

## **PENGGUNAAN SINBIOTIK YANG BERBASIS ISOLAT CAMPURAN DAN WHEAT POLLARD DALAM RANSUM UNTUK MENINGKATKAN PRODUKTIVITAS AYAM KAMPUNG**

### **INTISARI**

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Penelitian bertujuan untuk mengidentifikasi mikroorganisme yang berpotensi sebagai probiotik dari jus kubis afkir terfermentasi, mengkaji kemampuan hidup bakteri probiotik dari jus kubis afkir terfermentasi pada pH rendah dan garam empedu, mengkaji ketahanan bakteri probiotik dari jus kubis afkir terfermentasi terhadap bakteri *Escherichia coli* dan *Salmonella pullorum*, mengkaji pengaruh lama pemanasan dengan *autoclave* terhadap komposisi kimia *wheat pollard* sampai menjadi monomer-monomer yang berpotensi sebagai prebiotik, mengkaji penambahan jus kubis afkir terfermentasi dan lama fermentasi pada *wheat pollard* terolah yang berpotensi sebagai sinbiotik dan mengkaji efektivitas ransum berbasis *wheat pollard* sinbiotik dalam upaya meningkatkan kualitas dan utilitas *wheat pollard* sinbiotik sebagai pakan ayam kampung. Penelitian terbagi atas empat tahap. Tahap pertama yaitu isolasi, identifikasi, uji probiotik dan uji kemampuan mendegradasi selulosa mikroorganisme asal jus kubis afkir terfermentasi. Penelitian tahap kedua adalah pengolahan *wheat pollard* sebagai prebiotik yang dilakukan secara fisik dengan menggunakan *autoclave*. Penelitian tahap ke tiga adalah pengolahan *wheat pollard* sebagai sinbiotik yang dilakukan dengan fermentasi menggunakan jus kubis afkir terfermentasi. Penelitian tahap ke empat adalah penggunaan ransum sinbiotik berbasis *wheat pollard* untuk meningkatkan produktivitas ayam kampung. Parameter yang diamati pada tahap 1 yaitu isolasi bakteri asam laktat, identifikasi bakteri asam laktat, pengujian kemampuan probiotik meliputi uji ketahanan terhadap garam empedu, ketahanan terhadap pH, sensitifitas menghambat *Escherichia coli* dan *Salmonella pullorum*, uji kemampuan mendegradasi selulosa serta isolasi dan identifikasi kapang dan khamir. Parameter pada penelitian tahap 2 dan 3 adalah komposisi kimia (proksimat), komponen serat (ADF, NDF, selulosa, hemiselulosa dan lignin), gross energi, komponen monosakarida (glukosa, sukrosa, manosa dan arabinosa), komponen oligosakarida (rafinosa), amilum, amilosa, amilopektin dan *resisten starch* serta profil serat *wheat pollard* melalui analisis *scanning electron microscope* (SEM). Parameter yang diamati pada tahap 4 adalah konsumsi ransum, bobot badan akhir, FCR, pertambahan bobot badan, retensi nitrogen, profil serat ransum berbasis *wheat pollard* sinbiotik melalui analisis *scanning electron microscope* (SEM), *income over feed chick cost* (IOFCC) dan profil vili usus. Tahap 1 menggunakan analisis deskriptif sedangkan tahap 2 dan 4 menggunakan rancangan acak lengkap pola searah dan pada tahap 3 menggunakan rancangan acak lengkap pola faktorial 3x3 dengan 3 ulangan. Hasil penelitian tahap 1 diperoleh 4 jenis mikroorganisme sebagai probiotik yaitu *Lactobacillus brevis*, *Lactobacillus plantarum*, *Rhizopus oryzae* dan *Saccharomyces cerevise*. Penelitian tahap 2 memperlihatkan peningkatan yang

signifikan pada parameter kadar abu, protein kasar, serat kasar, bahan ekstrak tanpa nitrogen (BETN), lignin, gross energi, glukosa, arabinosa, amilum, amilopektin dan *resisten starch* ( $P < 0,05$ ) sedangkan pada kadar air, NDF, hemiselulosa, selulosa, sukrosa, rafinosa dan amilosa mengalami penurunan yang signifikan ( $P < 0,05$ ). Penelitian tahap 3 memperlihatkan peningkatan yang signifikan pada kadar abu, protein kasar, serat kasar ( $P < 0,05$ ) sedangkan pada parameter BETN, ADF, NDF, hemiselulosa, lignin, gross energi, sukrosa, mannanosa, arabinosa, rafinosa, amilosa, amilum, amilopektin dan *resisten starch* terdapat interaksi antar kedua faktor ( $P < 0,05$ ) namun, pada parameter glukosa tidak terdapat interaksi antar kedua faktor. Penelitian tahap 4 memperlihatkan peningkatan pada parameter bobot badan akhir, pertambahan bobot badan, retensi nitrogen, IOFCC dan profil vili usus halus (duodenum, jejunum, ileum) ( $P < 0,05$ ). Hasil penelitian terbaik pada tahap 2 terdapat pada perlakuan lama pemanasan 15 menit, penelitian tahap 3 pada perlakuan penambahan 40% jus kubis afkir terfermentasi dengan lama peram 4 hari dan tahap 4 pada perlakuan penambahan *wheat pollard* sinbiotik sebanyak 40%. Kesimpulan penelitian adalah proses pengolahan *wheat pollard* menjadi prebiotik didapatkan pada pemanasan selama 15 menit. Sinbiotik dari *wheat pollard* dan jus kubis afkir terfermentasi didapatkan pada penambahan 40% jus kubis afkir terfermentasi dengan lama pemeraman 4 hari. Ransum terbaik yang digunakan untuk meningkatkan produktivitas ayam kampung adalah penambahan *wheat pollard* sinbiotik sebanyak 40% dalam komposisi ransum.

