



Diet-induced impulsivity: An investigation of bias and sensitivity

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Obesity & Impulsive Choice



Obesity & Impulsive Choice

- The correlation between obesity and impulsive choice could be due to:
 - (1) trait impulsivity as the cause of obesity
 - (2) obesity as the cause of trait impulsivity
 - (3) another related factor, such as diet, causing both

Primary goal:

Understand how high-fat and high-sugar diets affect impulsive choice behavior

General Methods

- 2 experiments
- Male Sprague Dawley rats
- 8-week diet manipulation
- Control for calories across groups



Control
25 g of chow



High-fat
15 g of chow
4.38 g of lard

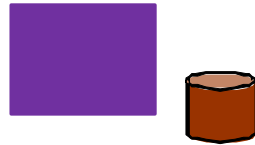


High-sugar
15 g of chow
10.33 g of sucrose

Impulsive Choice Task



SS = 5 → 10 → 20 s, 1 p

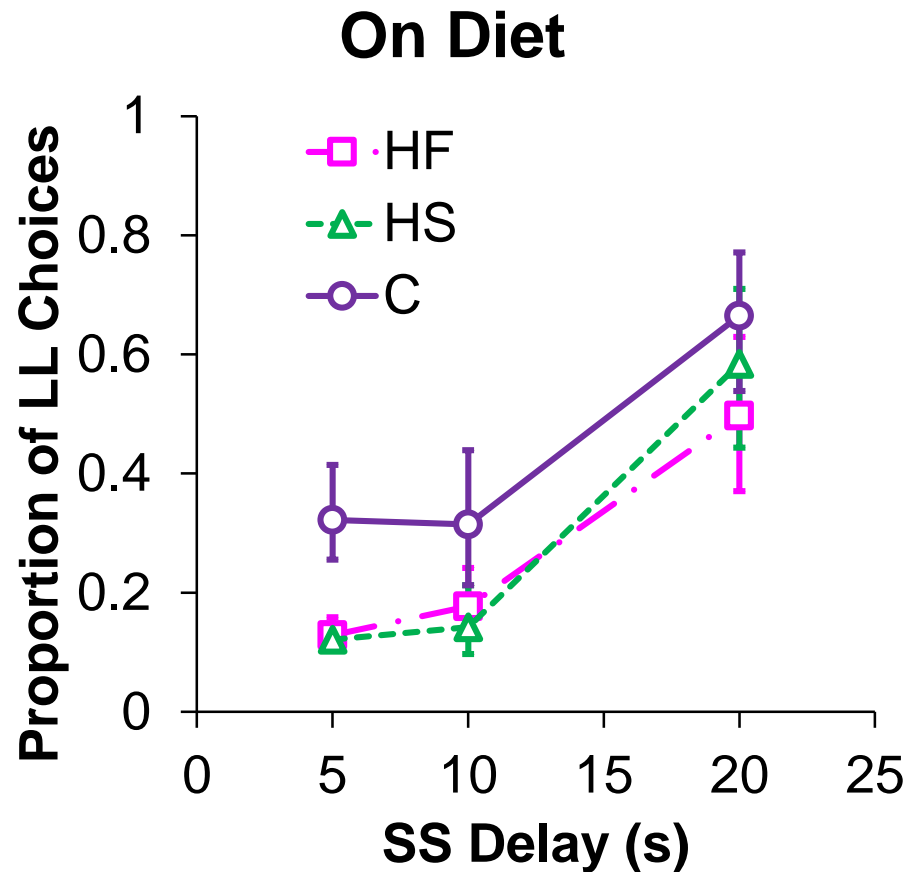


LL = 30 s, 2 p



Bias versus Sensitivity

Experiment 1: on versus off



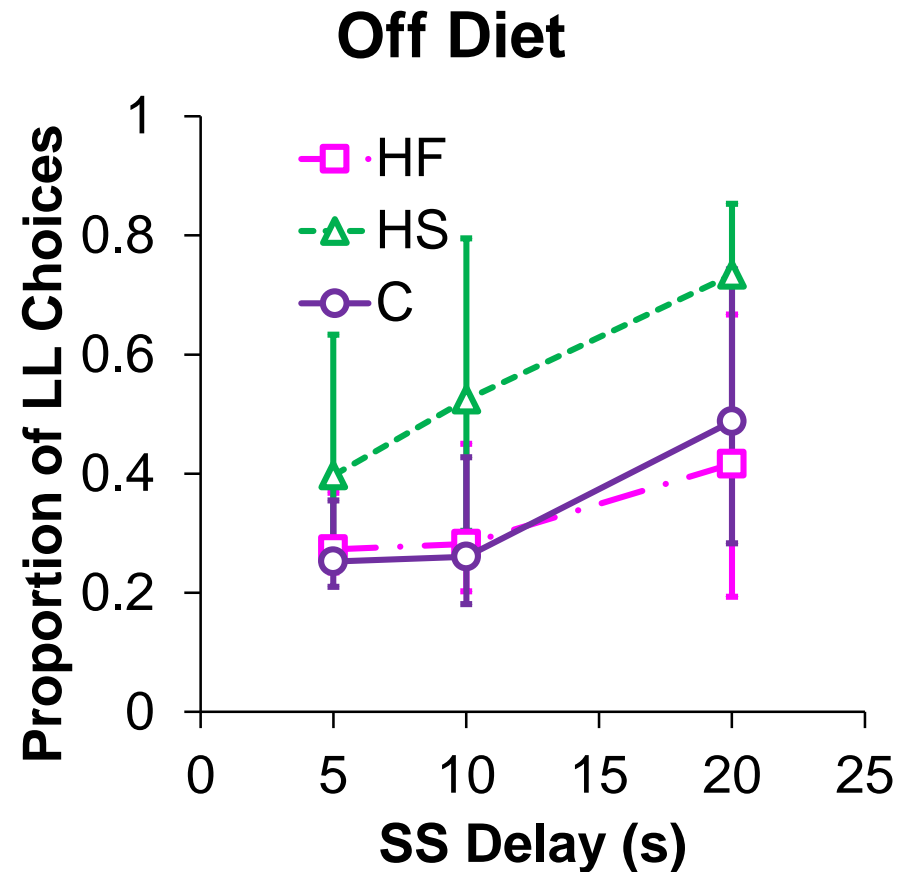
Bias for immediate reward (0-s SS delay):

- Chow: 0.095
- Fat: 0.018*
- Sugar: 0.010*

Sensitivity to delay

- Chow: 4.41
- Fat: 5.75*
- Sugar: 7.48*

Experiment 1: on versus off



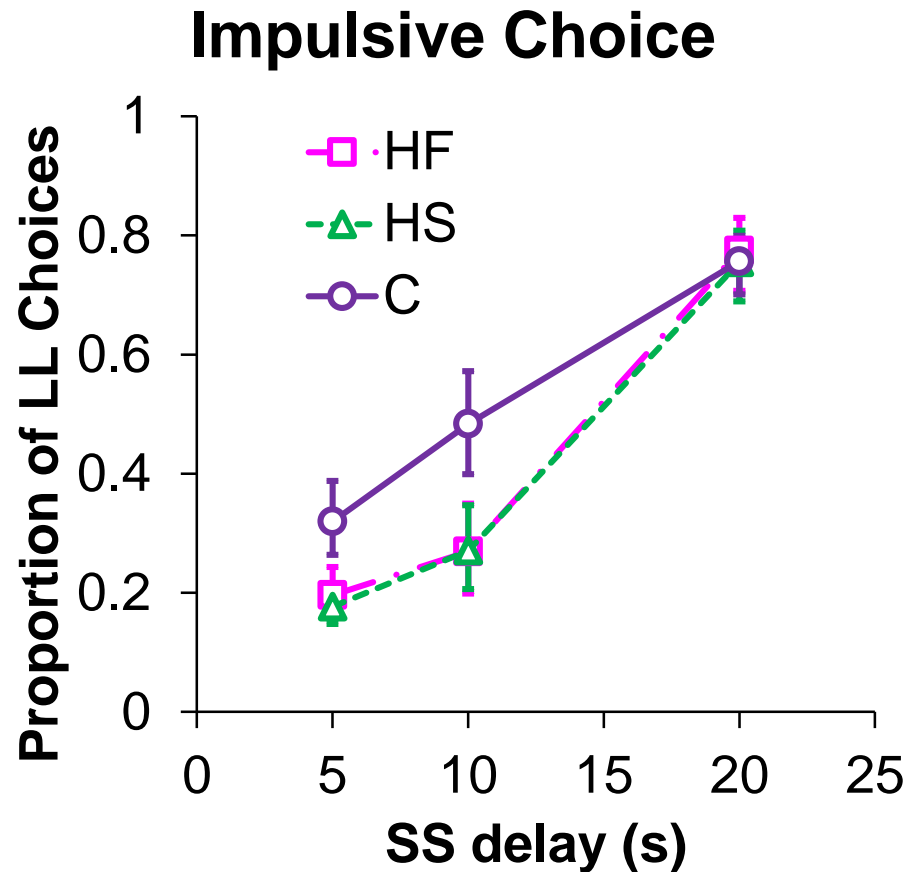
Bias for immediate reward (0-s SS delay):

