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THE
NUTRITION OF INDUSTRIAL
WORKERS

SECOND REPORT
OF THE
COMMITTEE ON NUTRITION OF INDUSTRIAL
WORKERS
FOOD AND NUTRITION BOARD
NATIONAL RESEARCH COUNCIL

WASHINGTON, D. C.

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2101 CONSTITUTION AVENUE
WASHINGTON 25, D. C.

COMMITTEE ON NUTRITION OF INDUSTRIAL WORKERS

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INTRODUCTION

The National Nutrition Conference for Defense, held in Washington, May 26-28, 1941, recommended "that special attention be paid to the diets and nutrition of all workers in industry. . . . The pressing importance of this problem should be drawn to the attention of the governmental agencies concerned with defense industries. . . ." ¹

A survey of industrial feeding facilities, carried out by a member of the Milbank Memorial Fund under the auspices of the Food and Nutrition Board of the National Research Council during the summer of 1941, revealed widespread unsatisfactory dietary conditions in industry. Some of these findings were incorporated in the First Report of the Committee on Nutrition in Industry.² (This committee was subsequently renamed the Committee on Nutrition of Industrial Workers.)

As a result of the recommendations made in that report, together with those of the National Nutrition Conference for Defense, a section on Industrial Nutrition was organized within the Nutrition Division of the Office of Defense Health and Welfare Services in August 1942. In April 1943, the Nutrition Division was transferred to the War Food Administration. The industrial nutrition functions previously belonging to that division are now the responsibility of the Industrial Feeding Programs Division of the Production and Marketing Administration, U. S. Department of Agriculture.

The Food and Nutrition Board, through its Committee on Nutrition of Industrial Workers, has continued throughout the war period to provide authoritative opinion and quasi-official advisory service to the agencies concerned with the nutrition of industrial workers. This report is a part of the continuing program of that committee.

The objectives of the Government's industrial feeding program are "to provide the food needed by industrial workers to maintain the highest efficiency in production; to improve and expand industrial food services to provide for workers in all plants where in-plant feeding is practicable; and to provide assistance and advice to obtain the best possible use of available foods."

In carrying out this program the Department of Agriculture works closely with a number of Federal agencies. The various cooperative arrangements were formalized by the establishment in September 1943, of an Inter-Agency Committee on Food for Workers, consisting of representatives from the War Food Administration (subsequently merged with the U. S. Department of Agriculture), the Office of Price Administration, the War Production Board, the War Manpower Commission, the Federal Public Housing Authority, the Federal Works Agency, the Army, the Navy, the Maritime Commission, and the U. S. Public Health Service.

On October 4, 1943, the Inter-Agency Committee drew up a statement

of "Agreement Regarding Objectives and Responsibilities." The program includes:

"(A) Nutrition education conducted on a national scale as an integral part of the War Food Program, enlisting the cooperation of all Federal agencies concerned, State and local government agencies and nutrition committees, and labor, management, professional and trade groups, at all levels. Nutrition education should be conducted in all war plants. Nutrition education and in-plant food service operations should be integrated.

"(B) The establishment of food service standards to conserve food, equipment and manpower.

"(C) Provision of rationed foods for workers on the basis of OPA ration allowances to individuals and to institutional users, unless such allowances are insufficient to meet physiological requirements because of non-availability of non-rationed foods, increased need or any other circumstance making it impractical to meet requirements through an increased consumption of non-rationed foods. In such cases, supplementary allowances should be made on an institutional basis.

"(D) Maintenance of prices of prepared foods at reasonable levels.

"(E) Provision of materials, equipment and operating supplies needed for the feeding program. This involves the full use of second-hand and installed equipment.

"(F) Adjustment of manpower requirements for food services and for production of necessary materials, equipment and operating supplies, stabilization of employment in and training of employees for restaurants and in-plant food services where necessary.

"(G) Such other steps as appear necessary."

The U. S. Department of Agriculture (Industrial Feeding Programs Division) provides technical advisory service to labor and management, to other Federal agencies, and to state and local agencies and groups. It also serves as a "clearing house" for handling requests for assistance. It screens applications for facilities and brings trouble spots to the attention of the appropriate agency. Among Federal agencies, it has the prime responsibility for nutrition education programs in industry, and it has joint responsibility with the Office of Price Administration for the solution of food supply problems.

