

## RINGKASAN

Hijauan berkualitas tinggi merupakan faktor penentu produktivitas ternak ruminansia, namun kelemahan utama hijauan di lapangan adalah kandungan serat kasar yang tinggi dan protein kasar yang rendah. Rumput Pakchong (*Pennisetum purpureum* cv. Thailand) merupakan hijauan unggul dengan produktivitas tinggi yang kualitas nutrisinya masih dapat dioptimalkan melalui pemupukan organik berbasis feses kambing yang diperkaya bioaktivator *Biofad*. Permasalahan yang diangkat dalam penelitian ini adalah belum diketahuinya level optimal bioaktivator *Biofad* dalam pupuk feses kambing untuk meningkatkan kandungan protein kasar dan menurunkan kandungan serat kasar rumput Pakchong. Tujuan penelitian ini adalah mengetahui pengaruh berbagai level bioaktivator *Biofad* dalam pupuk feses kambing terhadap kandungan serat kasar dan protein kasar rumput Pakchong, menentukan level *Biofad* yang paling optimal, serta mengetahui bentuk respons kedua variabel tersebut terhadap perlakuan yang diberikan.

Penelitian dilaksanakan di Lahan Pertanian Universitas Nahdlatul Ulama Purwokerto dan analisis laboratorium dilakukan di Laboratorium Ilmu Nutrisi dan Makanan Ternak, Fakultas Peternakan, Universitas Jenderal Soedirman, pada November 2025 hingga Maret 2026. Rancangan yang digunakan adalah Rancangan Acak Lengkap (RAL) dengan 4 perlakuan dan 5 ulangan. Perlakuan terdiri atas: B0 (pupuk feses kambing tanpa *Biofad*), B1 (*Biofad* 0,025%), B2 (*Biofad* 0,050%), dan B3 (*Biofad* 0,075%). Pupuk didekomposisi selama 45 hari, kemudian diaplikasikan pada rumput Pakchong yang ditanam dalam *polybag* dan dipanen pada hari ke-60. Variabel yang diamati adalah kandungan serat kasar (SK) dan protein kasar (PK). Data dianalisis menggunakan ANOVA, dilanjutkan dengan uji *Duncan's Multiple Range Test* (DMRT) pada taraf 5% dan uji ortogonal polinomial untuk menentukan bentuk respons perlakuan.

Hasil analisis variansi menunjukkan bahwa penambahan berbagai level bioaktivator *Biofad* dalam pupuk feses kambing berpengaruh sangat nyata ( $P < 0,01$ ) terhadap kandungan protein kasar maupun serat kasar rumput Pakchong. Perlakuan B2 menghasilkan kandungan protein kasar tertinggi sebesar 13,01%, sedangkan kandungan serat kasar terendah dihasilkan oleh perlakuan B3 sebesar 32,72%. Perlakuan B1 menghasilkan protein kasar terendah (8,98%) dan serat kasar tertinggi (36,38%), yang mengindikasikan bahwa dosis bioaktivator yang terlalu rendah belum mampu mengakselerasi mineralisasi nitrogen secara optimal. Hasil uji ortogonal polinomial menunjukkan bahwa respons protein kasar dan serat kasar terhadap level *Biofad* mengikuti pola kubik yang sangat nyata ( $P < 0,01$ ) dengan koefisien determinasi masing-masing  $R^2 = 0,9906$  dan  $R^2 = 0,9224$ . Dosis optimum *Biofad* diestimasi pada rentang 0,061%–0,070% dengan proyeksi protein kasar sebesar 13,85% dan serat kasar sebesar 32,59%.

**Kata Kunci:** Pupuk Kandang, Kualitas Nutrisi Hijauan, Analisis Proksimat, Fermentasi, *Pennisetum purpureum*

## SUMMARY

*High-quality forage is a key determinant of ruminant livestock productivity; however, the main drawback of forage in the field is its high crude fiber content and low crude protein content. Pakchong grass (*Pennisetum purpureum* cv. Thailand) is a superior forage with high productivity, whose nutritional quality can still be optimized through organic fertilization based on goat manure enriched with the Biofad bioactivator. The problem addressed in this study is the lack of knowledge regarding the optimal level of Biofad bioactivator in goat manure fertilizer to increase crude protein content and reduce crude fiber content in Pakchong grass. The objectives of this study were to determine the effect of various levels of the Biofad bioactivator in goat manure fertilizer on the crude fiber and crude protein content of Pakchong grass, to determine the most optimal level of Biofad, and to determine the response patterns of these two variables to the treatments applied.*

*The study was conducted at the Agricultural Land of Nahdlatul Ulama University in Purwokerto, and laboratory analyses were performed at the Laboratory of Animal Nutrition and Food Science, Faculty of Animal Science, Jenderal Soedirman University, from November 2025 to March 2026. A completely randomized design (CRD) was used, with 4 treatments and 5 replicates. The treatments consisted of: B0 (goat manure without Biofad), B1 (0.025% Biofad), B2 (0.050% Biofad), and B3 (0.075% Biofad). The fertilizer was decomposed for 45 days, then applied to Pakchong grass grown in polybags and harvested on the 60th day. The observed variables were crude fiber (CF) and crude protein (CP) content. The data were analyzed using ANOVA, followed by Duncan's Multiple Range Test (DMRT) at the 5% level and orthogonal polynomial analysis to determine the treatment response pattern.*

*The results of the analysis of variance showed that the addition of various levels of the Biofad bioactivator to goat manure had a highly significant effect ( $P < 0.01$ ) on the crude protein and crude fiber content of Pakchong grass. Treatment B2 produced the highest crude protein content of 13.01%, while the lowest crude fiber content was produced by treatment B3 at 32.72%. Treatment B1 produced the lowest crude protein (8.98%) and the highest crude fiber (36.38%), indicating that a bioactivator dose that is too low is not capable of optimally accelerating nitrogen mineralization. The results of the orthogonal polynomial test showed that the responses of crude protein and crude fiber to Biofad levels followed a highly significant cubic pattern ( $P < 0.01$ ) with determination coefficients of  $R^2 = 0.9906$  and  $R^2 = 0.9224$ , respectively. The optimal Biofad dose was estimated to be in the range of 0.061%–0.070%, with projected crude protein of 13.85% and crude fiber of 32.59%.*

**Keywords:** *Organic Manure, Forage Nutritive Value, Proximate Analysis, Fermentation, *Pennisetum purpureum**