- Chow: 0.033
- Fat: 0.028
- Sugar: 0.093

Sensitivity to delay

- Chow: 4.33
- Fat: 4.95*
- Sugar: 5.58*

Experiment 2: mechanisms



Bias for immediate reward (0-s SS delay):

- Chow: 0.099
- Fat: 0.052
- Sugar: 0.035*

Sensitivity to delay

- Chow: 5.76
- Fat: 6.25*
- Sugar: 6.96*

Experiment 2: mechanisms

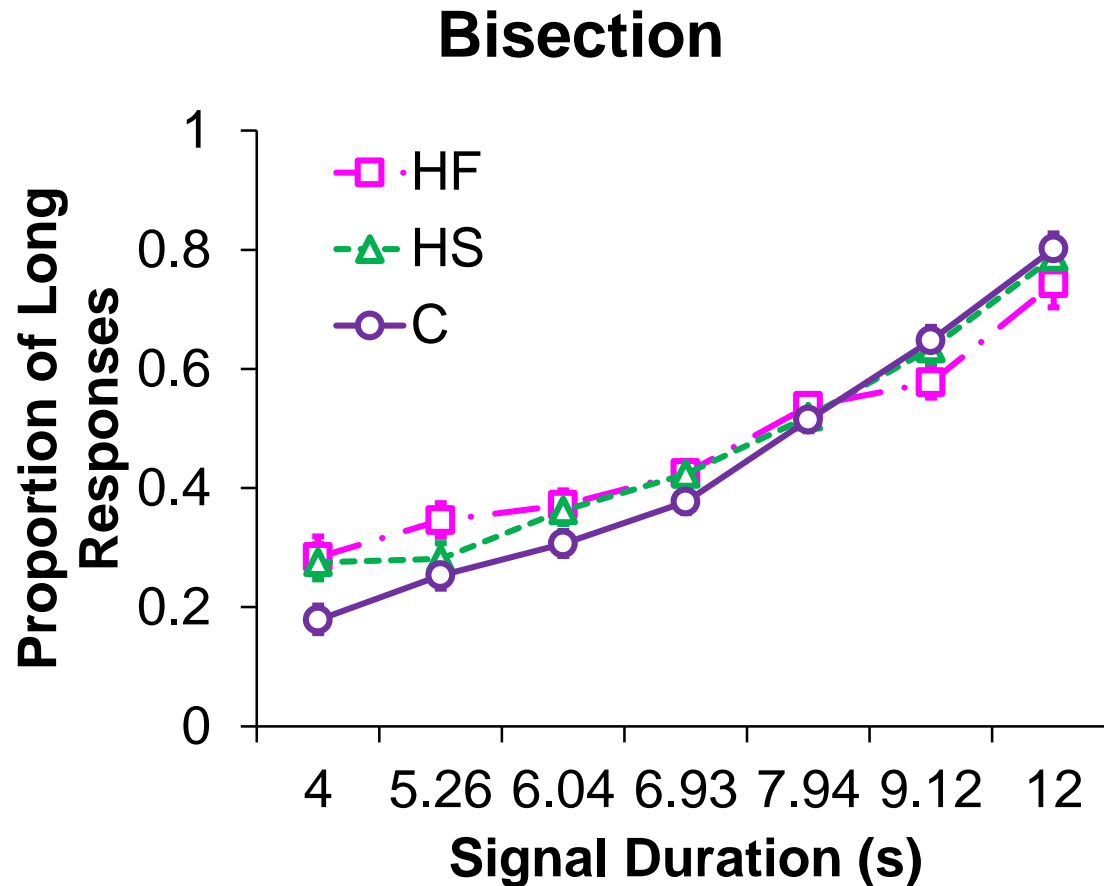
Bisection



Short = 4 s



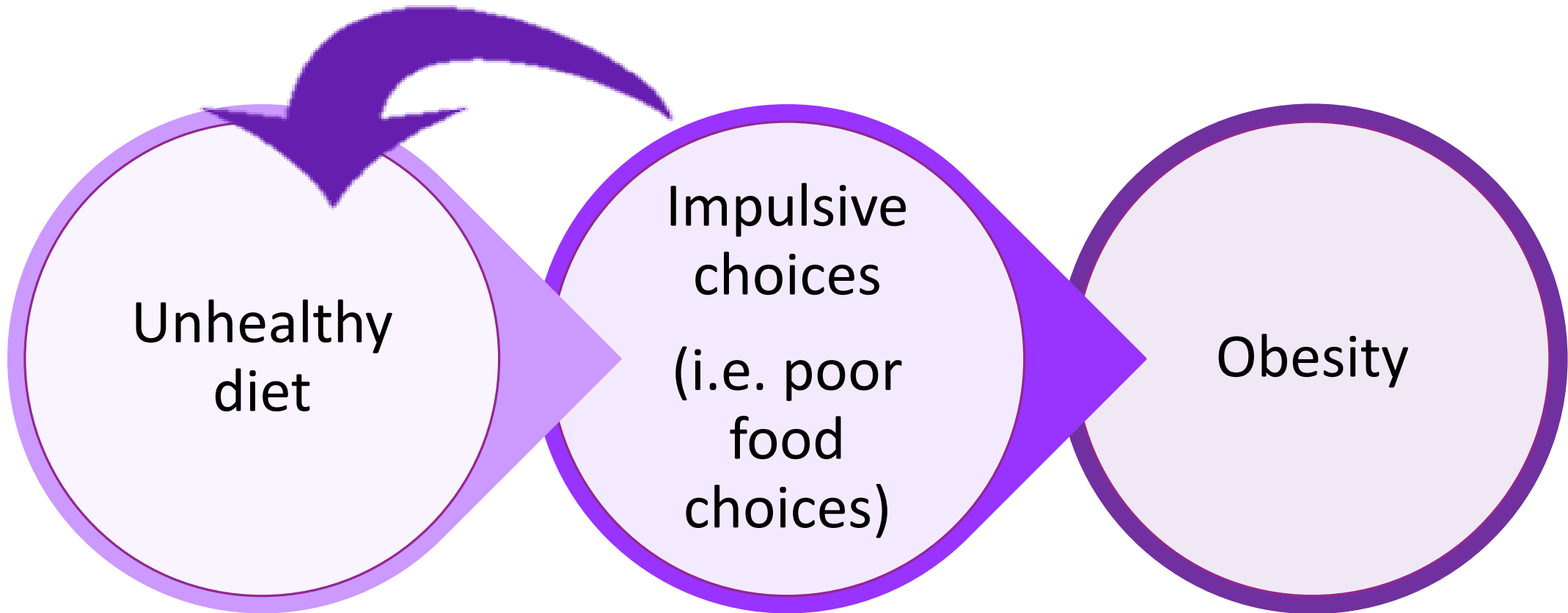
Long = 12 s



Slope:

- Chow: 0.41
- Fat: 0.26*
- Sugar: 0.32

Conclusions



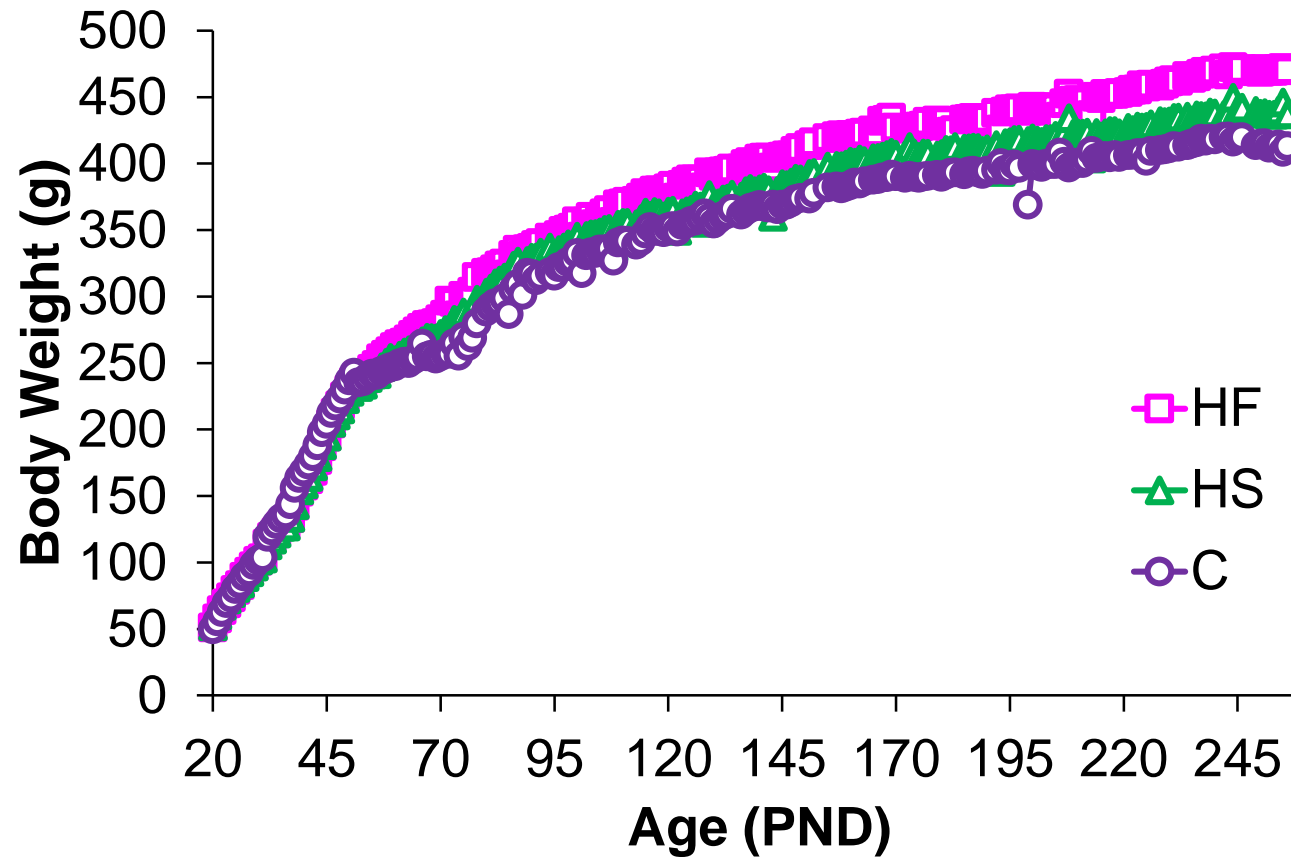


**Graduate Research
Fellowship Program**

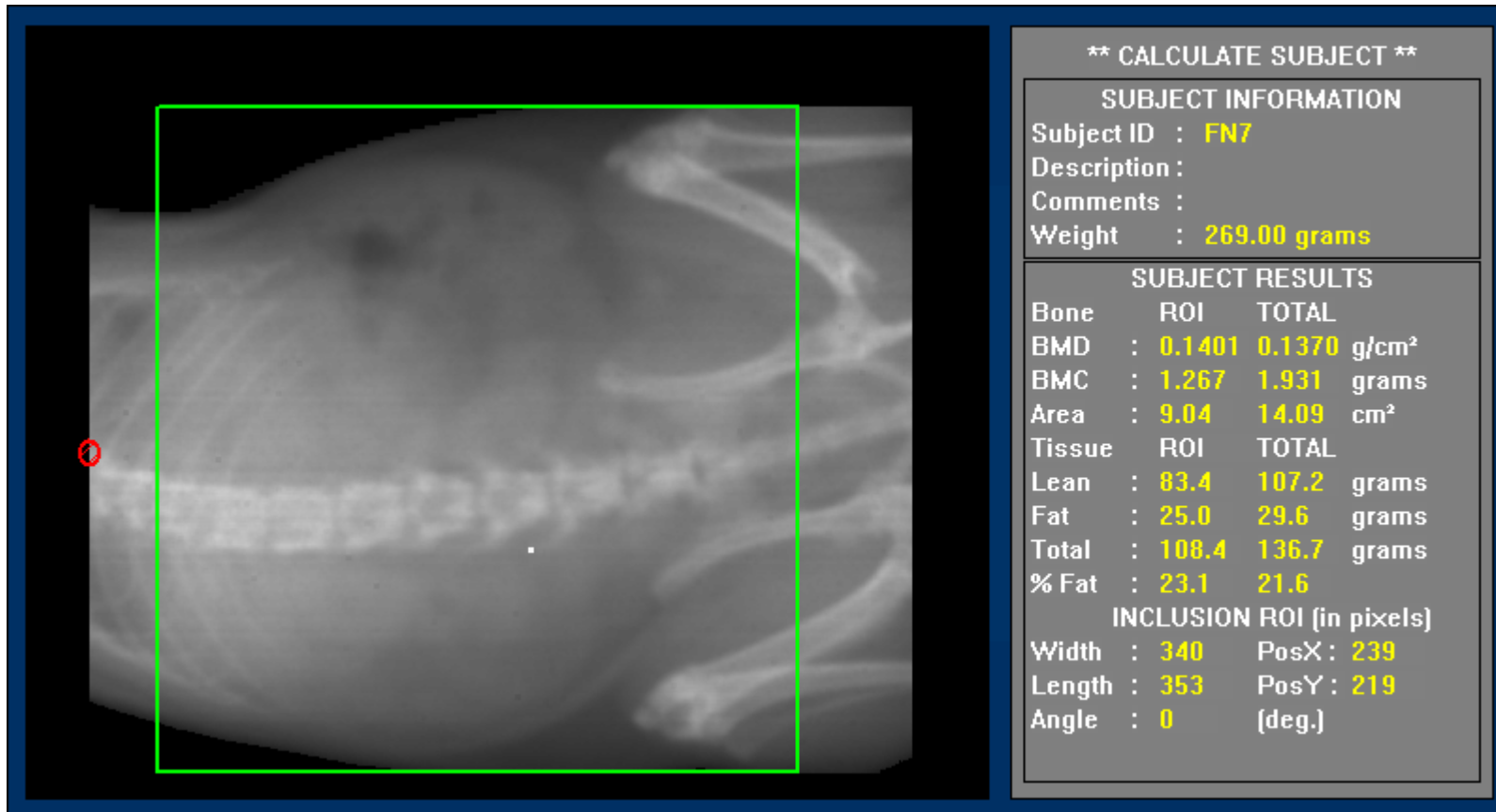