The procurement agencies and the War Production Board have varying responsibilities for ensuring that agreed-upon recommendations actually reach the stage of implementation. Of course, the final responsibility for the success or failure of the program rests upon labor and management. When these two groups are in agreement regarding what needs to be done and desire to see something done, there are generally no insurmountable obstacles.

To determine the extent to which in-plant feeding has developed under wartime conditions, surveys of feeding facilities in plants manufacturing war supplies were conducted by the War Food Administration during October 1943, and March 1944.⁸ The surveys indicated that 49 percent of these manufacturing plants had in-plant feeding facilities, but that the facilities were serving only 39 percent of the workers. The proportion of

plants which had food services varied directly with plant size. For example, 91 percent of the plants employing more than 2500 workers had some type of facility, whereas food services were available in only 28 percent of plants employing less than 250 workers. The larger plants employed 55 percent of the total number of workers reported in war plants. That there is need for expansion of food service facilities is indicated by the fact that only 45 percent of the workers in the larger plants were being served mid-shift meals.

The March 1944 survey indicated that 13 percent of the plants were planning new installations or expansion of existing in-plant food services. These additional facilities could provide mid-shift meals for 1,498,800 workers.

The proportion of workers in the ship-building industry utilizing food service was less than the average for manufacturing industries as a whole, while the situation in the aircraft industry was relatively good. Although 91 percent of the large shipyards had some type of food service, only 35 percent of the workers were being served mid-shift meals. Of the large aircraft plants, 97 percent had facilities, and 68 percent of the workers were being served.

Progress has been made in the field of education. Considerable material has been prepared specifically for the in-plant feeding program, both by the Government and by private industrial organizations.

The Canadian program for nutrition in industry parallels that of the United States. The Public Health Services of Canada under the Federal Department of Pensions and National Health established a Nutrition Service in November 1941, having among its primary duties the improvement of food services in Canadian war industries. Needed authority was later given through an Order-in-Council, which also provided penalties. Informal cooperation with other government agencies controlling expense, construction, materials, and food supplies was gradually achieved. A comprehensive industrial nutrition program has been developed consisting primarily of inspections followed by directions for improvements, including educational features of many kinds.

Contact is maintained with a majority of Canadian War Industries although many small industries are still being missed. The possibility of community groups assisting in conducting a nutrition program in one or more plants is being developed.

A profitable exchange of information with the United States has been maintained through the presence on this Committee of the Director of the Nutrition Service in Canada.

Important steps have been taken during the war to protect and improve the nutritional status of the industrial worker both in this country and in Canada. However, much remains to be done. Major tasks include: (a) the development of methods to provide adequate food for the millions of industrial workers for whom in-plant feeding is not considered feasible; (b) the solution of problems arising from congestion and inadequate community and home facilities; (c) the training and employment of more qualified dietitians, nutritionists, and managers for mass feeding services

and industrial plants (one of the most pressing problems existing is the shortage of such qualified personnel); (d) the adoption of satisfactory food standards by all food service operators; (e) scientifically conducted on-the-job studies on the relation of nutrition and nutritional factors to the health and productivity of the worker; (f) similar studies on the relation of nutritional status to toxic reactions in industry; (g) the development of effective techniques which can be applied by individual plants or local groups to make basic nutritional facts acceptable to the workers, and the general application of such techniques; (h) studies of the effect of food preparation and cooking practices used in mass feeding operations upon the nutritional value of the food, and practical recommendations on methods of protecting the worker from any loss of nutrients resulting from such practices.

The industrial physician should be assigned responsibility for the nutritional adequacy of the food service, as well as sanitary and bacteriological control. Acceptance by management of its share of the responsibility for the nutrition of its employees can hardly be expected unless the relationship between nutrition and health, morale, fatigue, industrial diseases, and accidents is understood by it.

In the years which have elapsed since the Committee's first report, additional data have been obtained on the extent of malnutrition among industrial workers, on the effect of malnutrition upon the quality and quantity of industrial production, and on the methods by which the nutrition of industrial workers can be improved. In the ensuing chapters, the evidence for the need for nutrition programs for workers and suggestions for their materialization are presented and discussed.

