MANUFACTURING AND IDENTIFING THE OPTIMUM OPERATING PARAMETERS OF A LOCAL PELLET MILL MACHINE TO PRDUCE AQUATIC FEED

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ABSTRACT

This research aimed to evaluate and identify the optimum processing parameters of a locally manufactured flat die pellet mill machine to produce high quality aquatic feed pellets at a minimum cost. The machine includes mixing and pelleting the formula in one step. The study examined the influence of feeding rate, roller speed, and rollers teeth width on pellets quality indicators (pelleting efficiency, pellets durability). The operating parameters under this study were roller speed (155, 185, 215 and 230 rpm), machine feeding rate (200,300,400 and 500 kg/h) and roller teeth width (6 and 10 mm). The results demonstrated that the optimum pelleting efficiency and pellets durability of 94.8 % and 87.5% were obtained at 215 rpm roller speed and 400 kg/h feeding rate with 10mm teeth width. The best pellets water stability of 90% obtained after 15 min using stander formulation at 215 rpm roller speed, 400 kg/h feeding rate and rollers teeth width of 10 mm. These optimum values were chosen according to the production rate and less energy consumption and cost of unit mass. It can be concluded from the obtained results that roller speed, roller teeth width and feeding rate are among the most interacting process variables affecting pellets durability, specific mechanical energy, pelleting efficiency and pellets water stability.