Table 2. PASSIVE PROTECTION OF MICE WITH TYPE-SPECIFIC (ABSORBED) ANTISERUM CONTAINING EITHER 1 OR 3 OR 2,4 ANTIBODIES

Sero-type of challenge strain	Antibody in serum	No. of deaths/No. challenged Exp. 1	2	3	4	5	Total	(%)
	(normal serum)	·	13/15	7/15	10/15	7/14	37/59	(63)
1,3	1	2/14	15/15	3/15	3/14	3/14	26/72	(36)
	2, 4	6/14	10/15	9/15	11/14	6/14	42/72	(58)
	3	5/14	3/15	2/14	7/15	1/14	18/72	(25)
	(normal serum)	·	·	9/14	10/15	8/14	27/43	(63)
1,2,4	1	·	·	1/12	0/15	2/14	3/41	(7)
	2, 4	·	·	6/14	4/14	6/14	16/42	(38)
	3	·	·	5/15	12/15	8/14	25/44	(57)

Considering the possible application of these findings to immunity in children, we direct attention to the fact that unabsorbed immune sera may contain much higher levels of type-specific antibody than of common (1) antibody[5,8]. A child immunized with type-1,2,4 strains may therefore develop very little immunity to type-1,3 infection. This may possibly account for the increase in the proportion of type-1,3 strains isolated in recent years[4,9]. Moreover, type-specific immunity may account for the different potencies of a single vaccine used in different localities[7], depending on the sero-type of the local epidemic strain.

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RADIOBIOLOGY

Irradiation of Fruit and Simultaneous Measurement of Respiration

FRUIT has often been irradiated for the purpose of examining the extension of storage life through control of infective organisms[1,2]. Fruit tissues, however, also lend themselves for studies in radiobiology; especially when high dose-levels are desirable to accentuate the primary cellular responses. Doses several orders of magnitude higher than those normally found to be lethal to animal systems can be tolerated by the fruit tissues, albeit with consequent manifestations of an altered metabolism.

The respiratory rate of the whole fruit serves as a measure of the metabolic response induced by irradiation. Limitations in the physical facilities have often necessitated a delay in the respiration measurements to various times after the exposure[3]. This may not only result in a misleading estimate of radiation response but also impose a severe limitation in studies of radiobiology where the critical need is to assess the initial radiation effect[4].

A recently installed 32,000-c. cobalt-60 facility designed by the U.S. Atomic Energy Commission to deliver a uniform dose of radiation under controlled temperature conditions has been adapted for the simultaneous measurement of respiration during the exposure period. This is achieved by attaching twelve air lines to a water-tight chamber into which the samples are placed to be lowered into the irradiation field. Air in-flow and return lines may then be attached to six containers of fruit and the respiratory rate followed with the standard Claypool–Keefer[5] technique. Temperature is normally maintained at 20° C, before, during, and after irradiation. Dose distribution as measured with Fricke dosimeters was found to be within ± 10 per cent with a dose rate of 295,000 rads per hour.

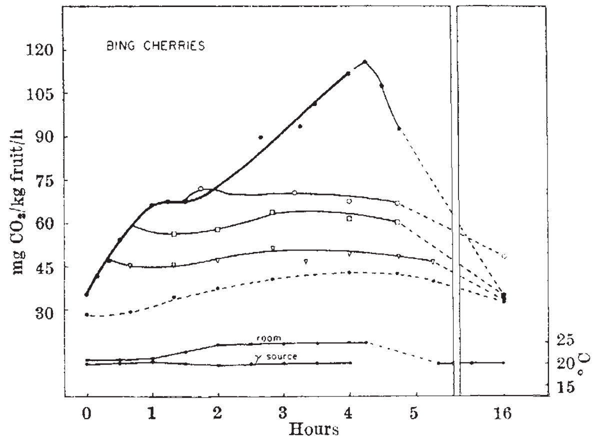

Fig. 1. Respiration of cherries during and immediately after irradiation. Simultaneous radiation and respiration period is indicated by the bold trace. ● - - - ●, Control; ▽ —— ▽, 100,000 rads; □ —— □, 200,000 rads; ○ —— ○, 500,000 rads; ● —— ●, 1,000,000 rads

An example of fruit respiration during irradiation is that elicited from Bing cherries as indicated by the bold trace in Fig. 1. The respiration rate rises with increasing dose excepting a plateau area near 500,000 rads. It is of interest to note that fruit receiving doses above the plateau-level decrease faster in post-irradiation respiration in contrast to the fruit receiving lower doses. Similar responses have been observed for oranges and lemons but with differing transition or 'plateau'-levels of irradiation. As a possible explanation of this effect one may assume that the higher doses cause irreparable damage to the respiratory mechanism, whereas at lower doses the resultant stress elicits a continued, elevated respiration commensurate with repair reactions. Experiments now in progress are directed towards the discernment of some of the intracellular changes which underlie this metabolic response.

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Increase of Strontium-90 and Cæsium-137 in Japanese Leafy Vegetables due to the Russian Nuclear Tests, 1961

FALL-OUT radioactivity derived from tropospheric origin was detected soon after the Russian nuclear tests of September and October, 1961, in the northern hemisphere. Contamination of milk and fresh vegetables by short-lived radionuclides such as iodine-131, zirconium-95 and ruthenium-103 was reported in Japan[1].

In the case of strontium-90 and cæsium-137 also, fresh leafy vegetables are fairly sensitive to reflect a change of contamination-level because of their direct foliar uptake of radionuclides besides root absorption from soil. Spinach, cabbage, hakusai (Chinese cabbage) and some other kinds of leafy vegetables were sampled from about ten locations widespread over the country in May–June (before resumption of tests) during October in 1961, January and March in 1962. These samples were analysed for strontium-90 and cæsium-137 by the fuming nitric acid separation method and dipicrylamine–cæsium chloroplatinate method respectively.