

## Sensory Responses and Changing Body Habitus Revisited

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Taste and flavor-odor functions (i.e. detection or recognition thresholds, suprathreshold intensity, and preferences) have been measured in states of altered body habitus such as obesity or anorexia or following weight shifts. However, most comparisons of sensory responses examine self-selected non-naïve obese or anorexic "patients" with preference shifts following weight changes possibly related to food appropriateness or to abstinence itself. Finally many sensory studies do not measure food selection or consumption or do so only in single meal contexts and thus fail to correlate preferences with food choices or consumption and ultimate body habitus.

These methodological and interpretative cautions require alternative designs using subjects randomly assigned to conditions of weight loss or gain, employing subjects losing weight naturally, or using animal models. We have examined the stability of sensory responses within subjects following repeated testing or experimental alterations in body habitus in:

*Healthy "normal" subjects* (non-anorexic/non-obese), to see if experimental alterations in weight status (i.e. gain-loss) affect sensory responses and nutrient choice (Grinker *et al.*, 1990). Food intake and preferences for foods varying in nutrient content (protein, fat, carbohydrate-rich dessert, etc.) are measured concurrently with repeated sensory testing.

*Young subjects*, i.e. infants at risk for developing obesity or mothers losing weight "naturally" postpartum. At birth, infants of obese and normal fatness mothers show equivalent sucking patterns to sweet solutions but infants with obese mothers are more responsive (increased sucking rate, bursts) by 3 months and demonstrate sustained and consistent differences in weight gains from birth to 18 months (Grinker *et al.*, 1986, 1989). Obese mothers offer greater variety of solid foods to infants (possible overfeeding) and display enhanced preferences for sweet/fat solutions at 3 months postpartum compared with normal fatness mothers.

*Animal models*, in which sensory responses are related to responses to dietarily induced obesity. Sprague-Dawley male rats can be categorized on the basis of sensory responses to acute presentations of sucrose solutions into high and low responders and relationships obtained among sensory responses, food intake and per cent weight gain on high-fat diets. Sensory responses to fat-carbohydrate emulsions can be similarly categorized but are unrelated to responses to high-fat diets or sucrose (Grinker & Block, 1991). Biochemical data and preliminary data linking differences in dietary response with noradrenergic binding are also obtained (Grinker, 1988; Jhanwar-Uniyal *et al.*, 1989). Similar findings of sensory responses and variability in weight gain are seen in aging female mice.

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