Tropentag, September 16-18, 2026, hybrid conference

"Towards multi-functional agro-ecosystems
promoting climate resilient futures"

Choice feeding of fermented de-oiled rice bran in broilers: Impacts on growth, physiology, metabolism, and meat quality

Khan Md Shaiful Islam[1], Syful Islam[2], Khadija Khatun[3], Rakhi Chowdhury[4], Jesmin Aktar[5], Md. Aliar Rahman[6], Jürgen Zentek[7], Khan Md. Shaiful Islam[8]

[1]*BANGLADESH AGRICULTURAL UNIVERSITY, Department of Animal Nutrition,*
[2]*BANGLADESH AGRICULTURAL UNIVERSITY, Department of Animal Nutrition,*
[3]*BANGLADESH AGRICULTURAL UNIVERSITY, Department of Animal Nutrition ,*
[4]*BANGLADESH AGRICULTURAL UNIVERSITY, Bangladesh*
[5]*BANGLADESH AGRICULTURAL UNIVERSITY, Department of Animal Nutrition, Bangladesh*
[6]*BANGLADESH AGRICULTURAL UNIVERSITY, Bangladesh*
[7]*Freie Universität Berlin, Inst. of Animal Nutrition, Germany*
[8]*BANGLADESH AGRICULTURAL UNIVERSITY, Department of Animal Nutrition, Bangladesh*

Abstract

This research focuses on how fermentation affects the nutrient content of de-oiled rice bran (DORB) and their suitability as an additional food source for broilers in a free-choice feeding system, particularly identifying the best fermentation period. DORB was fermented in anaerobic conditions with 2 % yeast at a temperature of 29 to 33 °C and 60 % moisture. After fermentation, the fermented DORB was dried and made into pellets. The experiment involved 192 Arbor Acres broiler chicks over 35 days. These chicks were split into four groups of 48 birds each, with 6 replication and 8 birds per replicate: (1) a standard diet (control), (2) a standard diet mixed with unfermented DORB (which included yeast), (3) a standard diet with DORB fermented for 24 hours, and (4) a standard diet with DORB fermented for 48 hours. The chicks had free access to the diet and DORB, along with unlimited food and water. Fermentation greatly improved the quality of DORB. Crude protein rose from 18.2 % to 24.5 %, while crude fiber dropped from 19.0 % to 15.2 % ($p < 0.001$). Metabolizable energy increased with longer fermentation times, reaching a peak at 48 hours (2838 kcal/kg), followed by 24 hours (2610 kcal/kg), in contrast to unfermented DORB (2465–2492 kcal/kg) ($p < 0.001$). Total amino acids improved from 10.46 to between 11.20 and 11.68 g/100 g, with increases in essential amino acids such as leucine, lysine, and isoleucine ($p < 0.001$). Growth performance was similar across all treatments (final body weight: 2196–2336 g; FCR: 1.50–1.55; $p > 0.05$), although groups with fermented DORB had slightly higher gains. Feed intake of fermented DORB peaked at 24 hours. Meat ether extract significantly decreased from 3.33 % in the control group to 1.36 % at 48 hours, while carcass yield remained stable at 64–67 %. Serum analysis showed improved health, including lower cholesterol (notably in the 24-hour group), reduced ALT at 48 hours, and stable mineral levels. In summary, fermentation improved the nutritional value of DORB and confirmed its safety for use in broiler diets. A fermentation time of 24 to 48 hours proved optimal, with 24 hours offering slight benefits in performance and feed use.

Contact Address: Khan Md. Shaiful Islam, BANGLADESH AGRICULTURAL UNIVERSITY, Department of Animal Nutrition, Bau main road, 2202 Mymensingh, Bangladesh, e-mail: kmsislam@bau.edu.bd

Keywords: Broiler chickens, de-oiled rice bran, Free-choice feeding, Growth performance, Meat quality