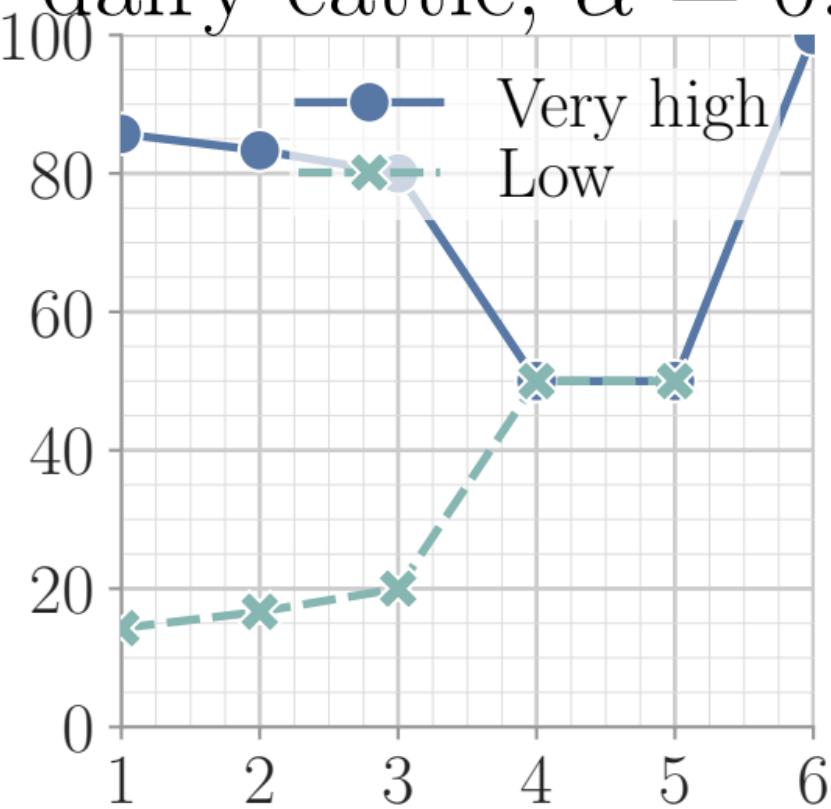dairy cattle, $\alpha = 0.5$