

# HUNGER VERSUS HOARDING AND BODY WEIGHT IN RATS

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**Summary :** The present study revealed that the rats kept on two hour meal schedule hoarded large quantity of food as compared to their hoarding score when kept on food *ad lib*. Body weights were maintained even though the food intake was slightly reduced. Hunger seems to a stronger drive for hoarding.

**Key words :** hoarding score      body weights      food intake      fixed meal time

## INTRODUCTION

Laboratory rats are known to hoard food pellets in the corner of the home cage made preferably dark and separated from the main cage. It is often reported that the animal on *ad lib* diet does not hoard food pellets and that the chronic food deprivation leading to reduction of body weight by 10% or more acts as a strong stimulus for hoarding (1, 2). The work carried out in our laboratory indicates that the rats fed during fixed meal time hoard large quantities of food pellets even though the animals could maintain the body weight after an initial decrease, whereas the score is reduced when the same animals were kept on *ad lib* food schedule.

Hunger and not the reduction in body weight due to chronic deprivation of food seems to be a drive for hoarding.

## MATERIALS AND METHODS

Four adult male albino rats grown in the colony were used in the study. Each animal was placed in a separate cage having partition through which the animal can pass and approach food pellets during fixed meal schedule. Water and food pellets obtained from Hindustan Lever supplemented with vitamins and groundnut oil were administered *ad lib* for about 60 days. Body weights and food intakes were recorded during this period. The animals were then presented with enough food pellets weighed previously and kept in the outer compartment of the cage. The hoarding was allowed for 30 min and animal could

eat food from hoarded stock during this period and for subsequent 90 minutes. After a training period of 4 to 6 days, the rats learnt to hoard the food pellets and eat the food during the available time. The hoarded food pellets were separately weighed after 30 min and put back into the cage for 90 min. Food consumed by the animals during the first 30 min though small was also calculated. At the end of 120 min all the pellets hoarded were taken out and weighed again in order to compute the food consumed by the animal during 90 min period. No food was administered subsequently for 22 hr, and water was supplied *ad lib* for 24 hrs period. Hoarding score remained high under this regime. Each animal was then put on *ad lib* food intake for consecutive three days and the hoarding score determined on subsequent days. Following this they were kept on fixed meal time between 9 a.m. to 11 a.m. for two days and the hoarding score was recorded on the following days

### RESULTS

Alterations in body weight food intake and hoarding score in four rats on two hour food regime are displayed in Fig. 1. It is seen that hoarding score went on increasing in

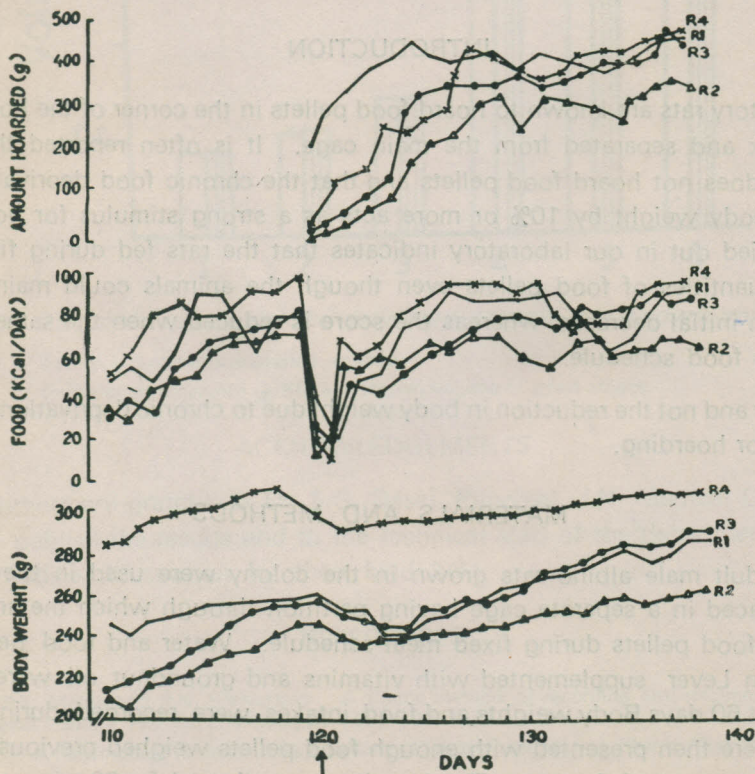


Fig. 1 : Alterations in body weights, food intake and amount of food hoarded in four rats. Two hr meal time starting with 30 min hoarding schedule commenced at the time indicated by an arrow. The initial decrease in food intake and body weight improved after about 5-8 days. The hoarding score reached a plateau after 10 days.

all animals and reached a plateau after about 10 days. The food intake was reduced initially but maintained though at a slightly low level after about 6-8 days. There was a slight decrease in body weight initially. The animals however regained body weights after 8 days. All the animals in the series were then kept on *ad lib* food regime for three days and the hoarding scores were determined. It was observed that food intake improved during the *ad lib* regime and hoarding score decreased. This period was then made to alternate with the two hr fixed meal time schedule on five occasions lasting for 2 days. During the fixed meal time period the food intake decreased and hoarding improved markedly. The body weight was maintained during this period. Typical results of one of the series (Rat No. 3) are presented in Fig. 2.

