Development of Fabricated Hammer-Type Milling Machine: An Assessment in Processing Livestock Feed Meal Ingredients

Manuel A. Bajet Jr.

University of Northern Philippines, Philippines

Correspondence

University of Northern Philippines
Vigan City 2700, Ilocos Sur,
Philippines

E manuelbajet@gmail.com
manuelbajet@yahoo.com

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Abstract

Hog raising is very common to Filipino families both in the backyard and in commercial piggery production. Milling machine is seen as important equipment to grind the different type of feeds materials to complete desired feed formulation for hogs. The study focused on the development of a fabricated hammer-type milling machine and assessed the capacity in processing livestock feed meal ingredients. Project method was used in the fabrication, while experimental research was applied to test the performance in the production of feed meals. Evaluation of the machine focused on its production capacity per kilowatt hour (kWh), spout opening, grinding opening, and motor current drawn. The efficiency of the machine was evaluated in terms of its performance on production of granulated and pulverized dried feed meals ingredients. Return on investment (ROI) and payback period were also evaluated. Findings showed that the fabricated machine has 1.5 kW, 220 V, and have a normal full load current at 2.72 kWh. It has a spout opening of 40%, discharge grinding opening of 50%, and draw a motor current 12.45 A. Yearly production volume of the machine are as follows: pulverized yellow corn – 75,985.92 kg or 1,519.72 sacks; crack US Soya Hi pro – 217,105.92 kg or 4,342.11 sacks; and rice bran – 234,391.68 kg or 4687.83 sacks. Thus, the machine is capable of producing the required ratio of pulverized ingredients specifically for yellow corn (26.80 kg or 53.62%), U.S. Soya Hi pro (9.65 kg or 19.30%), and rice bran (2.75 kg or 5.5%) which composed 78.43% of the total feed composition requirements for a 50-kg grower mash for hogs. ROI was at 62.63% and the payback period was 0.083 years. It is recommended that hog raisers acquire their own locally fabricated milling machine to reduce the cost incurred in hog raising.