ISSN:

Insights in Aquaculture and Biotechnology: Open Access

DESIGN AND FABRICATION OF A THREE PHASE POULTRY BIRD DE-FEATHERING MACHINE

AdenigbaAdemolaAdebukola

Department of Agronomy, Agricultural and Bio-Environmental Engineering,Nigeria

ABSTRACT

A poultry bird defeathering machine was designed and fabricated in the department of Agricultural and Bio-Environmental Engineering, Federal Polytechnic Ilaro. The machine consisted of a feather plate on which rubber pluckers were arranged, a defeathering chamber on which rubber pluckers were set in an array and was powered with a 1.5kW electric motor. A single phase (defeathering chamber) of the machine was tested at three operating speeds of 200, 280 and 360 rpm, which were obtained by using belt, pulley and a variable resistor system. In order to evaluate the effect of rotor speed and scalding temperature on feather retention, plucking efficiency, and the defeathering time of each bird, Isa brown chickens which were old layers (spent hens) were tested in the machine at five scalding temperatures (room temperature, 30, 50, 70 and 100°C). Data obtained were recorded and presented in tables and graphs. Results showed that feather retention rate and defeathering time decreased with increased operating speed, while plucking efficiency increased with speed.

However, an ANOVA test on the collated data resulted in 0.72, 0.72 and 0.32 for feather retention, plucking efficiency and defeathering time respectively. This result indicated that the effect of defeathering speeds were insignificant. Nonetheless, the scalding temperature had significant effect on the evaluation parameters as feather retention and defeathering time was seen to decrease with increase in scalding temperature. The plucking efficiency increased with increase in scalding temperature up till 700C and reduces afterwards. The highest plucking efficiency of 98.5% was obtained at 360 rpm rotor speed and 100°C scalding temperature. Based on physical evaluation and the results obtained speeds of 280 rpm or higher were recommended to operate the machine and the scalding temperature of 70°C is recommended.

Publication of speakers

i). Akintade, J.O. and Adenigba, A. A. (2018), Development and Evaluation of a Power Weeder. In:International Journal of Innovative Research and Development

(ii) Adenigba, A. A. and Olalusi, A. P. (2019); Development and Evaluation of a Fish Feed Mixer. Agric Engineering international: CIGR Journal

Biography

– He studied Agricultural Engineering at the Federal University of Technology Akure, where he obtained Bachelor of Engineering (B.Eng.) and Masters of Engineering (M.Eng.) in the year 2011 and 2018 respectively.

He currently works in the department of Agricultural and Bio-Environmental Engineering,The Federal Polytechnic Ilaro, Ogun State, Nigeria. He is a well experienced teacher and a seasoned educationist whose style oflecture delivery inspires thestudents to function at the peak of their ability. He is an associate member of the American Society ofAgricultural and BiologicalEngineers (ASABE) and also a member of the InternationalAssociation ofEngineers (IAENG).

International Conference on Agriculture sciences and farming technology, August 26-27,2020, Osaka,Japan

Abstract Citation :A Adenigba, Design and fabrication of three phase poultry bird de feathering machine , Agri farm 2020, August 26-27,2020, Osaka ,Japan.