

## ABSTRAK

### **PENAMBAHAN PROBIOTIK PADA PAKAN BERBASIS *DISTILLERS DRIED GRAIN WITH SOLUBLES* (DDGS) UNTUK MENINGKATKAN RESPON IMUN NON SPESIFIK IKAN GABUS (*Channa striata*) YANG DIINFEKSI *Aeromonas hydrophila***

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Bahan baku dalam pembuatan pakan yang umumnya masih menggunakan tepung ikan dapat disubstitusikan dengan tepung *distillers dried grains with solubles* (DDGS). Penambahan probiotik yang mengandung *Bacillus subtilis* dalam pakan dapat meningkatkan respon imun ikan. Tujuan dari penelitian ini untuk mengevaluasi penambahan probiotik pada pakan berbasis *distillers dried grain with solubles* (DDGS) untuk meningkatkan respon imun non spesifik ikan gabus (*Channa striata*) yang diinfeksi *Aeromonas hydrophila*. Penelitian ini menggunakan rancangan acak lengkap (RAL) dengan 4 perlakuan dan masing-masing 3 ulangan: P1 kontrol (pakan DDGS tanpa probiotik), P2 (penambahan probiotik 15 ml/kg pakan), P3 (penambahan probiotik 30 ml/kg pakan), dan P4 (penambahan probiotik 45 ml/kg pakan). Ikan uji yang digunakan memiliki rerata awal panjang  $18,10 \pm 0,93$  cm dan berat  $49,20 \pm 7,83$  g. Ikan sebanyak 6 ekor dilakukan sampling sebelum dan setelah infeksi bakteri *Aeromonas hydrophila* dengan kepadatan  $10^7$  CFU/ml, sampling dilakukan pada H+1, H+4, dan H+7 setelah infeksi untuk dianalisis kesehatannya. Variabel penelitian yang diamati yaitu kadar hematokrit, total leukosit, total eritrosit, aktivitas fagositosis, indeks fagositosis, tingkat kelangsungan hidup, *relative percent survival*, dan gejala klinis. Hasil penelitian ini menunjukkan bahwa pakan berbasis DDGS dengan penambahan probiotik 30ml/kg pakan memiliki pengaruh nyata terhadap total leukosit, total eritrosit, aktivitas fagositosis dan tingkat kelangsungan hidup ikan gabus pasca infeksi bakteri *Aeromonas hydrophila*, tetapi tidak berbeda nyata dengan kadar hematokrit, indeks fagositosis, dan *relative percent survival* (RPS). Penelitian ini membuktikan bahwa pakan berbasis tepung *distillers dried grains with solubles* (DDGS) dapat meningkatkan kesehatan ikan gabus (*Channa striata*).

Kata kunci : *Aeromonas hydrophila*, *Bacillus subtilis*, DDGS, Ikan gabus.

## ABSTRACT

### **PROBIOTIC SUPPLEMENTATION IN *DISTILLERS DRIED GRAIN WITH SOLUBLES* (DDGS) BASED DIET IMPROVES NON-SPECIFIC IMMUNITY OF SNAKEHEAD (*Channa striata*) CHALLENGED WITH *Aeromonas hydrophila***

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Fish meal is commonly used as the main protein source in aquafeeds. however, its availability and cost have encouraged the exploration of alternative ingredients such as distillers dried grains with solubles (DDGS). In addition, dietary probiotics containing *Bacillus subtilis* have been reported to enhance fish immune responses. This study aimed to evaluate the effect of probiotic supplementation in DDGS-based diets on the non-specific immune response of snakehead fish (*Channa striata*) challenged with *Aeromonas hydrophila*. The experiment employed a completely randomized design with four treatments and three replications: P1 (control diet without probiotics), P2 (15 ml/kg probiotic supplementation), P3 (30 ml/kg), and P4 (45 ml/kg). Experimental fish had an initial average length of  $18.10 \pm 0.93$  cm and body weight of  $49.20 \pm 7.83$  g. Fish were experimentally infected with *A. hydrophila* at a density of  $10^7$  CFU/ml. Sampling was conducted before infection and on days 1, 4, and 7 post-infection to evaluate health parameters. Observed variables included hematocrit value, total leukocyte count, total erythrocyte count, phagocytic activity, phagocytic index, survival rate, relative percent survival (RPS), and clinical symptoms. The results demonstrated that DDGS-based diets supplemented with probiotics at a dose of 30 ml/kg significantly increased total leukocyte count, total erythrocyte count, phagocytic activity, and survival rate of snakehead fish after bacterial infection. However, no significant differences were observed in hematocrit value, phagocytic index, and RPS. In conclusion, DDGS based diets supplemented with probiotics are effective in improving the health and immune response of snakehead fish (*Channa striata*).

Keywords: *Aeromonas hydrophila*, *Bacillus subtilis*, DDGS, Snakehead fish.