

High Fat Diets and Breast Cancer Risk: Effects of High Extra Virgin Olive Oil and High Corn Oil Diets on Growth and Sexual Maturation in Rats.

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In previous experiments we have demonstrated that consumption of high fat diets modify the risk of breast cancer in rats. Such effect is dependent on the type of fat, and while a high corn oil diet had a clear stimulating effect on mammary carcinogenesis, a high olive oil diet had a negative modulator effect. To get insight into the mechanisms by which the high fat diets may influence breast cancer risk, we aim to analyze if a high corn oil and a high extra virgin olive oil diet modify sexual maturation and mammary gland differentiation. Female Sprague-Dawley rats were distributed into 3 groups depending on the experimental diet subministered from weaning: A control group fed a low fat diet (LF), a high corn oil diet group (HCO), and a high extra virgin olive oil diet group (HOO). Rats were euthanized at 24, 36, 51, 100 and 246 days. The results showed that administration of the high corn oil diet, but not the high olive oil diet, increased the body weight evolution and the mass index of the animals. The day of vaginal opening was significantly advanced in the HCO group, followed by HOO group and LF group, without changes in the body weight or body mass indexes at that day among groups. Hypothalamic KiSS1 levels tended to be higher in HCO group by 36 days. No significant changes were observed in serum hormone levels or uterus and ovaries weight. Both high fat diets increased the number of corpus luteum in the ovaries at 51 days and induced subtle changes in the morphology of the mammary gland at post-puberty. β -casein mRNA levels increased over the time in the mammary glands of all groups, and we observed little changes in the expression of hormone receptors by effect of dietary lipids. Our results suggest that high fat diets, and especially the high corn oil diet, advanced sexual maturation, what can be one mechanism of the modulatory effects of such lipids on mammary carcinogenesis.

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