CHAPTER I

THE "WHY" OF NUTRITION PROGRAMS FOR WORKERS

THE PREVALENCE OF DIETARY INADEQUACIES AND NUTRITIONAL DEFICIENCIES, WITH PARTICULAR REFERENCE TO INDUSTRIAL WORKERS

Since the first report of this Committee was published (April 1942)² more facts on the diets and nutritional status of industrial workers have been made available. A survey⁴ by the Illinois State Health Department of 1102 luncheon trays in the cafeterias of four Chicago war plants revealed that only 8 percent of the workers chose adequate foods, 21 percent chose foods that were borderline in respect to adequacy, and 71 percent purchased totally inadequate meals.* Another interesting survey⁴ of the food selected in a 24 hour period by 1020 workers was made by a nutritionist for a large industrial research foundation. It was pointed out that 28 percent of the workers had no milk with any meals, 22 percent had no fruit, 44 percent no eggs, 77 percent no cereals, and 22 percent no green vegetables. It has been reported that a number of war workers (10 percent) in the San Francisco area often arrived at their work without breakfast.⁵ Of the breakfasts chosen, 64 percent were rated as poor, and only 14 percent as good.†

An appraisal of the contents of 704 lunch trays in one plant disclosed the following:⁶

	Good ‡	Fair ‡	Poor ‡
704 people	54 7.7%	219 31.1%	431 61.2%
467 men	43 9.2%	170 36.4%	254 54.4%
237 women	11 4.6%	49 20.7%	177 74.7%

* The meals served were scored according to the presence or absence of the following food stuffs: 8 oz. glass of milk or two foods made from milk, each equivalent to one-half cup of milk; three-fourths cup of green or yellow vegetables; one medium or two small potatoes; one serving of meat, cheese, fish, or eggs; two slices of whole-grain or enriched bread; one square of butter or fortified oleomargarine; and one of the following groups of foodstuffs: 4½ oz. of tomato juice, 4½ oz. of grapefruit juice or ½ grapefruit, one orange, 4½ to 5 oz. of raw cabbage or green pepper or a mixture of the two. If all of the food items were selected the luncheon was considered adequate. If one of the items was omitted, it was judged fair, and if more than one of the items were omitted the luncheon was judged poor or inadequate.

† The breakfasts were rated as good if the combination of foods included two of the following items: fruit, milk, cereal, ham or egg, and an additional food to supply 500 calories. A breakfast which had none of the above foods or supplied less than 300 calories was rated as poor and those who had no breakfast at all were rated in the "poor" class.

‡ The standards for the ratings were as follows:

"Good": Two-thirds or more of the Recommended Allowances for one meal, *i. e.*,

If a fresh vegetable salad had been added to the meals of those who did not purchase one, the results would have been as follows:

	Good	Fair	Poor
704 people	141	407	156
	20%	57.8%	22.2%

The meals of the men tended to be better than those of the women, mainly because the men ate more.

While no detailed nutritional studies of industrial workers have been undertaken in Canada, a dietary study⁷ carried out early in the war on families with less than \$1,500 per year income revealed that their food consumption was not satisfactory. It has been estimated that one-half of all Canadian families fall within this income group. More recently many surveys have been made of lunches and breakfasts eaten by workers in Canadian industries. The general results are illustrated by a lunch survey which showed that, out of 828 carried lunches, only 19 percent could be graded as good, while out of 1029 bought lunches 43 percent could be graded as good.* More than half of the people in each case had no milk to drink at this meal.

Apparently, good lunches are eaten by a greater proportion of workers patronizing cafeterias than of workers bringing packed lunches from home.

Perhaps the most accurate data on workers' diets were furnished by a study of the diets of about 1100 aircraft workers in Southern California.⁸ The weekly consumption records of selected foods indicated that over fifty-five percent of the diets were poor as regards green or yellow vegetables; nearly fifty percent were deficient in citrus fruits or tomatoes; thirty-three percent were poor in milk; and about twenty percent low in eggs. Practically all the workers consumed sufficient lean meat. Only 2 percent of the men had diets which met or approximated the Recommended Dietary Allowances of the Food and Nutrition Board, National Research Council;⁹ 11 percent obtained marginal diets, while 87 percent had diets which were decidedly unsatisfactory in one or more of the food groups.

Young men had somewhat better diets than older men. Men under 25 years of age drank more milk and ate more citrus fruits than those 25 years or older, but they all consumed about the same inadequate amount of green and yellow vegetables and of eggs.

