

## ABSTRAK

Fitase merupakan salah satu enzim yang tergolong dalam kelompok phosphatase yang mampu menghidrolisis senyawa fitat berupa myo-inositol (1,2,3,4,5,6) hexsa phosphatase menjadi myo-inositol dan phosphat organik. Salah satu alternatif untuk menurunkan kandungan fitat dalam pakan adalah dengan menggunakan bakteri penghasil enzim fitase. Tim Peneliti telah berhasil memperoleh bakteri asal rumen ruminansia (*Actinobacillus sp* dan *Bacillus pumilus*) yang diharapkan mampu menghasilkan enzim fitase sebagai *Feed Supplement* untuk menghasilkan bahan pakan ternak berkualitas ditinjau dari ketersediaan protein dan mineral P, Mg, Mn, Fe, Zn, Ca yang tinggi sehingga selain dapat memenuhi kebutuhan nutrisi bagi ayam broiler juga ramah lingkungan.

Tujuan penelitian ini adalah untuk mendapatkan karakterisasi enzim fitase produksi bakteri *Actinobacillus sp* dan *Bacillus pumilus* (kurva pertumbuhan bakteri, optimasi pH dan suhu, stabilitas pH dan suhu).

Metode Penelitian Tahap I (Tahun I) adalah pengamatan terhadap kurva pertumbuhan bakteri *Actinobacillus sp* dan *Bacillus pumilus*, uji aktivitas enzim, karakterisasi enzim fitase pada berbagai suhu maupun pH serta stabilitas enzim.

Hasil optimasi fitase dari bakteri *Actinobacillus sp* diperoleh pada suhu 45 °C dengan aktivitas 0,1374 U/mL, optimasi pH 4 dengan aktivitas 0,1374 U/mL. Stabilitas suhu enzim fitase dari bakteri *Actinobacillus sp* cukup baik dimana enzim ini stabil pada suhu 45 °C selama 2-4 jam (0,0428-0,0657 U/mL). Stabilitas pH enzim fitase dari bakteri *Actinobacillus sp* cukup baik dimana enzim ini stabil pada pH 4 (0,0353 U/mL).

Hasil penelitian optimasi fitase dari bakteri *Bacillus pumilus* diperoleh pada suhu 50 °C dengan aktivitas 0,0780 U/mL, optimasi pH 6 dengan aktivitas 0,0577 U/mL. Stabilitas suhu enzim fitase dari bakteri *Bacillus pumilus* cukup baik dimana enzim ini stabil pada suhu 50 °C selama 2-10 jam (0,0592-0,0593 U/mL). Stabilitas pH enzim fitase dari bakteri *Bacillus pumilus* cukup baik dimana enzim ini stabil pada pH 4-6 (0,0216-0,0351 U/mL). Disimpulkan enzim fitase bakteri *Actinobacillus sp* mempunyai prosentase pH dan suhu optimum masing-masing 4 dan 45° C, stabil pada suhu 45° C selama 6 jam dengan rentang pH 4 – 6. Enzim fitase bakteri *Bacillus pumilus* mempunyai prosentase pH dan suhu optimum masing-masing 6 dan 50° C, stabil pada suhu 50° C selama 10 jam dengan rentang pH 4 – 6.

**Key words :** fitase, karakterisasi, *Actinobacillus sp* , *Bacillus pumilus*

## ABSTRACT

Phytase is one of the enzymes belonging to the phosphatase that can hydrolyze phytic compounds such as myo-inositol (1,2,3,4,5,6) hexsa into myo-inositol phosphatase and organic phosphate. One alternative to reduce the phytate content of the feed is to use the enzyme phytase-producing bacteria. Considering the importance of metals and proteins bound to the phytate compound growth will require alternative broiler feed efficiency by solving the optimization of phytate compounds. Ruminant origin rumen bacteria (*Actinobacillus* sp and *Bacillus pumilus*) is expected to produce the enzyme phytase as a Feed Supplement for producing animal feed quality in terms of the availability of protein and minerals, P, Mg, Mn, Fe, Zn, Ca were high that in addition to meeting the needs of nutrients for broiler chickens are also environmentally friendly.

The objective this research is to obtain the characterization of enzyme phytase production of bacteria *Actinobacillus* sp and *Bacillus pumilus* (bacterial growth curve, optimization of pH and temperature, pH and temperature stability).. Research Methods Phase I (First Year ) is the observation of the growth curve of bacteria *Actinobacillus* sp and *Bacillus pumilus*, enzyme activity assays, characterization of enzyme phytase at different temperatures and pH as well as the stability of the enzyme.

The result showed phytase optimization results obtained from the bacterium *Actinobacillus* sp at 45 °C with activity 0.1374 U / mL, pH 4 with activity optimization 0.1374 U / mL. Temperature stability of the phytase enzyme bacteria *Actinobacillus* sp still good where the enzyme is stable at 45 °C for 2-4 hours (from 0,0428-0,0657 U / mL). The results obtained by the optimization phytase from *Bacillus pumilus* obtained at 50 °C with the activity of 0.0780 U / mL, pH 6 with activity optimization 0.0577 U / mL. Temperature stability of the phytase enzyme bacteria *Bacillus pumilus* still good where the enzyme is stable at 50 °C for 2-10 hours (0.0592 to 0.0593 U / mL). pH stability of the enzyme phytase bacteria *Bacillus pumilus* still good where the enzyme is stable at pH 4-6 (0.0216 to 0.0351 U / mL). Concluded *Actinobacillus* sp bacterial phytase enzyme has a pH and temperature optimum percent respectively 4 and 45 °C, is stable at a temperature of 45° C for 6 hours with a pH range of 4-6. *Bacillus pumilus* phytase enzyme has a pH and temperature optimum percentage of each 6 and 50 °C, is stable at a temperature of 50°C for 10 hours with a pH range 4-6.

**Key words :** phytase, characterization, *Actinobacillus* sp , *Bacillus pumilus*