

# Starvation Dynamics of a Dumb and a Greedy Forager

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What is the fate of a forager that depletes its environment as it wanders? We investigate this question within the "starving" random walk model, in which the forager starves when it travels  $S$  steps without eating. The forager consumes food whenever it is found and becomes fully sated. However, when the forager lands on an empty site, it moves one time unit closer to starvation. We determine the forager lifetime, analytically in one dimension and numerically in higher dimensions. In two dimensions, long-lived walks explore a highly ramified region so as to remain close to food.

We also investigate the role of greed, in which the forager preferentially moves towards food when faced with a choice of hopping to food or to an empty site. Paradoxically, the forager lifetime can have a non-monotonic dependence on greed, with a different sense to the non-monotonicity in one and in two dimensions.