

INTERDEPARTMENTAL COMMITTEE ON RADIATION PRESERVATION OF FOOD

Minutes of Meeting
November 24, 1959

1. Time and Attendance

The ninth meeting was held on November 24, 1959, from 10 A.M. to 12 noon, in Room 4827, Department of Commerce, with Mr. H. B. McCoy, Chairman, presiding. Agency representatives from Army, AEC, HEN, Agriculture, Interior, ICA, State, SBA, the Department of Defense, and Commerce were present.

2. Summary of Program Activities

The Chairman opened the meeting by calling for agency representatives to furnish the Committee a brief status report of their agency's radiated food program. A digest of the information supplied follows:

a. Army

The Army on October 22, 1959 decided to defer plans for the construction of facilities at Stockton, California. The two reasons for deferment were: (1) lack of economic and logistics advantage; and (2) biologic problems that developed from the long-term feeding studies. Future Army plans include requests for funds (FY 61) to continue research and to continue wholesomeness studies. The Army has requested OQMG to make a comprehensive study on the economic and logistic support of radiated food and just where such processed food fits into the logistical pattern for the Army, Navy, and Air Force. The OQMG has been requested by the Army to furnish a tentative research program for the immediate future. In substance this tentative program includes:

(1) Policy - Army research program represents military needs. Army will cooperate in every way possible with other organizations, particularly with agencies fostering the nation's Atoms-for-Peace program. Army will continue to emphasize the cooperation of private industry through the medium of this Committee and the Department of Commerce inasmuch as the military will depend upon the civilian production base to meet military requirements. The Army will not be responsible for the nation's Atoms-for-Peace program. If this spearheading can be phased into another agency, Army will aid in such a transition.

(2) Objectives - The tentative six year Army objectives are to:

- (a) Complete its scheduled wholesomeness program.
- (b) The Army will not use irradiated food without FDA clearance for civilian use.
- (c) Food items (tentative) in six-year program are in first group - sterilized beef, pork, ham, and chicken. They may be raw but probably blanched.
- (d) Work these formulation component foods into rations such as sandwiches and meat components.

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- (e) Complete integrated subsistence military feeding complex which would include dehydrated, irradiated, and other foods.
- (f) Conduct logistical, operational, and economic analysis.

This tentative objective Army program has not as yet been commented upon by other agencies.

The Army Surgeon General's Advisory Committee met on October 8, 1959 and reviewed the program to date, including inspection of all reports submitted on the work conducted over the past several years. The Advisory Committee decided the present evidence justified the continuation of the study of irradiated foods, but additional research was necessary. These are several findings that have shown up in these wholesomeness studies:

(1) Reproduction activities of the dogs that have been fed irradiated pork and beef. The dogs fail in conception, with only about a 50% conception rate from which only about 50% of the pups live. Reason for this cannot presently be found. Continuation of study in this area on a three-year basis with an attempt to analyze the factors involved in this reproduction failure has been discussed.

In some of the earlier work when 35% spinach was added to the diet of rats, they died. Investigation proved death to be from oxalic acid poisoning rather than from any effects of irradiation. When the oxalic acid effects were eliminated, the spinach did not show any deleterious effect. The dilution with some of these irradiated foods lowers its caloric growth content. These things, of course, show up in the course of time, and the Army is trying to redesign the experimental approach to get around this perversion in the diet and avoid the secondary effects.

(2) There are certain things that do happen to the foods. There is a rather remarkable loss of vitamin and the tocopherols -- vitamin "E" and the tocopherols -- and a fairly extensive destruction of the vitamin "B-1" and the pyridoxines.

Unless the rations are fortified, again the feeding results are distorted.

(3) Other things have shown up which may be due to this destruction of the thiamine and pyridoxine. In one group of experiments, the mice developed great, big dilated auricles. The reason for this is not known, and this work is being pursued. Our feeling at the present moment is that this is probably not related to the irradiation but is related again to some perversion in the balance of the diet created by the attempt to introduce such a high percentage of the irradiated foods into the mixtures.

Army has run into the same thing with one group of rats which has developed congenital blindness. Again, this is probably related to some of the destruction rather than an inherent toxicity produced by radiation per se. This is being pursued further.

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(4) One of the things that does develop is that there are certain changes in the enzyme systems that occur in the second and third generation of rats fed the irradiated foods. This is apparently tied in with this vitamin "K" defect which has shown up in some of the work, the so-called "hemorrhagic syndrome" where the male rats living on irradiated beef died of hemorrhage very quickly. This was a vitamin "K" deficiency which is being investigated.

These are problems in design. These are problems inherent in the destruction of certain of the nutrients which take place.

(5) Army feels that with further investigation they can come up with the answers as to why these things have occurred and probably a solution as to means of avoiding them, but pending this solution long-term feeding to humans is not to be cleared.

