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OPEN ACCESS Pakistan Journal of Nutrition ISSN 1680-5194 DOI: 10.3923/pjn.2017.538.543 Research Article Role of Humic Acid in Improving the Nutrient Content and Quality of Fermented Palm Oil Sludge Mirnawati, Ade Djulardi and Gita Ciptaan Department of Animal Feed and Nutrition, Faculty of Animal Science, Andalas University, 25163 Padang, Indonesia Abstract Objective: An experiment was conducted to understand the effects of different microbes and doses of humic acid on the quality and nutrient content of Fermented Palm Oil Sludge (FPOS). Materials and Methods: The experiment was conducted using a 2 ×3 factorial Completely Randomized Design (CRD) with 3 replications. The first factor was two species of microbe, Neurospora sitophila and Neurospora crassa and the second was different doses of humic acid: (1) 100 ppm, (2) 200 ppm and (3) 300 ppm. The study parameters were the crude protein content, crude fiber content, nitrogen retention and digestible crude fiber content of FPOS. Results: The study parameters were more significantly affected by the interaction between the type of microbe and the dose of humic acid ($p<0.01$) than the humic acid dose alone. FPOS treated with Neurospora crassa and humic acid at 200 ppm showed better values for crude protein (23.74%), crude fiber (20.14%), crude lipid (2.70%), nitrogen retention (60.97%) and digestible crude fiber (55.63%) compared to FPOS treated with Neurospora sitophila. Conclusion: It is concluded that POS fermented with Neurospora crassa and 200 ppm humic acid provides the best food content and quality of FPOS. Key words: Fermentation, microbes, humic acid, palm oil sludge, quality, nutrient Received: November 22, 2016 Accepted: May 10, 2017 Published: June 15, 2017 Citation: Mirnawati, Ade Djulardi and Gita Ciptaan, 2017. Role of humic acid in improving the nutrient content and quality of fermented palm oil sludge. Pak. J. Nutr., 16: 538-543. Corresponding Author: Mirnawati, Department of Animal Feed and Nutrition, Faculty of Animal Science, Andalas University, 25163 Padang, Indonesia Copyright: © 2017 Mirnawati et al. This is an open access article distributed under the terms of the creative commons attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are credited. Competing Interest: The authors have declared that no competing interest exists. Data Availability: All relevant data are within the paper and its supporting information files. INTRODUCTION Indonesia is the largest producer of palm oil in the world and 70% of the oil produced in this country comes from the island of Sumatra. Globally, the province of West Sumatra is the fourth largest palm oil-producing region, with a total annual production of 30,948,931 t of crude palm oil1. The continued development of palm plantations produce high amounts of waste in the form of Palm Oil Sludge (POS), which accounts for as much as 2% of the total production2. However, POS can potentially be used as feed material, especially for poultry. Palm oil sludge is similar to bran in its nutrient content, but it has more fibrous material and a lower availability of amino acids, which is a limiting factor in the production of poultry and other monogastric animals3. The nutritional content of POS is as follows: 11.1% crude protein, 17% crude fiber, 12% crude lipid, 50.4% nitrogen-free extracts, 48.04 ppm Cu and 61.10 ppm Zn4. Even with its fairly high crude protein content, the use of POS in poultry rations is still limited; it can only make up 5% of broiler rations2. To be used in poultry rations, POS must be pre -processed because of its low quality2, including its high fiber and low amino acid contents3,5 and the lack of fiber-digesting enzymes in the poultry digestive system. Another disadvantage of POS is its high crude lipid content, which is a limiting factor in poultry rations. Therefore, to improve its quality, POS must be pre-processed via biotechnological fermentation with cellulolytic and lipolytic fungi3,4, which can decrease the contents of crude fiber and crude lipids and increase the availability of amino acids so that the POS can ultimately replace soybean meal in poultry rations. The cellulolytic and lipolytic fungi that can be used to pre-process FPOS are Neurospora crassa and Neurospora sitophila, which also have carotenolytic properties and