An analysis of 250 two-day diet records indicated that 46 percent of the diets contained less than two-thirds of the recommended daily allowance for ascorbic acid. The percentage of diets that contained less than two-thirds of the recommended allowance for riboflavin was 43 percent; for calcium,

‡ of the Recommended Allowances for a day.⁷ A meal in which only one of the nutritive essentials was lower than two-thirds of the Recommended Allowance was classed as "good."

"Fair": Two or three nutritive essentials less than two-thirds of the Recommended Allowance for one meal.

"Poor": More than three nutritive essentials less than two-thirds of the Recommended Allowance for one meal.

* A lunch was rated good if it contained (a) a sandwich or plate lunch containing a protein food such as meat, fish, eggs, cheese, or beans, (b) a vegetable, other than potatoes, or a fruit, (c) milk, preferably as a beverage.

25 percent; vitamin A, 15 percent; thiamine, 14 percent; niacin, 7 percent; iron, 4 percent; protein, 1 percent. Of interest is the fact that nearly one-third of the men had a seemingly insufficient caloric intake. Obviously many workers are not adequately fed as judged by modern standards.

The same aircraft workers were given medical and laboratory examinations in order to determine their nutritional status.¹⁰ Their weight, according to height and age, was normal. Serum protein concentration was also normal. Nearly every subject showed either gross or biomicroscopic thickening, opacity, or localized elevation of the conjunctiva, lesions which are considered by some to be due to vitamin A deficiency.⁹

About 17 percent showed one or more abnormal neurological signs, such as absence of knee and/or ankle jerks, calf muscle tenderness, plantar dysesthesia, loss of vibratory sensation in toes to a C-128 tuning fork, signs which may be indicative of thiamine deficiency. It was observed that about 26 percent of the subjects had loss of vibratory sensation in toes to a C-256 tuning fork. This is generally accepted as pathological in men under 35.

Signs associated with riboflavin deficiency were found among these workers. Nine percent showed cracks or fissures at the sides of the mouth and scaly, greasy desquamation at the angles of nose and eyes. Twenty-three to forty-three percent showed ocular manifestations suggestive but not pathognomonic of riboflavin deficiency, such as lachrymation caused by light; eye fatigue or eyestrain; burning, itchy, or gritty feeling in the eyes; sensitivity to bright light. Nearly every subject showed some degree of corneal vascularity. However, it is questionable whether this can be interpreted as evidence of riboflavin deficiency.

As was to be expected from the dietary studies, niacin deficiency was reported in only 2 percent of the subjects.

On the other hand, in view of the low intake of citrus fruits or tomatoes, it is not surprising that 32 percent of the men had plasma ascorbic acid concentrations below 0.4 mg. per 100 ml., and another 20 percent below 0.6 mg. per 100 ml., indicating a low vitamin C content in their tissues. Eleven percent had hemoglobin values below normal.

A greater consumption of milk, citrus fruits or tomatoes, and certain green vegetables would correct the major dietary deficiencies of riboflavin, ascorbic acid, and calcium and raise the intake of most other nutrients.

A rigorously controlled large-scale experiment on the effect of a "vitamin-mineral" supplement on their industrial efficiency was carried out on these aircraft workers.¹¹ The study ran for a year from March 1, 1942, to February 28, 1943, during which time the men received a "vitamin-mineral" supplement in capsules and pills twice a day while they were at work, five days a week. The supplement contained:

Vitamin A	50,000 I. U.
Vitamin D	800 I. U.
Vitamin B ₁	10 Mg.
Vitamin B ₂	10 Mg.
Niacinamide	100 Mg.
Vitamin C	250 Mg.
Calcium (as Carbonate).....	500 Mg.

A conservative estimate of the over-all gain to production from the physiological effect of the "vitamin-mineral" supplement, after all psychological effects were eliminated, is 10.5 working days per man per year. This corresponds to a gain in manpower of 4.1 percent.

Of this total gain of 4.1 percent, 62.9 percent was due to better general work performance, reduced absenteeism contributed 21.6 percent, and reduced turnover 15.5 percent.

The percentage reduction in absenteeism as compared with that in the control group was 18.6 percent, in turnover 26.9 percent, and improvement in general work performance 2.6 percent. Although the last figure (expressed as a percent) is the smallest, the actual gain from improved work performance is greatest, as the percentage figure refers to all the workers, whereas in the case of absenteeism and turnover only a fraction of the total number of workers is involved.

The estimates of the results obtained are based on performance data and not on subjective reports of the subjects. The data are consistent in showing a physiological benefit from the "vitamin-mineral" supplement not ascribable to any psychological influence. The physiological and psychological effects were additive.