(6) One of the knottiest problems is this question of induced radioactivity, and because of the technical problems that most of you are familiar with and most of the AEC people know more about it than we do, our present feeling is that we are clearing those foods which have been irradiated from the cobalt sources for human consumption.

(7) We are not ready to go along with feedings until we know the types of secondary substances, the half-life of these substances, and the other factors associated with it.

(8) The Surgeon General has a program going on now with the study of the gamma spectrum of the highly salted bacon where we know under certain conditions there is a measurable amount of induced radiation, and we are attempting to locate this by a gamma spectrum type of analysis.

(9) The Surgeon General is prepared to continue with the program and is actively setting up with our contractors the long-term feeding programs to ferret out the reasons for these defects which have shown up, and we await further advice about the secondary or induced secondary radioactivity which occurs under certain conditions of irradiated foods.

b. The Atomic Energy Commission

The AEC representative furnished two papers for the record. They were not read at the meeting, but copies are enclosed for review and are to be made integral parts of the minutes. The papers are entitled:

- (1) Statement by Dr. Paul C. Lebersold, Director, Office of Isotopes Development - AEC
- (2) Working Draft - Implementing the National Radiation Processed Foods Program including attachment 1 - (Plan for a National Radiation Processed Foods Facility)

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In effect parts of these papers suggest the Committee consider establishing an ad hoc work group to recommend to the Committee certain areas in which Government effort should be devoted in the civilian irradiated food program for the next few years. Further, consideration by the ad hoc group should include recommendations for a transition of the program into the civilian economy, if there is to be one.

AEC has had MIT make a study of the present status of fish irradiation. It appears at this time that fish is a likely candidate for radiation, because the organisms are quite susceptible to radiation. At least, they are not resistant. There has been demonstration of a considerable extension of shelf life which would be commercially valuable. This is one product that could be concentrated on.

c. Agriculture

Agriculture's representatives indicated they will pursue their basic research at about the same rate as in the recent past with the objective of finding out how, or whether, they can preserve quality in agricultural food products without producing deleterious effects or substances in those foods. The ultimate aim will be to proceed as these results permit, if practical aspects and if standards of healthy consumer products are reached. Agriculture's research is being conducted "in-house" and by cooperative contract work.

The lower rate of radiation application has more favorable results than higher rates of application. This is true particularly with strawberries and peaches, provided refrigeration is used. It is not visualized that the need for refrigeration lessens. These are technical comments and have no reference to the economics of the process. The information has been obtained with a source that is geometrically quite unsuited for the job. Agriculture is working with AEC regarding the acquisition of a more suitable source.

Another project supported by the military is the Poultry Research. Conclusions have been reached by persons working on this assignment that sterilization introduces an off-flavor so the product is not strictly comparable to fresh poultry. The avenue now being taken is to determine if canned chicken, sterilized by heat, would be more acceptable. The Army's changes in program have not or will not have any effect on Agriculture's program.

d. Interior

The Army program has made no changes in the Interior program. The Interior's program is now and has been in the past interested only in pasteurization. However, the main reason for Army's current program not making a difference to Interior is that funds are not currently available. It is hoped funds will become available so work can be resumed. Interior will follow closely the work that is being conducted by Army and others.

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e. Health, Education, and Welfare

It is believed important that the wholesomeness tests be applied to food items that are seemingly of importance and the ones under consideration.

f. International Cooperation Administration

There is nothing ICA is doing in this research field. The major interest will develop when the technical and economic studies are proved out. At that time the implications will be important. It is believed there will be a strong impact psychologically in under-developed countries if the United States becomes able to be the first to introduce a perishable food item such as fish in an area where refrigeration is very scarce.

g. Commerce - (National Bureau of Standards)

A paper discussing the dosimetry status was furnished the Secretary for inclusion in the Minutes. A copy is enclosed. A program on dosimetry, which is the basis for the physical measurements required, is in progress with hope of providing a National Standards Instrument.

SBA and State had no specific progress reports related to the program.

5. Concluding Business

It was unanimously agreed by members or their alternates or representatives that an ad hoc work group be formed immediately at the suggestion of AEC to perform the following:

- (a) Assess the current "state of the art"
- (b) Assess progress achieved in Government activities
- (c) Determine what problems or issues now need to be dealt with to advance the radiation processing of food
- (d) List specific areas of further research and development
- (e) Recommend how and in what way the future program in the Government may be administered; i.e., a single agency to be responsible for securing funds and allotting such funds to other agencies for activities over and beyond current basic activities of individual agencies
- (f) Make suggestions and recommendations regarding size of research and development program
- (g) Determine what, if anything, the Federal Government might do to encourage research and development by private firms, institutions, etc.

On the completion of the above outlined ad hoc study it will be submitted to the Chairman of the Committee on or about January 15, 1960.

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A Committee meeting will be called to take action on this report approximately ten work days after the Chairman receives the report.

Enclosures - 3

John Weber
Executive Secretary

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