The objective of this study was to determine the relationship between efficiency and cost of milk production in Kenya. Data were collected from a sample of 135 farms in Embu and Meru counties through a cross-sectional survey in 2010. The sample size was arrived at using the Fischer's formula. Data was analyzed using the FRONTIER 4.1c econometric model to obtain both the technical and cost efficiencies. Derived mathematical formulae were used to obtain the potential cost reductions. Technical and cost efficiencies were calculated to be 0.837 and 1.044, respectively. Assuming obtained efficiencies were to attain the frontier target, mathematical computations indicated that cost per litre of milk could be reduced from the observed Ksh. 38.5 to Ksh. 30.9. Conclusions were that dairy animals were overstocked, underfed, and farm labour under-utilized. Results further showed that efficiency could be increased through increase in quality and number of livestock extensionists, encouraging farmer group membership, and having bigger farmlands. It is recommended that the policy be formulated to address land ownership (size), number of extension staff, and the factors that lead to high dairy input costs. It is further recommended that farmers consider enterprise specialization in order to optimize on dairy, join groups, and seek extension services when needed. Researchers should develop options for nutritious fodder and forage plants that could do well across varying agro-climatic zones.