# Eating Behavior of Rats: How Macronutrient Self-Selection Relates to Emotionality


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## I. Ingestion and Emotion

Food preferences relate to emotion and stress. These systems interact due to the hedonic value of tastes, the post-ingestive feedback with which difference tastes are associated, and the memories of these emotional effects.

## II. Occidental College Rat Lines

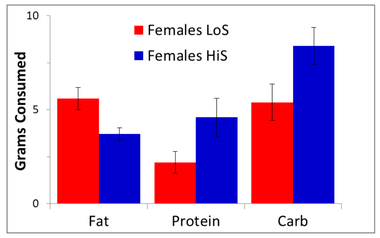
Taste-emotion relationships are shown in selectively bred rats based on a taste phenotype using saccharin intake.

- Low-saccharin consuming rats (LoS) are stress prone and more anxious
- High-saccharin consuming rats (HiS) are stress resistant and less anxious

Examining how LoS and HiS rats' respond to tastes and foods is a means of studying relationships between eating and emotion.

## III. Replicate Study

In a study with pure macronutrients, HiS females consumed more carbohydrate relative to fat than did LoS females. To be responsive to the "replicability crisis," we conducted a direct replication in new, replicate lines.

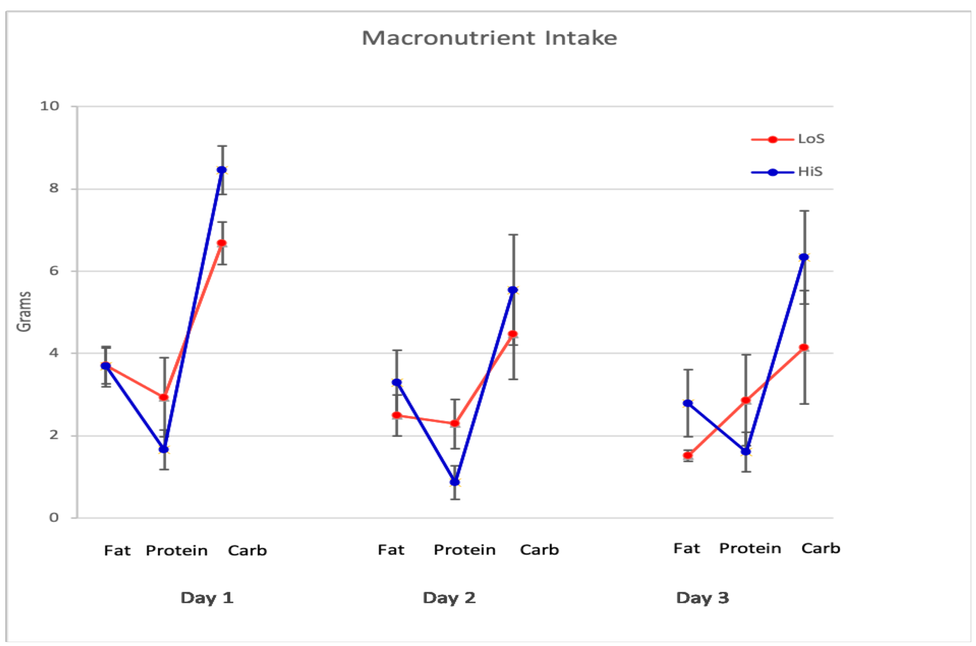



## IV. Macronutrient Self-Selection

- Female LoS and HiS rats ($n$ = 8) from the first two generations of replicate lines
- Rats had concurrent access to a fat (lard), a carbohydrate (corn starch), and a protein (casein) on three consecutive days
- Jars of macronutrient were weighed in the afternoon before being placed into the cage, and uneaten macronutrient was weighed the next morning. Chow was continuously available.

**Figure 1.** Jars of macronutrients were concurrently available, allowing the relative intake of each macronutrient to be measured.

**Figure 2.** Carbohydrate was eaten the most and protein was eaten the least. Overall intake of macronutrients was highest on Day 1.




## V. Summary

- In this first generation of the replicate lines, overall intake was higher for carbohydrate and on Day 1.
- Carbohydrate intake was slightly higher among HiS rats. Fat intake also was higher among HiS rats, whereas LoS rats ate more protein than HiS rats.
  - However, these line differences were not statistically significant.
- Stress-resistant rats' preference for carbohydrate may indicate that it was the tastiest macronutrient, putting more importance on the hedonic experience than the nutritive aspects of food.
  - Whether this trend emerges as significant in future generations remains to be determined.

**Acknowledgements:** Funding was provided by the Ford Research Mentor's Endowment Fellowship and by the Occidental College Undergraduate Research Center.

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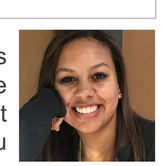

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