Data from the literature and the Kenya Milk Record Organisation and Livestock Recording Centre were input to an interactive computer program (PRY) to study the magnitude of changes in yields and product prices required to e counterbalance increases in reproductive wastage and mortality in Kenyan smallholder herds of dairy cattle. The program determined the culling strategy which gave the highest feed energy efficiency (total output value per unit of dry matter intake). The cull-for-age threshold of breeding ♀♀ was 135 months, and the optimum disposal ages for young ♀♀ and ♂♂ were 27 and 9 months respectively. Feed energy efficiency was highly sensitive to changes in calving interval, age at 1st calving, and selective culling rate per parity (SCRAP) in heifers, but there was negligible sensitivity to changes in mortality rate and SCRAP in cows. The interaction with the greatest effect on feed energy efficiency was that of calving interval with age at 1st calving. The optimum culling strategy indicated by the study was the current practice on Kenyan smallholder dairy farms.