

A Product-Mix Optimization of Commercial Chicken Feeds in a Feed Milling Company Using Linear Programming (LP) Model

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Abstract

Linear programming (LP) is one of the best known tools of Operations Research. Its general objective was to determine an optimal allocation of a firm's limited resources among competing demands. Allocation problems could be product-mix or blending problems. LP models are mathematical representations of constrained optimization problems. Optimization is defined as searching for the best possible solution to a problem. In this study, company's scarce resources were considered such as labor, machine, raw materials, and demand for the products. Four commercial chicken feed types were studied such as Chicken Starter Crumble, Chicken Layer Crumble 1, Chicken Layer Crumble 2, and Grower Crumble. Optimal quantities of various feed types resulting from LP modeling were determined using George B. Dantzig's simplex algorithm. The level of significance used for the hypothesis testing was 5 percent using the t-test. After solving the problem using TAHA's TORA software, it was found out that the average daily profit using the current production plan was less than that of the optimal production plan although the difference was not significant. Therefore the researcher recommended to use the optimal production plan in order to maximize the company's total profit in terms of peso value. The contributions of the study to the host company were: (1) increase in profits; (2) efficient and effective use of resources; and (3) productivity improvement.

Biography

Ronald S. Mariano is an Assistant Professor and a full time permanent faculty in the Department of Industrial Engineering, School of Engineering at the Colegio de San Juan de Letran, Bucal, Calamba City, Laguna, Philippines for 15 years. He earned his B.S. in Industrial Engineering and Master in Business Administration from the Colegio de San Juan de Letran, Bucal, Calamba City, Laguna, Philippines. He was also a Professional Industrial Engineer (PIE) certified by the Philippine Institute of Industrial Engineers – Industrial Engineering Certification Board. A member of the Philippine Institute of Industrial Engineers and the Operations Research Society of the Philippines. He also earned units in Master of Science in Industrial Engineering from the Department of Industrial Engineering and Operations Research at the University of the Philippines, Diliman, Quezon City, Philippines. He has taught courses in Operations Research, Industrial Quality Control, Methods Engineering, Business Process Reengineering, and Systems Engineering. He was also an international lecturer/consultant at Taiz University Master of Science in Engineering and Management last September 2010. He was also a regular panelist in the industrial engineering research proposal and final oral defense.