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Can flies still taste foods after they have been swallowed?

Animals have evolved complex mechanisms for evaluating food in their environment. Distinguishing between nutrient-rich and potentially dangerous foods typically involves peripheral chemosensory input, which is mediated by sensory cells within the oral cavity. Activating specific peripheral sensory cells can also elicit a rejection response, as in the case of bitter tasting compounds. Given that “bitter” tasting compounds are often associated with noxious foods, a rejection response allows the animal to avoid potentially toxic compounds. Recent studies have demonstrated that mammals have mechanisms for “tasting” potential poisons in their gastrointestinal tract. It is well established that adult flies (*Drosophila melanogaster*) use taste sensilla associated with their mouthparts to initially taste foods. We asked whether they also have mechanisms in their gut for evaluating foods. Our strategy was to use *pox-neuro* (*poxn*) mutant flies, which lack taste sensilla associated with their mouthparts. We reasoned that if the *poxn* flies reject aversive taste stimuli, then this would provide evidence that they possess post-ingestive “taste” mechanisms for detecting potential poisons.