Definite evidence of a psychological effect was one of the interesting findings of the study. This effect may be attributed to the fact that the subjects volunteered for the test and knew that they were participating in a health study. By the use of appropriate controls it was possible to separate the psychological from the physiological effects. The psychological effect influenced only absenteeism. General work performance and the rate of turnover were not affected by it. It alone reduced absenteeism by 29.3 percent; the physiological effect caused an additional reduction of 18.6 percent in the entire group receiving the "vitamin-mineral" supplement, and from 11.7 to 35.5 percent in different sub-groups.

The psychological effect appeared very early in the study and diminished as the study year progressed, whereas the physiological effect built up slowly, was not manifest until four to six months, and then persisted until the end of the study year.

That nutritional deficiencies are prevalent among the people of the United States is strikingly brought out in the report of the Committee on Diagnosis and Pathology of Nutritional Deficiencies of the Food and Nutrition Board, National Research Council.¹² The report points out that most of the deficiency states are of the mild, moderate or severe chronic form, and because of their gradual development are frequently unsuspected.

These studies emphasize that a large number of industrial workers have multiple but mild nutritional deficiencies.

CAUSES OF MALNUTRITION AMONG WORKERS

Malnutrition exists in the working population chiefly because of inadequate income, poor food habits, unavailability of proper foods, physiological stress, which increases food requirements, and metabolic disorders and diseases that interfere with the digestion and absorption of foods.

1. *Inadequate income*

In a study conducted during 1935-36¹³ it was calculated that good nutrition generally could not be expected with a weekly food expenditure below \$2 per capita, and was not probable with less than approximately \$4. The food budget necessary for the average American family (3.8 persons) in 1935 was thus \$395 to \$790 yearly. If it is estimated that the food budget is one-third of the total budget, it appears that a family income of at least \$1200 was necessary on the average in 1935-6 before a family could purchase sufficient of the proper foods.

2. *Poor food habits*

Ignorance. Foods vary considerably in nutrient quality. Some foods that cost little may be nutritionally expensive and foods generally considered expensive may be nutritionally economical. A knowledge of foods that combine to give good nutrition at the lowest cost is necessary if a worker and his family are to be properly fed on a limited budget. Just as illiteracy in this country has been greatly reduced by universal interest in and support of education, so malnutrition can be significantly reduced by mass activities to educate the people to select the proper foods.

Indifference. Many workers have the money and enough knowledge to enable them to buy a good dietary and still fail to be well nourished because of their indifference. It is indifference that prompts a worker to rush through a breakfast of doughnuts and coffee when he knows that a leisurely meal of fruit, cereal, eggs and enriched bread is what he needs; indifference that allows a young woman to lunch on a soft drink and candy when she knows that milk and a nutritious sandwich would be beneficial; indifference that permits a housewife to serve the workers in her family an overcooked, drab dinner when she knows that overcooking impairs food values and that a selection of a variety of attractive, nutritious vegetables, fruits, and meats, fish or eggs is required.

Improper selection and preparation of foods. Good nutrition consists of consuming all essential nutrients in amounts adequate to promote the best growth, development, and maintenance of the body. If the intake of any nutrient is habitually insufficient, the functioning of several organs may be impaired. If one nutrient is not adequate, this may also interfere with the functioning of other nutrients in the body. The selection of a nutritionally balanced dietary is thus of great importance. Nutritional status has an important bearing upon resistance to disease. For example, a direct correlation between the dietary intake and body stores of protein and antibody formation has been demonstrated in the experimental animal and there exists presumptive evidence of a like relationship between protein nutrition and acquired immunity in man.¹⁴

During recent years it has been shown repeatedly that the nutritional value of food declines during transit from the farm, storage at the market, and preparation in the kitchen. During the canning, processing, and refining of foods, and even while standing on the pantry shelf, food values are lost. One can get better nutrition by using whole grain or enriched

staple foods, by choosing vegetables that are fresh or properly canned, by using a minimum of water in cooking, by consuming the pot liquor of vegetables in a soup or gravy, by cooking rapidly, and by consuming foods soon after cooking.

