy cattle, compared to selling the beans at a discount.

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