



West Central News

by Dr. Jesse Goff
Director of Research &
New Product Development

What is the fat in SoyPLUS® worth to you?

West Central's expellers process gives SoyPLUS over 6% fat as fed (7% DM), compared to 1-1.5% fat in hexane (solvent) extracted soymeal and high bypass meals made from hexane extracted meals. A ton of SoyPLUS will have nearly 100 pounds more fat than solvent extracted meal. Currently, soy oil costs 46¢ per pound. Additionally, soy oil is about 50% linoleic acid (C18:2). Providing higher amounts of absorbed 18:2 and 18:3 essential fatty acids can improve reproductive performance (Thatcher et al., 2006). With beef tallow at 32¢ a pound, it would cost about \$32/ton to supplement solvent extracted soymeal to provide similar energy, but you would not be getting the essential fatty acids.

Feeding unsaturated fatty acids may improve embryo viability, but it can also reduce milk fat concentration. This is because some of the unsaturated fatty acids may be converted by microbes in the rumen to trans-10, cis-12 conjugated linoleic acid (C18:1 trans). As little as 3-5 g of this compound entering the blood of the cow will cause a profound decrease in milk fat content. Fortunately, the expellers process used to produce SoyPLUS imparts a degree of rumen bypass to the fat in SoyPLUS that is not observed with fat derived from most other feedstuffs. About 32% of the fat in SoyPLUS will bypass the rumen (Chalupa et al., 2002), meaning 32% of the fat in SoyPLUS cannot be converted to C18:1 trans compounds that might impair milk fat production. It also means 32% of the linoleic acid in SoyPLUS will reach the small intestine and be absorbed to aid reproduction in the cow. Less than 3% of the fat

in solvent extracted soybean meal, cottonseeds, ground corn, or crushed canola seeds is bypass fat. Ground roasted soybeans does a little better with about 17% rumen bypass fat. (Chalupa et al., 2002). Calcium salts of unsaturated fatty acids are highly prized for their ability to provide rumen inert fat to the cow – yet only about 55% of the fat in many of these products actually escapes lipolysis in the rumen.

Including 2 kg of SoyPLUS in the daily ration of the cow provides 120 g fat, of which 50% is linoleic acid. Nearly 20 g of this linoleic acid can bypass the rumen, leaving 40 g linoleic acid that can potentially be converted to C18:1 trans and reduce milk fat. However, keep in mind, corn silage is about 3.2% fat and when fed at 10 kg DM/day will bring 320 g fat to the ration. This fat is about 47% linoleic acid so the corn silage brings about 150 g linoleic acid into the diet. Unfortunately, the fat in corn silage has almost no ability to bypass the rumen, and therefore poses a greater potential for milk fat depression. The fat in SoyPLUS is selling for about 17¢-19¢ per pound, a real bargain when you consider that it provides energy and essential fatty acids in a form that minimizes the risk of milk fat depression.

Thatcher WW, Bilby TR, Bartolome JA, Silvestre F, Staples CR, Santos JE. Strategies for improving fertility in the modern dairy cow. *Theriogenology*. 2006 Jan 7;65(1):30-44. .

Chalupa, W; P Moate, and R. Boston. Ruminant metabolism and intestinal digestion of fatty acids. *Proceedings of the 2002 Southwest Nutrition Conference*, Phoenix, AZ, pp 85-102.

SoyChlor®

SOYPLUS® The
GOLD
STANDARD
of dairy feed
ingredients

West Central • Ralston, IA
1-800-843-4769