Questions?

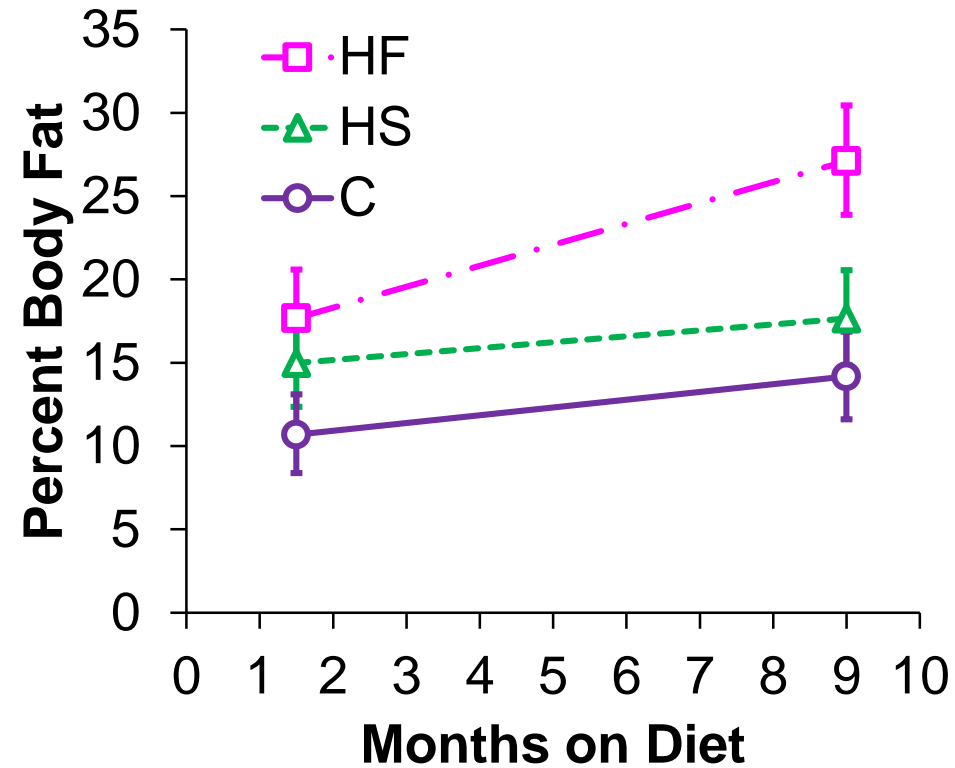
Body Weight



Body Fat (abdomen)



Body Fat (abdomen)



Overall percent body fat

- Chow: 12.15
- Fat: 21.59*
- Sugar: 15.89*