

## RINGKASAN

**NUGRO TRI WICAKSO.** Penelitian yang berjudul “Aktivitas Protease Cairan Rumen dan Kecernaan Protein Kasar Pakan Kambing yang Mendapat Suplementasi Sulfur dan Asam Isobutirat” telah dilaksanakan pada tanggal 20 Desember 2016 sampai dengan 17 Januari 2017 di Laboratorium Ilmu Nutrisi dan Makanan Ternak, Fakultas Peternakan serta Laboratorium Riset Universitas Jenderal Soedirman. Tujuan penelitian mengkaji pengaruh suplementasi sulfur dan asam isobutirat serta pengaruh interaksi antara keduanya terhadap aktivitas protease cairan rumen dan kecernaan protease kasar pakan kambing.

Materi yang digunakan antara lain pakan basal yang terdiri dari rumput lapang dan konsentrat dengan imbang 60:40 %, cairan rumen dari 3 ekor kambing Jawarandu yang diambil di Rumah Pemotongan Hewan (RPH) Sokaraja segera setelah kambing dipotong. Konsentrat yang digunakan tersusun atas dedak padi 22%, pollard 3,3%, dan bungkil kelapa 14,67%. Penelitian dilaksanakan menggunakan metode eksperimental secara *in vitro* dengan Rancangan Acak Lengkap (RAL) pola Faktorial 3 x 3 yang terdiri dari 9 perlakuan dan 3 kali ulangan. Faktor pertama (A) yaitu suplementasi sulfur yang terdiri dari 3 taraf yaitu 0% ( $a_1$ ), 0,3% ( $a_2$ ), dan 0,6 % ( $a_3$ ), faktor kedua (B) yaitu suplementasi asam isobutirat yang terdiri dari 3 taraf yaitu 0 mM ( $b_1$ ), 0,2 mM ( $b_2$ ), dan 0,4 mM ( $b_3$ ). Perlakuan pada penelitian ini yaitu  $a_1b_1$ : pakan basal + sulfur 0 % + isobutirat 0 mM,  $a_1b_2$ : pakan basal + sulfur 0 % + isobutirat 0,2 mM,  $a_1b_3$ : pakan basal + sulfur 0% + isobutirat 0,4 mM,  $a_2b_1$ : pakan basal + sulfur 0,3 % + isobutirat 0 mM,  $a_2b_2$ : pakan basal + sulfur 0,3 % + isobutirat 0,2 mM,  $a_2b_3$ : pakan basal + sulfur 0,3 % + isobutirat 0,4 mM,  $a_3b_1$ : pakan basal + sulfur 0,6 % + isobutirat 0 mM,  $a_3b_2$ : pakan basal + sulfur 0,6 % + isobutirat 0,2 mM,  $a_3b_3$ : pakan basal + sulfur 0,6 % + isobutirat 0,4 mM. Variabel yang diukur yaitu aktivitas protease cairan rumen dan kecernaan protein kasar. Data dianalisis menggunakan analisis variansi (ANAVA) dan dilanjutkan dengan uji *orthogonal polynomial*.

Hasil penelitian menunjukkan bahwa suplementasi sulfur dan interaksi antara suplementasi sulfur dengan asam isobutirat tidak berpengaruh ( $P>0,05$ ) terhadap aktivitas protease, namun demikian semakin tinggi taraf suplementasi asam isobutirat maka aktivitas protease semakin menurun. Interaksi antara suplementasi sulfur dengan asam isobutirat berpengaruh sangat nyata ( $P<0,01$ ) secara kuadrater menurunkan kecernaan protein kasar yaitu pada titik minimum  $P_{A0}$  (0,38 ; 6,70) dan  $P_{A1}$  (0,36 ; 6,57) serta pada titik maksimum  $P_{A2}$  (0,21 ; 17,21).

Semakin tinggi taraf suplementasi asam isobutirat, aktivitas protease cairan rumen semakin menurun. Semakin tinggi taraf suplementasi sulfur, kecernaan protein kasar pakan semakin meningkat.

Kata kunci: Protease, kecernaan protein, sulfur dan asam isobutirat

## SUMMARY

**NUGRO TRI WICAKSO.** The study was entitled “Protease Activity of Rumen Fluid and Crude Protein Digestibility of Goat Feed that Supplemented by Sulfur and Isobutyrate Acid” was conducted since December 20<sup>th</sup> 2016 until January 17<sup>th</sup> 2017 centered in the Animal Nutrition and Feed Science Laboratory, Animal Science Faculty and Laboratory of Research, Jenderal Soedirman University. The aim of this research was to assess the influence of sulphur and isobutyrate acid supplementation and their interaction on protease activity of rumen fluid and crude protein digestibility of goat feed.

The materials used were basal feed that consisted of field grass and concentrate with a ratio of 60:40%, rumen fluid of Jawarandu Goat from abattoir in Sokaraja immediately after the goat were slaughtered. The concentrate was composed of rice bran 22%, pollard 3.3%, and coconut meal 14.67%. This research was conducted by using experimental method based on Completely Randomized Design (CRD), factorial pattern (3x3) with 9 treatments and 3 repetition. The first factor (A) was sulphur supplementation, there were 0% ( $a_1$ ), 0.3% ( $a_2$ ), and 0.6 % ( $a_3$ ). The second factor (B) was isobutyrate acid supplementation, there were 0 mM ( $b_1$ ), 0.2 mM ( $b_2$ ), and 0.4 mM ( $b_3$ ). The combination treatments given were  $a_1b_1$ : basal feed + sulphur 0% + isobutyrate acid 0 mM,  $a_1b_2$ : basal feed + sulphur 0% + isobutyrate acid 0.2 mM,  $a_1b_3$ : basal feed + sulphur 0% + isobutyrate acid 0.4 mM,  $a_2b_1$ : basal feed + sulphur 0.3% + isobutyrate acid 0 mM,  $a_2b_2$ : basal feed + sulphur 0.3% + isobutyrate acid 0.2 mM,  $a_2b_3$ : basal feed + sulphur 0.3% + isobutyrate acid 0.4 mM,  $a_3b_1$ : basal feed + sulphur 0.6% + isobutyrate acid 0 mM,  $a_3b_2$ : basal feed + sulphur 0.6% + isobutyrate acid 0.2 mM,  $a_3b_3$ : basal feed + sulphur 0.6% + isobutyrate acid 0.4 mM. The parameters measured were protease activity of rumen fluid and crude protein digestibility. Data were analyzed using Analysis of Variance (ANOVA) advanced with orthogonal polynomial test.

The result of this study showed that supplementation of sulphur and interaction between sulphur and isobutyrate acid did not significantly affect ( $P>0.05$ ) protease activity, but higher isobutyrate acid supplementation, protease activity becomes more decrease. The interaction between sulphur and isobutyrate acid supplementation was highly significant affected ( $P<0.01$ ) in a quadratic decrease of crude protein digestibility at a minimum point  $P_{A0}$  (0.38 ; 6.70) and  $P_{A1}$  (0.36 ; 6.57) also at a maximum point  $P_{A2}$  (0.21 ; 17.21).

The conclusion of the study is, higher supplementation of isobutyrate acid, protease activity of rumen fluid becomes decrease at a higher level. Higher supplementation of sulfur, crude protein digestibility of feed increases at a higher level.

Keywords: Protease, protein digestibility, sulphur and isobutyrate acid