



Infants' Consumption of a New Food Enhances Acceptance of Similar Foods

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The number of feedings needed to increase intake of a novel target food was investigated, and whether exposure effects generalized to other foods in a sample of 4 to 7-month-old infants ($N=39$). Other foods varied in their similarity to the target food, including the same food prepared by another manufacturer, similar foods (other fruits for infants receiving a target fruit) and a different food (e.g. vegetables for infants receiving a target fruit). Infants were fed the target food once a day for 10 days. Intake was used to indicate acceptance. Results revealed that exposure dramatically increased infants' intake of the target food, from an average of 35–72 g. Intake of the different food was unchanged. Same and similar food intake increased with target food exposure. Intake of the target, same and similar foods nearly doubled to 60 g after one exposure to the target food. These rapid increases in intake contrast the slower changes seen in young children. Results for the other foods suggest that infants may have difficulty discriminating among many foods.

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INTRODUCTION

By the middle of the infants' first year of life, an exclusive milk diet is no longer adequate to maintain growth and health. Current recommendations are that solid foods should be introduced when infants are between 4 and 6 months old (Hendricks & Badrudden, 1992). When the infant begins this transition to the omnivorous diet, all foods are new, and the infant must come to accept some of them to obtain adequate nutrition. Although there is limited research on infants' reactions to new solid foods, research with older omnivores indicates that while we need dietary diversity, we are also neophobic and do not readily accept new foods. This has been termed the "generalist's dilemma" (Rozin, 1976). The neophobia can be reduced via repeated exposure to foods. Previous research with infants (Sullivan & Birch, 1994), young children (Birch & Marlin, 1982), adults (Pliner, 1982) and other omnivores (Rozin, 1976) has shown that, while many novel foods are initially rejected, when these foods are consumed in the absence of gastrointestinal illness, neophobia is reduced and intake increases.

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With respect to the mechanisms responsible for the reduction in neophobia, Kalat and Rozin's (1973) research revealed that increases in intake of, and preference for, initially novel foods that occur as a result of repeated exposure result from "learned safety". The neophobic rejection of novel foods can be viewed as an adaptive response, protecting the individual from poisonous substances. Consuming new edibles can be a very risky business: the substance could be toxic, potentially causing illness or death. "Learned safety" holds that only when repeated consumption of the new food is *not* followed by negative gastrointestinal consequences does the neophobic response diminish. On the other hand, when a food is eaten and gastrointestinal illness follows, a learned aversion to the food can result from only one pairing of the food with illness, and that food is subsequently avoided or rejected. In fact, conditioned aversions are much more readily formed to novel foods than to familiar foods (Andresen *et al.*, 1990; Domjan, 1977), and the neophobic response to new foods tends to be strengthened in animals that have learned aversions to new foods (see Domjan, 1977 for a review of factors that enhance or attenuate the neophobic response).

This research was designed to investigate infants' neophobic response to new foods, and to explore factors that could moderate or attenuate the neophobic response in order to facilitate infants' transition to the omnivore's varied diet. In particular, we investigated: (1) how much experience with a new food was sufficient to increase infants' intake of that new food; and (2) whether experience with one food was sufficient to increase intake of other new foods, varying in their similarity to the target food. Repeated exposure to new foods has been shown to be an effective way to reduce neophobia, but there is conflicting evidence regarding how much experience is necessary to reduce the neophobic response.

Research with 2 to 5-year-old children has shown that as many as eight or ten exposures to a new food may be needed to reduce the neophobic response and increase acceptance (Birch *et al.*, 1987; Birch & Marlin, 1982; Sullivan & Birch, 1990). In contrast, research conducted with another omnivore, the rat, has revealed that even a single experience with a new food may be sufficient to produce a preference for that food over another new food (Siegal, 1974). There is also evidence that experience with new foods can have effects on the acceptance of other new foods: experience with one flavour can also reduce the neophobic response to other new flavours, at least when the flavours are similar (Braveman & Jarvis, 1978; Capretta *et al.*, 1975). Pliner *et al.* (1993) studied adults participating in a single tasting session, consisting of a set of either novel or familiar foods. They noted that those who tasted the novel foods subsequently indicated greater willingness to taste other novel foods. When Capretta *et al.* (1975) gave young and old rats prior experience with either one or a variety of flavours, young rats showed a reduced neophobic response to other new foods, relative to rats that had experience with only a single flavour. This variety effect on acceptance was not seen for older animals. In previous research with weanling infants, we also found what could be interpreted as a variety effect. Many of the flavours from the maternal diet are present in her milk, and research by Galef and Beck (1991) has indicated that the presence of these flavour cues in milk are important in facilitating rat pups' acceptance of the maternal diet during weaning. Consistent with this, we noted that human infants who had been previously breast-fed showed more ready acceptance of new solid foods than did formula-fed infants, whose flavour experience was much more limited (Sullivan & Birch, 1994).

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