The nutritive values of foods served in cafeterias are generally lower than those of home-prepared foods mainly because cafeteria foods are frequently cooked longer and stand longer after cooking. Goodhart¹⁵ has calculated that between 36 percent and 92 percent of the thiamine content and between 30 percent and 82 percent of the ascorbic acid content of luncheons were lost during preparation and service in the cafeteria of a large war plant. Nagel and Harris¹⁶ measured losses as high as 95 percent in the ascorbic acid and thiamine content of vegetables during cooking and service in a cafeteria. The average losses of ascorbic acid were 45 percent during cooking and another 30 percent on the steam table, while the losses in thiamine averaged 35 percent during cooking and another 35 percent on the steam table. In another large industrial cafeteria, the losses in vitamins in vegetables under actual operating conditions ranged as follows: thiamine 16-64 percent, niacin 2-61 percent, riboflavin 22-45 percent, and ascorbic acid 27-90 percent¹⁷. A number of investigators have found losses of nutrients from foods varying with methods of preparation, cooking, and service.^{18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28}

It is evident that the losses of nutrients from foods cooked in large quantities in the customary manner may be very high. Some losses can be avoided by eating certain foods raw; some can be minimized by reducing the cooking time and by serving promptly. Some losses cannot be avoided.

3. Availability of food

A shortage of labor, container materials, and transport affects the distribution of foods and influences civilian consumption. Fortunately nutritive essentials can be supplied by so wide a variety of foods that, in most instances, other foods can be used as alternates for those that are scarce.

The diets of many workers suffer because of the non-availability of proper eating places in or adjacent to the workers' places of employment.

4. Physiological stress and metabolic disorders

Even when the dietary is adequate, it is possible for malnutrition to develop. This "conditioned malnutrition"²⁹ is the result of interference with the ingestion, absorption, or utilization of the nutrients of food, or is caused by factors that increase the requirement, destruction, or excretion of these nutrients. Disorders of the gastro-intestinal tract and of the nervous system, allergy to food, loss of teeth, pregnancy, and therapy may each interfere with ingestion. Strenuous physical exertion, hot environment, fever, pregnancy, lactation, and certain therapies may increase the nutritive requirements. Gastro-intestinal disease, biliary disease, vitamin deficiency, and therapy may interfere with absorption. Liver dysfunction, hypothyroidism, malignant growths, and special therapy may interfere

with utilization. Diabetes, lactation, excessive perspiration, and therapy may increase excretion. Gastro-intestinal conditions, poisoning, and special therapies may increase destructions of these nutrients.

Thus heavy work, exposure to toxic substances, disease, and the treatment of disease may increase the requirement for some nutrients to an extent where even a good diet may not be sufficient to prevent the development of mild, or even severe, nutritional deficiency disease.

CHAPTER II

APPRAISAL OF THE NEED FOR A NUTRITION PROGRAM, AND OF ITS EFFECTS, IN AN INDUSTRIAL PLANT

THE VALUE OF DIETARY SURVEYS

Dietary surveys in industrial plants can be useful in ascertaining the need for remedial measures such as in-plant feeding installations and educational programs. The dietary situation may vary within an area according to the nature of the employee population and the size, location, and type of work of specific plants.

An adequately publicized dietary survey is a very effective method for stimulating the interest of industrial workers and management in dietary problems and in nutrition in general. Many people are unaware of what they have been eating until the facts are set down on paper before them. By actively participating in the survey they become interested in their food habits.

Through a dietary survey, a reliable picture of a prevailing food pattern or patterns can be obtained, providing the basic information for a nutrition educational program and for the improvement of in-plant feeding facilities. For example, dietary surveys in plants in different parts of the country have shown the frequency of poor breakfasts, thereby demonstrating the need for providing adequate breakfasts in plant cafeterias. Another survey showed that the caloric intake of 20 percent of the workers in one plant was habitually less than 2,000 calories daily. In one plant in Southern California a survey revealed that 40 percent of a group of adequately paid, intelligent young men ate no citrus fruit or tomatoes. In another factory, the dish most frequently bought in the cafeteria was chili beans; very few of the workers bought vegetables, which were badly overcooked. Inquiry revealed that vegetables would not have been bought in significant amounts even if they had been properly cooked. The chief reason for the failure to choose vegetables lay in the poor dietary habits of the workers, which an educational program would strive to change.

In one institution, a short dietary survey revealed that there was an over-consumption of meat; in another, the consumption of milk was far above the optimum amounts recommended by nutritionists. The changes made, following the surveys which required only a few days, saved these institutions between \$30,000 and \$40,000 annually and contributed substantially toward intelligent conservation of foods in short supply in the community.

