RINGKASAN

Penelitian ini bertujuan untuk mengkaji pengaruh suplementasi tepung daun waru (TDW) dan *direct-fed microbials* (DFM) terhadap kadar VFA, NH_3, total protozoa, sintesis protein mikroba (SPM), aktivitas selulase, amilase, protease dan diuji kualitatif menggunakan native page dan zymografi dalam cairan rumen sapi potong. Penggunaan tepung daun waru mengandung senyawa antiprotozoa yang dapat menurunkan total protozoa di dalam rumen sehingga dapat meningkatkan efisiensi pakan.

Penelitian dilakukan secara eksperimental berpola faktorial menggunakan rancangan acak lengkap (RAL). Faktor pertama adalah tiga taraf DFM yang dicampurkan pada jerami padi yaitu P1 = 0, P2 = 0,5, P3 = 1 (% bahan kering jerami padi) faktor ke dua adalah tiga taraf suplentasi TDW dalam konsentrat yaitu D1 = 0, D2 = 0,24., D3 = 0,48 (% bahan kering konsentrat) Sehingga diperoleh sembilan perlakuan yang tiap perlakuan diulang tiga kali. Pakan sapi potong disusun atas jerami padi dan konsentrat sebesar 40:60 (% bahan kering). Pengukuran total VFA menggunakan metode destilasi uap, NH_3 metode microdifusi conway, total protozoa metode *sedgewick rafter counting chamber*, sintesis protein mikroba metode zinn dan owens, kadar protein metode bradfold, aktivitas selulase metode somogyi-nelson, aktivitas protease metode walter, aktifitas amilase metode berfield, aktivitas in situ enzim menggunakan metode zymografi laemmli, pengukuran berat molekul enzim menggunakan metode native-page walker.

Suplementasi DFM dan TDW menghasilkan interaksi nyata ($P<0,01$) terhadap total protozoa, kadar NH_3 dan kadar protein dalam cairan rumen, namun tidak nyata ($P>0,05$) terhadap VFA total, SPM, aktivitas selulase, amilase dan protease. Meskipun tidak ditemukan interaksi terhadap VFA total, selulase, amilase dan protease akan tetapi suplementasi DFM berpengaruh sangat nyata ($P<0,01$)menurunkan aktivitas amilase, protease, selulase serta berpengaruh nyata ($P<0,05$) terhadap VFA total. Uji aktivitas enzim menggunakan zymografi ditemukan dua molekul protease berukuran 144 kDa dan 133 kDa serta selulase berukuran 62-67 kDa dan 19-21 kDa penambahan DFM memunculkan protease berukuran 14 dan 25 kDa. **Simpulan** dosis 0,24% TDW dan 0,5% DFM merupakan kombinasi terbaik yang mampu meningkatkan produk metabolik rumen sapi potong.

Kata Kunci : *Hibiscus*, DFM, VFA, NH_3, Protozoa, Zymografi

SUMMARY

This study investigated the response of Hibiscus Leaf Meal (HLM) and Direct-Fed Microbials (DFM) supplementation on VFA and NH_3 levels, total protozoa, microbial protein synthesis (SPM), and cellulase, amylase and protease activities in beef cattle rumen fluid.

Study was conducted experimentally with a factorial pattern using a completely randomized design (CRD). The first factor was three levels of DFM mixed in rice straw, namely P1 = 0, P2 = 0.5, P3 = 1 (% dry matter of rice straw). The second factor was three levels of TDW supplementation in concentrate, namely D1 = 0, D2 = 0.24, D3 = 0.48 (% dry matter concentrate) So that nine treatments were obtained, each treatment was repeated three times. Feed for beef cattle is composed of rice straw and concentrate at 40:60 (% dry matter). Measurement of total VFA using the steam distillation method, NH_3 Conway microdiffusion method, total protozoa using the Sedgewick Rafter counting chamber method, microbial protein synthesis using the Zinn and Owens method, protein content by the Bradfold method, cellulase activity by the Somogyi-Nelson method, protease activity by the Walter method, amylase activity by the Berfield method. in situ enzyme activity using the Laemmli zymography method, measurement of the molecular weight of the enzyme using the native-page walker method.

DFM and TDW supplementation resulted in significant interactions ($P<0.01$) for total protozoa, NH3 and protein levels in the rumen fluid, but no significant interactions ($P>0.05$) were found for total VFA, SPM, and cellulase, amylase and protease activities. Although no interaction was found for total VFA, cellulase, amylase and protease, DFM supplementation had a very significant ($P<0.01$) effect on amylase and protease and a significant effect ($P<0.05$) on total VFA and cellulase activity. Quantitative test of enzyme activity using zymography informed that 0.5% and 1% DFM supplementation gave rise to protease bands of 14 and 25 kDa. **Conclusion**, the dose of 0.24% TDW and 0.5% DFM is the best combination that can increase the rumen fluid metabolic product of beef cattle.

Key words: *Hibiscus*, DFM, VFA, NH_3, Protozoa, Zymogram