

Thaniya Pathomsubannakul 2008: Utilization of Heat-treated Full Fat Soybean as a Source of By-pass Protein in Ruminant Feed. Master of Science (Animal Nutrition and Feed Technology), Major Field: Animal Nutrition and Feed Technology, Department of Animal Science. Thesis Advisor: Assistant Professor Lerchat Boonek, Ph.D. 85 pages.

Three experiments were conducted to study the use of heat-treated full fat soybean as a source of by-pass protein in ruminant feed. Experiment 1: the protein degradabilities of heat-treated extruded full fat soybean were evaluated by the *in sacco* nylon bag method using 2 rumen fistulated dairy bull. The heat-treated full fat soybean was produced by heat steeping of full fat soybean post extrusion either for 0, 15, 30 or 45 minute. The results of CP degradation characteristics showed that control treatment (0 minute steeping time) gave the highest and the 45 minute steeping time gave the lowest CP disappearance ($p < 0.05$) at 24 h of incubation time. Effective degradability of the CP (EDCP) at 8% per h of solid out flow rates was significantly ($p < 0.05$) lower for the extruded full fat soybean with 45 min of heat steeping time than that of the control. The results indicated that rumen degradable protein (RDP) of extruded full fat soybean with heat steeping for 45 minute was 31.35 g per 100 g of protein. Experiment 2 was conducted to determine the effect of heat-treated full fat soybean in diet of lamb on feed digestibility, N retention and performance of lambs. 15 lambs were randomly allocated to 3 experimental groups in completely randomized design trial. The animals received total mixed ration containing concentrate and sugar cane silage in the ratio of 70:30. Either soybean meal, extruded full fat soybean or heat-treated extruded full fat soybean were main protein sources of TMR1 TMR2 and TMR3 respectively. The results showed that there were no differences of dry matter and crude protein digestibility among experimental groups ($P > 0.05$). N retention in lambs received TMR1 is numerically lower than those of lambs in TMR2 and TMR3 while feed efficiency of lamb received TMR3 tended to be improved ($P = 0.09$) compared to other groups. Consequently lambs received high rumen undegradable protein diet showed tendency of positive response on productive efficiency. Experiment 3 was carried out to study the effect of heat-treated full fat soybean on blood metabolite and rumen fermentation in dairy bull and performance of dairy cows. 3 dairy bulls and 6 dairy cows were randomly allocated to 3 experimental groups in change-over design trials. Either, soybean meal, mixed soybean meal and heat-treated extruded full fat soybean or heat treated extruded full fat soybean were main protein sources of TMR1 TMR2 and TMR3 respectively. The results showed that there were no differences among treatments in the cows' dry matter intake milk yield and milk composition. However milk fat was low as compared to standard values. Therefore, consideration of its effect on milk fat composition and level of roughage used is important when full fat soybean is included into dairy diet.

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