Kata kunci: Ayam kampung, Komponen kimia, Prebiotik, Sinbiotik, *Wheat pollard*

## UTILIZATION OF SYNBIOTIC BASED ON MIXED ISOLATE AND WHEAT POLLARD IN DIETS FOR IMPROVING PRODUCTIVITY OF NATIVE CHICKEN

### ABSTRACT

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The aims of this study was to identify probiotic potential of microbes which isolated from fermented rejected cabbage juice, to assess probiotics survivability on low pH and bile salts presence, to assess probiotics resistance against *Escherichia coli* and *Salmonella pullorum* bacteria, to study the effect of prolonged heating by autoclave on wheat pollard chemical composition as potential prebiotic monomers, to examine the addition of fermented rejected cabbage juice and fermentation duration on treated potentially-synbiotic wheat pollard, and to assess wheat pollard based synbiotic addition in native chicken rations in order to improve quality and utility of wheat pollard synbiotic. This study was divided into four phases. The first phase were microbes isolation from fermented rejected cabbage juice followed by microorganism identification, probiotic test and cellulose degradation test. The second phase was wheat pollard processing as prebiotic which was done physically by using autoclave. The third phase was wheat pollard processing as synbiotic which was done by fermentation using fermented rejected cabbage juice as starter. The fourth phase was wheat pollard-based synbiotic rations incorporation to increase the native chicken productivity. In the first phase, descriptive analysis was used. In the 2 and 4 phase complete randomized design with direct pattern was used and in the third phase complete randomized design of 3x3 factorial pattern with 3 replications was used. Observation parameters in the first phase were lactic acid bacteria isolation and identification, probiotic survivability including bile salt resistance, pH resistance, inhibition ability of *Escherichia coli* and *Salmonella pullorum*, cellulose degradation ability test, and mold and yeast isolation and identification. Observation parameters in the 2 and 3 phase were chemical composition (proximate), fiber component (acid detergent fiber (ADF), neutral detergent fiber (NDF), cellulose, hemicellulose and lignin), gross energy, monosaccharide components (glucose, sucrose, mannose and arabinose), oligosaccharide (rafinose), amylose, amylopectin, resistant starch and wheat pollard fiber profile identification using scanning electron microscope (SEM) analysis. Parameters observed at phase four were feed intake, final body weight, feed conversion rations (FCR), body weight gain, nitrogen retention, income over feed chick cost (IOFCC) and intestines vili profile. Four types of probiotic microbes was isolated in the first phase which are *Lactobacillus brevis*, *Lactobacillus plantarum*, *Rhizopus oryzae* and *Saccharomyces cerevise*. Second phase of research showed a significant increase in ash content, crude protein, crude fiber, extract material without nitrogen (BETN), lignin, gross energy, glucose, arabinose, starch, amylopectin and starch resistance ( $P < 0.05$ ) while in parameters water content, NDF, hemicellulose, cellulose, sucrose, raffinose and amylose decreased significantly ( $P < 0.05$ ).

Third phase of research showed an increase in ash content, crude protein, crude fiber ( $P<0.05$ ) while in the BETN, ADF, NDF, hemicellulose, lignin, gross energy, sucrose, mannose, arabinose, raffinose, amylose, starch, amylopectin and Starch resistance had interactions between the two factors ( $P<0.05$ ) but there were no interaction on the glucose parameters. Stage 4 research showed an increase in the parameters of final body weight, body weight gain, nitrogen retention, IOFCC and small intestinal villous profile as shown on the duodenum, jejunum and ileum ( $P<0.05$ ). The best result in second phase was found for 15 minute of heating time. In the third phase the best result was found with addition of 40% fermented rejected cabbage juice with 4 days fermentation duration and in the phase 4 best result was found with addition of 40% white pollard synbiotic. It can be concluded that the best processing method to make prebiotics from white pollard was with 15 minutes of heating. The best synbiotic obtained from wheat pollard and fermented rejected cabbage juice with the addition of 40% fermented rejected cabbage juice and 4 days of fermentation. The highest native chicken productivity was obtained with addition of 40% synbiotic in the ration.

Keywords: Native chicken, Probiotik, Prebiotic, Synbiotic, Wheat pollard