Figure No.1 Weight gain and reward dysfunction in rats with extended access to a cafeteria diet

Do rats on the extended access diet differ from the other rats in terms of weight gain and reward response?

(a) Rats were divided into three groups and fed either chow, a restricted palatable diet in which they had access to the cafeteria diet one hour each day, or an extended access diet in which the rats had free access to the cafeteria diet. The rats’ weight gain was measured as a function of days of access to their specific diets. Weight increased significantly in rats on the extended cafeteria diet compared with the chow-only or restricted cafeteria diet rats. In fact, the extended access rats gained almost twice as much weight over the course of the forty day experiment.

(b) Using the brain stimulation reward method, reward thresholds were measured as a function of days of access to the specific diet. The rats on the extended cafeteria diet had significantly higher reward thresholds, meaning that they needed greater electrical stimulation to feel like they were receiving a reward. These results indicate that there is some dysregulation of the brain's reward circuitry after being exposed to unlimited palatable food. This deficit in brain reward function has previously been shown in rats given access to unlimited cocaine/heroin self-stimulation.

Implications for Figure 1:

Only rats fed the extended cafeteria diet have significantly increased weight gain and reward thresholds, which implicates the high-fat/high-calorie cafeteria diet for these changes in feeding behavior and threshold of self-stimulation.

Proceed to Figure No.2 Patterns of consumption in rats with extended access to a cafeteria diet

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