

ROASTED SOYBEANS ARE AN ECONOMICAL SUPPLEMENT FOR RUMEN UNDEGRADED (By-Pass) PROTEIN

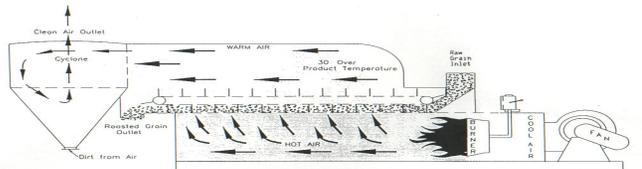


Background

- The protein in most forages, especially ensiled forages, is easily degraded in the rumen.
- Therefore, high producing dairy cows almost always benefit from the addition of some protein that is not so easily degraded in the rumen.
- Properly heated soybeans can be an excellent source of rumen resistant protein.
- Heat causes formation of linkages between protein and sugars, making the protein less vulnerable to breakdown in the rumen.

How to properly heat soybeans

- Can be roasted, or heated by extruding under high pressure.
- Soybeans need to be heated to 290-300°F, and then held without cooling for about 30 minutes to maximize the heating benefit.
- Roasted soybeans should be broken into halves and quarters, but not ground.



Cow response

- When properly heat-processed soybeans replace raw soybeans or soybean meal in the dairy diet, milk production typically is increased 2-3 lbs per cow per day.
- Heat processed soybeans are very palatable.
- Soybeans contain 18% oil, so they are an excellent energy source as well as a protein source for high producing cows.

Economics of Roasting Soybeans on the farm

- Purchase 1 ton of soybeans (33.3 bu) for \$4.50/bushel, or \$150 per ton.
- Roast on the farm for \$28 per ton. (\$8.00/ton for energy, \$4.00/ton for labor, and \$16.00/ton for maintenance and amortizing equipment.)
- For \$178 per ton of soybeans roasted, there will be:
 - 370 lb rumen undegraded protein
 - 304 lb rumen degraded protein
 - 2,160 Mcal of net energy for lactation.
- A ton of 48% CP soybean meal may be purchased in semitruck lots at about the same price - \$178 per ton. This will contain:
 - 308 lb rumen undegraded protein
 - 660 lb degraded protein
 - 1,810 Mcal of net energy for lactation.
- If rumen undegraded protein and net energy are limiting in the lactating cow diet (which they almost always are), then the roasted soybeans compare very favorably.

Economics of Purchasing Roasted Soybeans from a Feed Company

- Under most conditions, one ton of properly processed soybeans are worth about \$100 more than one ton of conventional soybean meal, based on milk production response from feeding heated soybeans.
- Commercial processors typically charge \$20-30/ton for roasting and an additional \$20-40 for various marketing costs and profit. This leaves about \$30-60/ton benefit for the dairy producer to claim.
- Some processors will custom roast producers' soybeans for \$20-40/ton, thus leaving a larger margin (\$60-80/ton) for the dairy producer to claim.

Take home message!

- World wide increases in vegetable oil production, and increased demand for high protein meals for poultry and swine production, have led to a relative reduction in value for soybean oil, and a relative increase in value for the meal. This makes feeding of the whole soybean more feasible. This, combined with heat treatment to enhance utilization of the protein in soybeans by the dairy cow, makes feeding of heat processed soybeans an attractive option.

