

# <u>Diet with Higher Fat Calories and it's Consequences on Mice</u>

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#### INTRODUCTION

Every year, approximately 2.8 million people die as a result of being overweight and obese. In the United States, about 27% of the population is now considered to be obese. Obesity in general is defined as an excessive amount of body fat in relation to lean body mass. It is caused by consuming more calories than the body needs, by consuming a diet that is high in fat and calories znc or living a sedentary lifestyle. Obesity has been associated with causing a variety of health problems including cardiovascular disease, high blood cholesterol, dyslipidemia, insulin resistance, glucose intolerance, some cancers and poor female reproductive health. Compared to the general population, statistics show that HIV positive women were 17% more likely to develop obesity compared to men. Ethnicity is another factor associated with obesity and statiscs show that African Americans and Hispanics had a high incidence rate than Non-Hispanic whites. Mental health disorders, such as PTSD, are also considered aggravating factors. The aim of this study is to analyze the effect of high fat induced obesity in male mice model. Male mice were fed with normal & very high fat food (VHFD) and the levels of the hormone were measured during 2 weeks, 3 months and 6 months diet course. Within the first two weeks, drastic change in the body weight was observed which continued throughout the experiment. There was a steady increase in body weight in VHFD fed animals. The food consumption was higher in normal diet (ND) than VHFD. The calorie intake was higher in VHFD than ND indicating that it is the dense food that was responsible for the increase in body

### MATERIAL AND METHODS

**Animals:** Control male mice (5), Very High Fat (VHFD) fed male mice (15) followed 2 weeks diet course; Control male mice (5), VHFD fed male mice (15) followed 3 months diet course and Control male mice(5), VHFD fed male mice (15) followed 6 months diet course were housed in a colony room, with a partially revised light cycle of 14:10 (lights on 2300h and off at 1300h). Food and water were available ad libitum. All animals studies were conducted in accordance with Guide for the Care and Use of the Laboratory Animals, using protocols approved by the Institutional Animal Care and Use Committee at Adelphi University.

**Body weights:** The WT control (n=6) mice were fed with a normal diet (ND) from Pico Lab (Rodent Diet 20 5053) which consisted of 24.65 kcal% protein, 13.21 kcal% fat, and 62.14 kcal% carbohydrates. The WT experimental (n=8) mice were fed with a very high fat rodent diet (VHFD) from Research Diets (D12492) which consisted of 60 kcal% fat, 20 kcal% protein, and 20 kcal% carbohydrates. Body weights were recorded with a digital electronic balance over a period of 7mon. Food consumption: A quantified amount of food (ND and VHFD) was given on a particular day of the week and the remaining uneaten food was weighed every week. The amount of food consumption was calculated by subtracting the amount of food given from the amount of food remaining in the cage. Caloric intake was calculated using the values provided by the supplier (ND, kcal/gm= 3.07, VHFD, kcal/gm= 5.24). The physiological fuel value (kcal/gm) was equivalent to the sum of decimal fractions of fat, protein and carbohydrate multiplied by 9, 4 and 4 kcal/gm respectively.

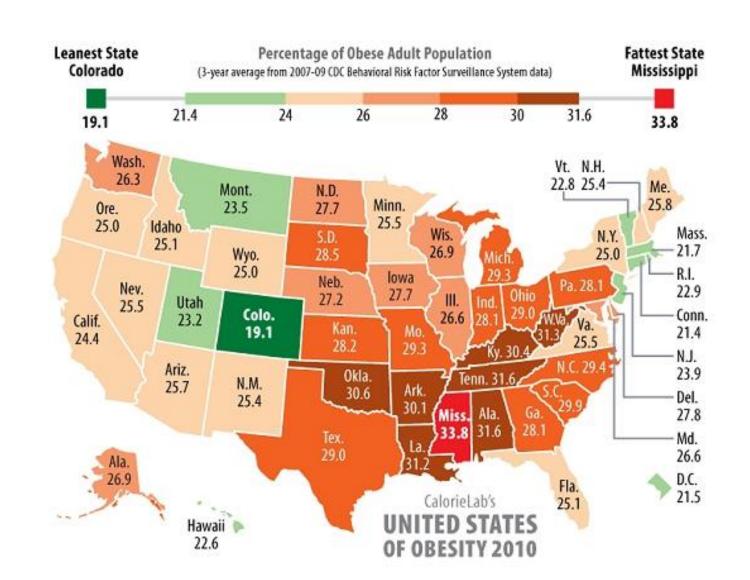
Organ weights & Histopathology: After decapitation, Viscera was opened and in situ examination was done. Pancreas, liver, adipose tissue were collected and weighed by trimming excess fat around it. Organ slices(5mm thickness) were stored in 1ml of formaldehyde solution. All the tissues were subjected to standard histological procedures and examined under a light microscope. All biopsies were done by Cross Island Laboratories, LI for biopsy.

