



FATS AND PROTEINS RESEARCH FOUNDATION, INC.

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THE DIRECTOR'S DIGEST
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TALLOW-COATED UREA FOR RUMINANT FEEDING

More than 200,000 tons of urea are used in ruminant feeds in the United States each year. Much larger quantities would be fed if the rate of ammonia release in the rumen could be controlled. Theoretically this could be accomplished by coating the urea prills with some material that would prevent the rapid conversion to ammonia. Ideally the coating material should be relatively cheap, easily applied and add to the nutritive value of the ration.

Animal fat should meet these requirements and researchers at Battelle Memorial Institute, under contract with FPRF, have been attempting to coat urea with hydrogenated tallow. For this a fluidized bed encapsulation process was selected. Basically the process consists of spraying molten tallow into a fluidized bed of urea so that the tallow freezes on the surface of the urea particles. Coating thickness can be readily controlled by bed temperature, time of exposure, rate of tallow pumping and other operating conditions.

Coated urea samples were subjected to leaching tests. Leaching rate was influenced by the level of fat coating and also by the bed temperature used for coating as shown by the data in Table 1.

Table 1. Effect of Bed Temperature on Leaching

<u>Coating</u>	<u>Bed Temp.</u>	<u>Urea Leached</u>
%	°F.	% in 2 hrs.
10	100	93
11	120	34
16	120	24
18	108	71
24	110	64
25	119	12

Samples of coated urea were sent to Professor William Tyznik, Ohio State University, and fed to sheep fitted with rumen cannulae. The level of urea in the rumen, blood, urine and feces was determined at appropriate intervals after feeding. Preliminary results show that coating urea with fat did indeed slow the release rate of urea in the rumen. Also the release rate in the rumen correlated well with the release rate shown by laboratory leaching tests.

Much more research will be required to establish the exact conditions required for the urea coating. This will need to be integrated with actual cattle feeding trials using urea coated to different levels. If this research yields favorable results, a large volume outlet for animal fats would result since it has been estimated that an additional 200,000 tons of coated urea would be used. At a 20% fat coating level this would require 40,000 tons of tallow per year.

FPRF RESEARCH RESULTS PUBLISHED

Reprints of five papers describing results from FPRF-sponsored research are enclosed. We hope that you find these interesting and valuable.