

POLXMERXSASX UREA-ASETALDEHID UNTUK MENGHASILKAN UREA
SLOW RELEASE SEBAGAI SUMBER NITROGEN
BAGI TERNAK RUMINANSIA

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Intisari

Urea merupakan salah satu sumber *non protein nitrogen* (NPN) bagi ternak ruminansia. Urea mudah terurai dalam rumen dan mikrobia mendegradasi menjadi amonia serta karbondioksida. Penelitian ini bertujuan untuk membuat *urea slow release* melalui polimerisasi urea-asetaldehid, mengetahui kelarutannya dalam larutan dengan pH dan waktu yang berbeda serta degradasi *in sacco* di rumen. Dilakukan uji kelarutan *urea slow release* tablet dengan periode waktu 0,25, 0,5, 0,75, 1, dan 1,5 jam pada larutan dengan pH 5, 6 dan 7. Rancangan percobaan yang digunakan adalah Rancangan Acak Lengkap, terbagi oleh waktu (*plot time*). Data yang diperoleh, dilakukan analisis variansi dan dilanjutkan dengan uji jarak ganda Duncan. *Urea slow release* tablet dianalisis *in sacco* dengan waktu inkubasi 0,25, 0,5, 0,75, 1, 1,5, 2, 4, 8, 16, 24, dan 48 jam. Model eksponensial Orskov dan Me Donald (1979) digunakan untuk menghitung degradasi teori bahan kering dan nitrogennya. Hasil penelitian menunjukkan bahwa *urea slow release* tablet hasil polimerisasi urea-asetaldehid mengandung 33,660% nitrogen dan 7,540% air. Persentase terlarut *urea slow release* tablet terendah di dalam larutan adalah 20,612 dan tertinggi adalah 44,797. Hasil analisis variansi persentase terlarut *urea slow release* tablet pada pH dan waktu menunjukkan perbedaan yang nyata ($P < 0,05$) serta terdapat interaksi antara pH dan waktu. Degradasi teori (DT) bahan kering dan nitrogen *urea slow release* tablet masing-masing sebesar 87,003% dan 81,995%. Polimerisasi urea-asetaldehid dapat menurunkan kelarutan urea di dalam air dan cairan rumen.

(Kata Kunci : Ruminansia, Non Protein Nitrogen, Urea, *Urea Slow Release*, Polimerisasi, Kelarutan)

POLYMERIZE of UREA-ASETALDEHID TO PRODUCE UREA SLOW
RELEASE AS SOURCE OF NITROGEN
FOR RUMINANTS

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Abstract

Urea is used as a source of non protein nitrogen (NPN) in feed supplements. Urea is highly soluble in the rumen and microorganisms rapidly decompose it to ammonia and carbon dioxide. The aims of this research were to produce urea slow release from chemical reaction between urea and asetaldehyd through polymerize process, to know it's dissolution in solution with different pH and time also in sacco degradation in the rumen. The dissolution tests were done with periode of time (hours) 0.25, 0.5, 0.75, 1, and 1.5 in the solution with pH 5, 6 and 7. Experimental laboratory was used in this research. Experimental design used is split by time (plot time). Obtained data were analysed by analysis of variance (ANOVA) and continued by Duncan's multiple range test (DMRT). The in sacco degradation test was done with incubation time (hours) 0.25, 0.5, 0.75, 1, 1.5, 2, 4, 8, 16, 24, and 48. The exponential model (Ørskov and Me Donald, 1979) was used to calculate the dry matter and nitrogen (N) degradability. The result indicated that urea slow release tablet contained 33.660% nitrogen and 7.540% moisture. The variance analysis in dissolution percentage indicated that there were significant different ($P < 0.05$) in time and pH, also there was interaction between time and pH. Theoretical degradability of dry matter was 87.003% and for nitrogen was 81.995%. Through Polymerize process between urea and asetaldehyd, decreased urea dissolution and degradation in rumen.

(Key words : Ruminants, Non Protein Nitrogen, Urea, Urea Slow Release, Polymerize, Dissolution)