3.13.11 Constraints on intake

Once an estimate of potential intake for forage biomass had been obtained for the selected cell, tests of three constraint terms were carried out to test whether daily intake requirements had been satisfied or available foraging time used;

1. Digestive constraints. Daily herd potential intake was predicted from the gut capacity of animals to process forage of a given digestibility, weighted by herd composition. Forage digestibility was calculated as the weighted mean digestibility of plant parts in the diet mixture. Forage biomass was consumed until cumulative daily intake met herd potential intake, upon which foraging was terminated for the day.

2. Metabolic constraints. Daily herd potential metabolic energy intake was predicted as the running mean of the previous ten days of foraging. A running mean was used to minimize variation in the estimate. Forage biomass was consumed equivalent to the energy intake predicted by this upper limit.

3. Time constraints. The daily time available for foraging was net the time required to commute to the first cell in the daily foraging pathway, commute between cells, and return to water at the end of the day. During the wet season, there was no water-related time costs.

If the grid-wide search used as a last resort during assessment failed to reveal an accessible target cell for selection daily intake was terminated.

This conversion factor in Equation 3.8 required sufficient variation in E_{ij}^R to operate. A sensitivity analysis revealed a threshold value for the CV in E_{ij}^R equal to 1% and identified a solution for more homogeneous landscapes. This alternative "use biomass contingency rule for homogeneous landscapes" (*UBRule*) needed to be independent of energy intake rate to avoid seasonal effects, and simply allocated 50% of the forage biomass within a cell as potential intake, and available for consumption (Appendix 7).