

CARTAS AL EDITOR

Cafeteria Diet Induced Obesity in Rats is Dependent on Parity of Dams*

Cafeteria diet (4) has been used to induce non traumatic moderate obesity in rats as a result of voluntary hyperphagia conditioned by the hedonic properties of foodstuffs. However, other factors are known to influence body weight including genetic background, number of litters and the scheduled availability of food (1). Here a result showing a not previously studied influence of parity is reported.

Pregnant Wistar rats, housed in individual cages kept under controlled conditions of light (12/12 h light/dark) and temperature ($23 \pm 2^\circ\text{C}$) have been used. Three days after birth the litter were size and sex normalized to 8 female pups, the males being discarded due to the higher females sensitivity to the cafeteria diet (2). Seven days after delivery, cafeteria diet plus commercial pelleted chow was made available to the cafeteria groups. Although the puppies do not nibble solid foodstuffs until they are about 16-18 days old, the early introduction of cafeteria diet was intended for habituation purposes; a sudden switch in their food at weaning was expected to produce a reduction in food uptake interfering with the typical overeating induced by the cafeteria diet. Controls continued receiving the normal pelleted commercial

chow. The offered cafeteria diet composition has been reported elsewhere (2, 3). After weaning, the females were housed in groups of four and they were sacrificed by using an overdose of inhaled chloroform at 30, 60 or 90 days of age.

Body weights were lower in the primipare offspring than in the multipare offspring. Body weight is highly dependent of parity ($p < 0.001$) as it was shown after a three factor (age, parity and diet) variance analysis. When parity and weight were combined with diet, the interaction remained significant ($p < 0.05$) in spite of the small number of litters studied, the analysis considering the mean litter weight instead of individual weight.

On the other hand, the individual variability within each group was relatively small, the variation coefficient ranging from 2.3 to 9.6 %: thus genetic factors are small in relation to the effect of parity. This small individual variability was expected because all animals were of the same strain, obtained from the same breeder and reared in the same ambiental conditions.

Results with respect to body length are similar as body weight; multipare offspring is consistently larger than primipare offspring and the differences are again significant for parity. The differences in body weight and length are consistent: litter from primipare origin shows an evi-

* This work has been supported in part by a grant (P 85-0326) from the «Comisión Asesora de Investigación Científica y Técnica» of the Government of Spain.

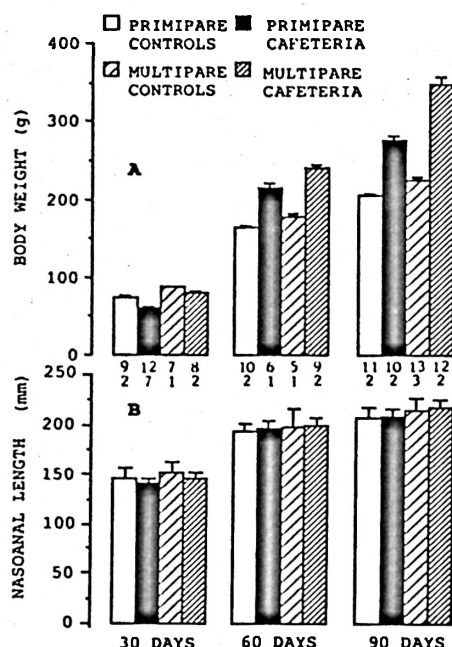


Fig. 1. Mean body weight (A) and length (B) with respect to age, diet and parity of rats. The numbers of the upper part express the animals and those of the lower part, the litter.

dent underdevelopment with respect to those produced by multipare dams.

Two reasons may explain the observed differences between groups: i) they may be due to the primipare mother inexperience in the care of its offspring which would have produced undernourishment during development. The long lasting effects of early nutrition have been repeatedly proved since the early work of WIDDOWSON and MCCANCE (6); ii) the age and body weight of the primipare and multipare mothers were very different, probably involving important metabolic and endocrine differences between them; although in this case these differences might have acted only during postnatal development, i.e. through maternal behavior, care

or lactation, this explanation being also supported by the lack of differences between foetuses born from obese and control mothers (3).

These results were an unexpected effect of parity found when preparing obese cafeteria diet rats for an intestinal absorption study. Considering the cost of preparing 100 day old obese cafeteria fed rats, the results are of interest to avoid the risk of failure in producing obesity. As parity determined deep effects on body parameters, the use of uniform parity in mother rats for nutritional studies is recommended.

Key words: Cafeteria diet, Obesity, Rat.

Palabras clave: Dieta de cafetería, Obesidad, Rata.

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(Received on March 5, 1990)

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