DIETARY SURVEY METHODS

Care must be taken to minimize the amount of work and personnel used in dietary surveys, as in all other activities only indirectly associated

with production. The following methods provide useful information, and require a minimum of time and manpower.

The quantities of the different kinds of food served can be obtained from the records of the in-plant feeding establishment. These, divided by the number of meals served or workers fed, give not only an over-all picture of dietary patterns, but also many details. Similar information can be obtained from canteens and other auxiliary eating facilities.

Information thus obtained should be supplemented by studies of the contents of trays. These can be made conveniently by a person located at the cash register and provided with a tally sheet.

By going through a plant at meal time one can learn quickly the composition of lunches brought from home.

Surveys of the dietary pattern in a given plant should include the following additional data: the percentage of workers who use in-plant feeding facilities; the availability and type of food-service facilities in the plant; and the percentage of workers who obtain box or other lunches from commercial sources operating near the plant. The composition of such lunches should be checked. This information can usually be obtained from the vendor, but it should be verified by direct observation.

It is highly desirable to have the daily meal pattern. The patterns of not less than two and preferably five working days should be obtained. The practical method of getting this information is by direct interview. Experience has shown that it is unsatisfactory to ask a worker to fill out a questionnaire himself. If the questionnaires are sent out the return is usually both poor and unreliable.

The interviewer who fills out the questionnaire should be trained, and should have the assistance of food models to refresh the memory of the person interviewed regarding sizes of portions eaten. Interviews, to be well done, require at least fifteen minutes and need not take much longer. If an appointment is made several days in advance and the worker is asked to record the food he eats during the intervening days, the record will be more accurate and the time required for the interview will be shorter.

Below are two forms which have been used extensively in dietary survey interviews. The first form is used to record in detail the kinds and amounts of food eaten during the two days immediately preceding the interview. (Few people can remember all that they have eaten farther back than two days.) The other form gives the dietary pattern for a week. Only the kinds of food eaten are to be recorded on this form (except in the case of milk and citrus fruits). When filling it out, it is good practice to ask about all the breakfasts first, then the luncheons, and then the dinners; while breakfast will be nearly the same every day, the other meals will vary.

SURVEYS AND STUDIES OF NUTRITIONAL STATUS OF THE WORKERS

With the exception of a few regions where severe and acute deficiencies of the B-complex vitamins are endemic, the incidence of acute, severe nutritional disease in this country is low. Every physician, industrial or otherwise, should be competent to diagnose and treat severe and/or acute nutritional deficiency diseases. Persons manifesting them should be de-

DETAILED DIETARY RECORD FOR TWO DAYS

Name..... Survey No.....

Date..... Recorder:.....

DIET RECORD FOR: YESTERDAY..... DAY BEFORE YESTERDAY.....

Breakfast: Hour.....		Meal at work (or Mid-meal*) Hour.....	
Eaten at "home"..... "Out".....		Carry lunch..... Buy extras†.....	
Buy all.....			
FOODS EATEN:	AMOUNT:	FOODS EATEN:	AMOUNT:

Other Meal: Hour.....		Food and Drinks between meals:.....	
Eaten at "home"..... Bought "out".....		At the plant:..... Amount:.....	
FOODS EATEN:	AMOUNT:	FOODS EATEN:	AMOUNT:

At other times:

* Mid-meal for Sundays and other days not at work.
 † Enter "B" before specific food items bought to supplement lunch box. Describe here any special eating situation.

WEEKLY DIETARY PATTERN

Name:..... Survey No.....
 Date:..... Recorder:.....

FOOD HABITS AND LIVING CONDITIONS

Did you have citrus fruit today?..... Kind and amount..... Hour.....
 Are the 2 days reported typical of your diet?.....
 Are they *usual* as to *amount* of food eaten?.....
 Do you take any "tonic" or vitamins other than those given by the study?.....
 If so, what do you take?.....

FOODS EATEN IN 5 DAYS PRECEDING 2-DAY PERIOD*

Milk (glasses)					
Eggs—number					
"Dark" bread—kind					
Breakfast cereal— kind					
Potatoes— specify sweet					
Vegetables					
Vegetables					
Salads—content					
Citrus fruit— amount juice					
Other fruits— raw or cooked					
Liver, kidney, tongue, heart					
Meat, fish, fowl					
Cheese—in sandwich or piece					

Married: Wife (or family) with you.....Have hskpg. quarters.....
 Room(s) only, no kitchen.....Eat at boarding house.....Live there.....
 Eat at restaurants.....Remarks:

Single: Live with relatives.....Usually eat with them.....Rent room.....
 Eat same place.....Board different place.....Eat at restaurants.....
 How far from work do you live?.....Time to get there.....
 Usual hours of sleep.....

