Cost Minimization of Balanced Mix for Cattle Feed

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Abstract: The present study minimizes the costs, through linear programming, of optimal balanced mix for livestock feed from a Mexican company that is on the agricultural sector. Its objective is to determine the optimal ingredients' amounts by taking into consideration the highest nutritional value for fattening beef cattle and by getting the lowest cost per kilo of balanced mix. Currently, the company mixes eight ingredients without considering the nutritional contribution. According to a research carried out, the percentage of ingredients necessary for the fattening of livestock must be considered. A linear programming model was designed to determine the quantities of each ingredient complying with the livestock's nutritional restrictions and considering that the required mixture is equal to 5000 kg. Restrictions were determined according to the required quantities by considering a maximum of 33% protein, 8% crude fiber, 10% sugars, 12% minerals, 32.5% carbohydrates and a minimum of 2% fat and 2.5% food supplement. Then, the model was resolved, after that the results were validated and the solution was implemented. The results show that the optimal combination is to use four out of the eight ingredients, nutritionally balancing the feed for livestock, managing to reduce the cost of the mix by 20%.

Keywords: Minimizing cost, Linear programming, Cattle feed mix.