PREDIKSI UMUR PUBERTAS DAN LAJU PERTUMBUHAN DOMBA EKOR GEMUK DI PT. HRL INTERNASIONAL DENGAN MODEL MATEMATIK *NON LINEAR*

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INTISARI

Domba Ekor Gemuk (DEG) merupakan salahsatu plasma nutfah di Indonesia yang banyak berkembang di JawaTimurdan Wilayah Indonesia Timur.Seleksi dilakukan sebagai upaya mempertahankan plasma nutfah. Kriteria seleksi yang digunakan adalah umur pubertas dan bobot badan ternak. Kriteria tersebut dapat diprediksi menggunakan model matematik *non linear*. Model matematik *non linear* lebih baik dalam menggambarkan kondisi bioligikal dibandingkan dengan model *linear*. Penelitian ini bertujuan memprediksi umur pubertas dan laju pertumbuhan 200 ekor DEG di PT HRL Internasional meggunakan lima model matematik *non linear* meliputi model Brody, Von Bertalanffy, Logistic, Gompertz, dan Ricards. Metode pengambilan data menggunakan recording ternak dengan tipe data *Cross Sectional*. Prediksi umur pubertas dan laju pertumbuhan Domba Ekor Gemuk dianalisis menggunakan lima model *non linear* dengan program SPSS. Hasil penelitian memperlihatkan Gompertz memiliki koefisien determinasi ($R^2>70\%$) diikuti model Richards, Bertalanffy, Logistic dan Brody. Model Gompertz adalah model paling fit untuk memprediksi umur pubertas (7,8 bulan). Laju pertumbuhan sebelum dan saat pubertas mengikuti model Logistic. Model terbaik untuk prediksi umur pubertas dan laju pertumbuhan Domba Ekor Gemuk di PT HRL Internasional adalah model Gompertz dan Logistic.

Kata Kunci: Umur Pubertas, Pertumbuhan, Domba Ekor Gemuk, Model Matematik *Non Linear*

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PREDICTION OF THE AGE ON PUBERTY AND GROWTH RATE OF FAT TAILED SHEEP AT PT HRL INTERNATIONAL WITH NON LINEAR MATHEMATICAL MODEL

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ABSTRACT

Fat tailed sheep (FTS) is one of Indonesian indigenous sheep arise commonly in East Java and Eastern part of Indonesia. Selection is one of methods to conserve the sheep. The age on puberty and growth rate are widely used as selection criteria. Those criteria can be predicted using non linear mathematic model. Non linear mathematical models are superior in describing biological processes compared to linear models. Therefore, the aim of study was to predict the age on puberty and growth rate in 200 FTS population arise in PT HRL International using 5 (five) non linear mathematic models: Brody, Von Bertalanffy, Logistic, Gompertz and Richards. The cross sectional data was used to collect the data from the age of birth to mature. The data were analyzed by the five models using SPSS program to predict the age on puberty and the growth rate. The results showed Gompertz model indicated having highest determination coefficient (R^2=70%) followed by Richards, Bertalanffy, Logistic and Brody. The Gompertz model was the most fit to predict the age on puberty (7.8 month). However, the prediction of weight on puberty (7.88 kg) fitted with Bertalanffy model. The growth rate on puberty followed Logistic model. In conclusion. The best model to predict the age on puberty and the growth rate of FTS in PT HRL International is Gompertz and Logistic.

Keyword: The Age of Puberty, Growth, Fat Tailed Sheep, Non Linear Mathematical Model