

Ruminal Fermentation of Processed and Heat-treated Sunflower Seeds

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There is limited work describing the effect sunflower seeds have within the rumen. Sunflower seeds contain approximately 35 to 45% fat. One of the unique features of the sunflower seed is the fibrous nature of the seed coat. Essentially the seed coat acts to protect the oilseed from rapid degradation in the rumen therefore minimizing the risk of rumen upset. It is critical for cow health to maintain a stable rumen environment, in particular when feeding an oilseed. Once the rumen microbes begin to degrade the sunflower seed, those nutrients that disappear from the rumen provide us with an indication of the nutrients available for milk production.

The objective for this study: 1) to determine the effect of processing (rolled versus whole), heating (roasted versus raw), and incubation time (24 h versus 48 h) on ruminal disappearance. Four treatments were incubated in the rumen: 1) Whole Raw sunflower seeds (SF), 2) Whole Roasted SF, 3) Rolled Raw SF, and 4) Rolled Roasted SF. Each treatment was incubated in the rumen for periods of 24 h and 48 h. Our goal when manually rolling the seeds was to partially expose the oilseed without destroying the structure of the seed.

Dry matter and fat disappeared from the rumen significantly with the rolled SF. Whole seeds took longer to degrade in the rumen. Rumen microbes fermented more dry matter and fat from roasted SF. Raw SF resulted in an increase in protein disappearance. Heat-treating the sunflower seeds protected the protein from rumen degradation. Fiber disappearance in the rumen showed no differences between treatments.

Take Home Message: Sunflower seeds when roasted or rolled effectively increased dry matter and fat disappearance in the rumen. Such rumen dynamics provide valuable information on nutrient availability in the rumen and the potential for dairy production.