# MICROPHOTOGRAPHS OF CELLULAR MORPHOLOGY

3 months

# 2 weeks **CONTROL VHF** CONT VHF **CONTR** VHF ROL **PANCR** EAS FAT

## **OBESITY RATES IN THE** UNITED STATES

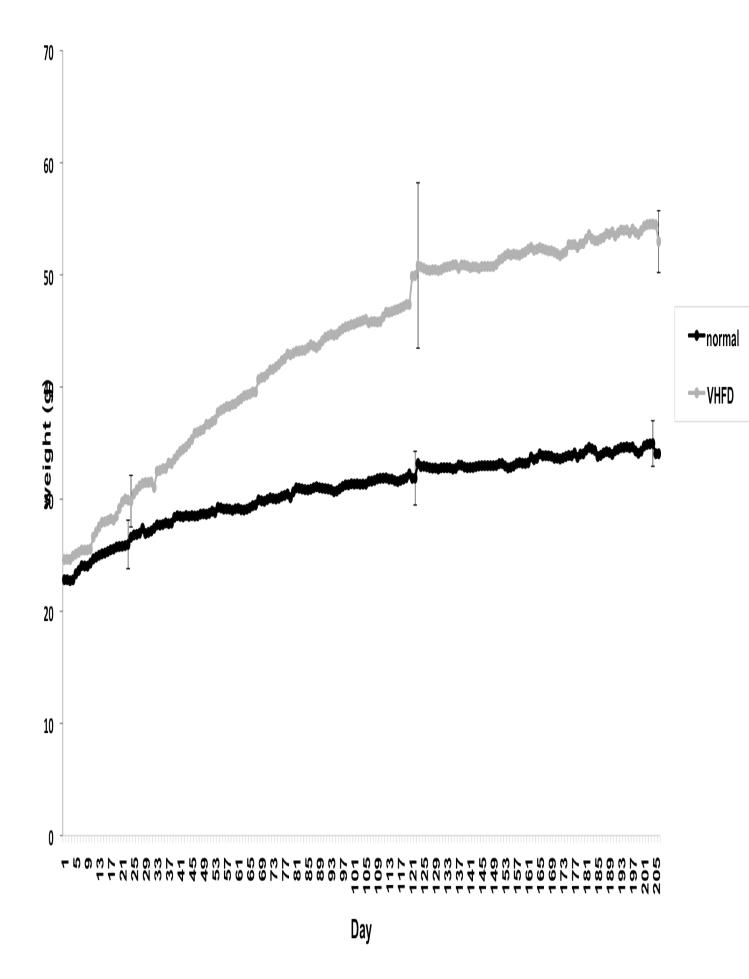




### **CHANGES IN BODY WEIGHT** WITH HIGH FAT

#### **BMI Chart Measurements**

6 months



Weight Categories	BMI (kg/m²)	1.
Underweight	< 18.5	
Healthy Weight	18.5-24.9	2.
Overweight	25-29.9	
Obese	30-34.9	3.
Severely Obese	35-39.9	
Morbidly Obese	≥40	4.

# STEP BY STEP RESEARCH **PROCEDURE**

As we analyzed the data of food consumption and its effect in the morphology of different tissues in male mice, we also researched several articles to understand the general trend in obesity in United States from PubMed and EBSCO. In EBSCO we searched for PTSD and obesity relation. In PubMed we searched for Obesity and HIV relation. The search in PubMed was categorized into Human section in which the article was at least 5 years old and it was a free full text article. We also gathered pictures from google images.

### References

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# **SUMMARY AND DISCUSSION**

- . Male mice fed with very high fat fed diet gained more weight than the normal/control male mice. However, the energy intake appeared almost similar in both control & VHFD fed mice.
- Increases in body weight was due to calorie dense food not the amount of food consumed. The 2 weeks - 3 months - 6 months very high fat diet fed male mice better mimics the stage wise pathological changes in obese humans.
- The 2 weeks 3 months 6 months very high fat diet fed male mice model better mimics the stage wise pathological changes in obese humans.
- . The obesity rate in different states shows the percent of Hispanic and non- Hispanic white in the U.S.
- Statistics showed that HIV infected women have a higher prevalence of obesity compared to men although they undergo the same treatment.
- 6. Mental disorders such as PTSD had higher chances of getting obesity but research showed that with strict diet and exercise, obesity rate decreased and the patients were much happier.

### **ACKNOWLEDGEMENTS**

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