

Progress Report

*covering 6th quarter  
of 1954*

NUTRITIONAL AND BIOCHEMICAL EFFECTS OF RADIATION

By

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### Abstract

This report will briefly outline work presently being carried out under this Contract. No detailed data will be reported, since it is yet too fragmentary.

### Progress

Earlier studies indicated a slightly diminished reproduction in animals fed a partially-irradiated diet. These experiments have been completed except for the histological studies. A copy of the complete report will be submitted when these data are available.

The object of the continuing work is to determine whether this apparent insufficiency is due to a destruction of vitamin E or other nutrients. This phase of the work has been started only recently, and no critical data have been obtained as yet. ✓

The composition of the diet being used follows:

1000 grams ground whole wheat

147 " skim milk powder

53 " butterfat

20 " sodium chloride

Parke-Davis & Co. "Haliver" oil,

diluted 1:2 by volume with Wesson oil,

one drop twice per week.

This diet is essentially Sherman's Diet 16 plus oil.

High generation (80th) Sherman rats are being used.

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Three groups of animals will be used. One as above, one in which the butterfat portion has been irradiated in a Co<sup>60</sup> source (Dose  $3 \times 10^6$  r.), and the third with similarly irradiated butterfat plus 2 mg. d- $\alpha$ -tocopherol acetate in olive oil per week by dropper.

Breeding records as well as growth data are being taken, as previously.

Irradiation-induced oxidation of specific nutrients:

A detailed study of the mechanism of the irradiation-induced oxidation of ascorbic acid has recently been completed. By studying the rate of the oxidation in the presence and absence of oxygen, the the rate of oxygen consumption, it was possible to correlate the observed destruction with the ferrous-ferric dosimeter and establish a plausible mechanism for the reaction. A similar study is being carried out with N-propyl-dihydronicotinamide, with the hope that as good a correlation with the mechanism of radiation-induced oxidations of ferrous ion may be obtained. To date, the compound has been synthesized, and preliminary experiments to determine the rate of oxidation have been carried out.

Experiments of a similar nature are being planned for certain of the amino acids and fatty acids.

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