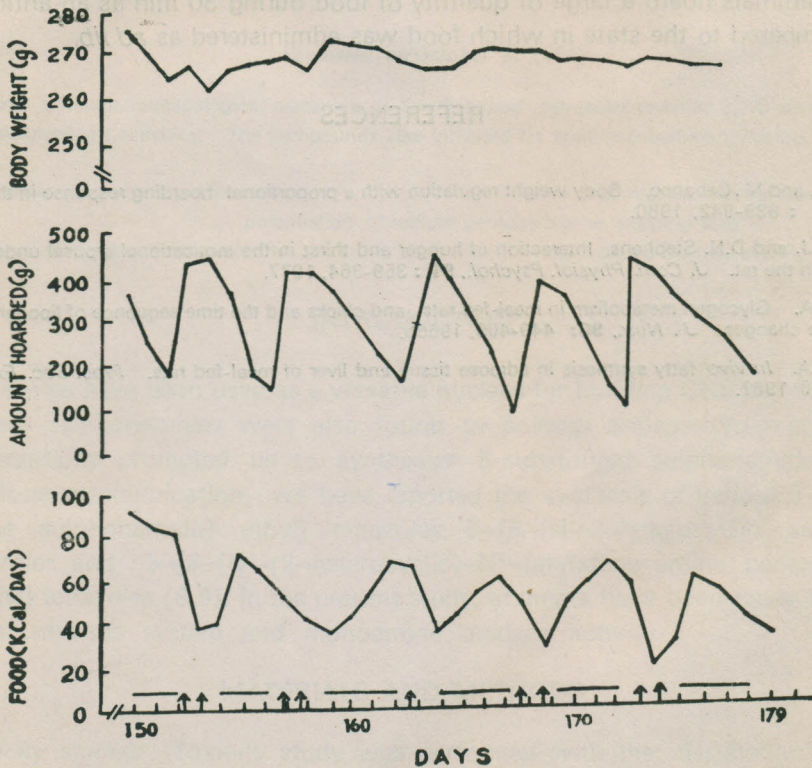


Fig. 2 : The alterations in food intake, amount of food hoarded and body weight in one animal (Rat 3) maintained alternately on hoarding schedule (indicated by arrows) and food *ad lib* for 24 hr (indicated by line —). The animal hoarded larger quantity of food following 2 hr meal time schedule.

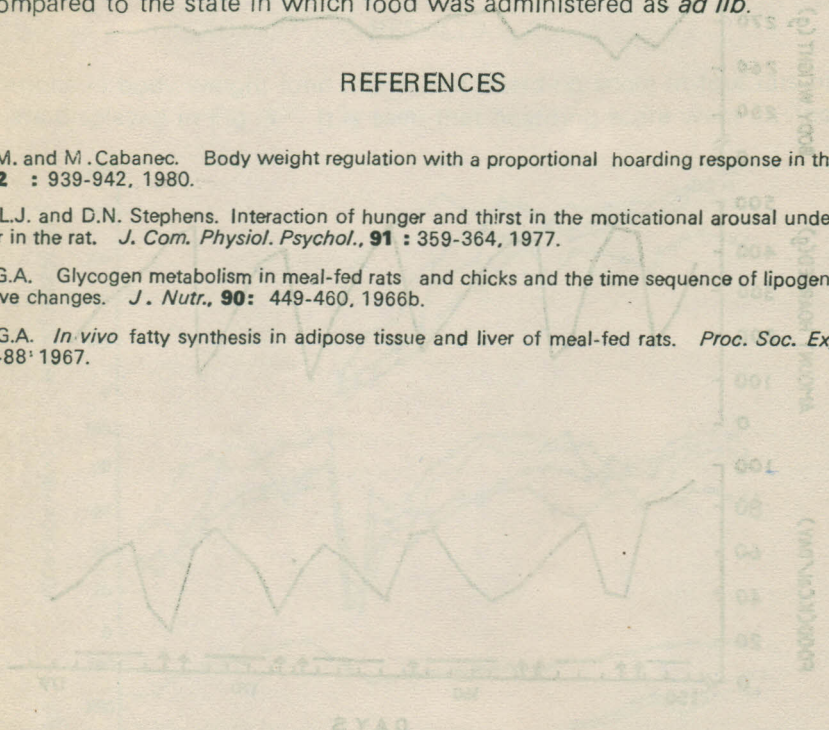
### DISCUSSION

It was observed that the rats kept on restricted meal time regime decreased the food intake initially. The food intakes however, were restored to near normal after about ten

days. The body weights were decreased initially and maintained after 8 days. It is known that animals on restricted feeding schedule maintained their body weights inspite of the reduced food intake. Such animals demonstrate a greater efficiency in converting carbohydrate to storage energy in the form of lipid and glycogen (3) and increase in fatty acid synthesis (4). The animals in the present series were observed to maintain body weights inspite of slight decrease in food intake as a long term response and developed a higher hoarding score 10 days after the fixed meal time food regime. The increased hoarding score developed after 10 days may be due to chronic deprivation of food resulting into long term deficiency of any of the dietetic constituents but not due to general decrease in body weights. The present results are at variance with those reported by others (1). It is observed that hungry animals hoard a large of quantity of food during 30 min as an anticipatory response as compared to the state in which food was administered as *ad lib*.

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(Fig. 1) Line graph showing body weight (g) and hoarding score over 10 days. The x-axis is labeled 'DAYS' and ranges from 0 to 10. The left y-axis is labeled 'BODY WEIGHT (G)' and ranges from 0 to 100. The right y-axis is labeled 'HOARDING SCORE' and ranges from 0 to 100. Two lines are plotted: one for body weight and one for hoarding score. The body weight line starts at approximately 100g at day 0, drops to about 80g by day 2, and then fluctuates between 80g and 90g through day 10. The hoarding score line starts at 0 at day 0, remains low until day 5, then rises sharply to about 80 by day 10.

### DISCUSSION

It was observed that the rats fed on restricted meal time food regime maintained their body weights. The food intake however, was restricted to 30 min during the restricted feeding period.