* Type only, except where indicated.

tected in the pre-employment and periodic medical examination. The problem of acute, severe nutritional disease is too infrequent and concerns too few cases to warrant special studies or even routine surveys in most industrial plants in this country.

On the other hand there is evidence that mild, chronic nutritional deficiency is widespread in this country and is found in all economic classes and occupational groups. Some students of the subject dissent from this view. Further study of the diagnosis of mild, nutritional deficiency states is required.

At the present time, the industrial physician need not be concerned with procedures such as biomicroscopic and dark adaptation examinations and the determination of vitamin levels in body fluids in routine pre-placement examinations. Pre-placement and periodic medical examinations should include appraisal of neurological status and the condition of the tongue, gums, teeth, and skin, in addition to the measurement of height, weight, and hemoglobin. This is not beyond the capacity of an efficient medical department.

Medical case histories yield useful information, if a dietary history is included. Dietary defects, especially if they are of long duration, may account for symptoms otherwise inexplicable. In this category are undue general fatigue, or fatigue of the eyes, a feeling of strain, and vague, but persistent, gastro-intestinal symptoms. Lassitude, apathy, a chronic state of "not feeling up to the mark" are common early signs in many chronic diseases, including nutritional deficiency states, although they are, of course, not pathognomonic of any one.

STUDIES ON THE EFFECT OF NUTRITIONAL SUPPLEMENTS

In planning a study of the effect of nutritional supplements or improved meals on nutritional status or on work performance the following are some of the basic considerations:

- 1) The study should be carried on for not less than one year and preferably for two years or more.
- 2) It must be rigorously controlled; there should be three groups: one group receiving the supplement (or improved meal), one control group receiving a placebo (or a meal as attractive as the improved one but unimproved in nutritional value), and a non-participating control group statistically comparable to the first two. The second control group is necessary to appraise the psycho-therapeutic effects of participation in a study *per se*. The psycho-therapeutic effects are real and of considerable magnitude.
- 3) The number of subjects at the beginning of the study should be so large that there will be not less than two hundred in each of the three groups at the end of the study. (It can be expected that, in any study of long duration, about one-half of the initial group will drop out before the completion of the study.) The difference between the three groups are apt to be small, and unless there are at least two hundred subjects in each group the differences observed are likely to be of low statistical significance.

Recently, there have been a number of studies in industrial plants of the effects of a vitamin supplement. In few of these has it been possible to be sure that all of the subjects took the supplement every day. Experience has shown that when direct supervision is not provided, the subject often does not take the supplement regularly.

In some studies, the questionnaire method was the only one used to determine the experimental results. Answers to questionnaires appraise subjective changes and are of value only when large, well-controlled groups are compared. However, improvement in the state of well-being is important and is often unjustifiably minimized in studies where only objective clinical and laboratory methods are used.

The results of dietary surveys in industrial plants and studies of the nutritional status of industrial workers should be directed toward formulating an intelligent remedial program, which should include educational procedures. Experience during the last few years has shown that, even where there are adequate in-plant feeding facilities, an effective educational program is necessary if the workers are to obtain maximum benefit.

CHAPTER III

SOME IMPORTANT CONSIDERATIONS IN THE DEVELOPMENT AND OPERATION OF NUTRITION PROGRAMS FOR WORKERS

VITAMIN-FORTIFIED FOODS: THEIR PLACE IN INDUSTRIAL FEEDING

In selecting the foods to be served in an industrial feeding establishment or elsewhere, the "basic seven" classification of foods proposed by the War Food Administration is a useful guide. When it is not possible to secure sufficient amounts of foods of a given group, nutritionally equivalent substitutes often are available.

There are some staple foods to which certain vitamins and other dietary essentials are now being added in accordance with principles and policies adopted by such agencies as the Food and Drug Administration of the Federal Government, the U. S. Department of Agriculture, the United States Public Health Service, the Food and Nutrition Board of the National Research Council, and the Council on Foods and Nutrition of the American Medical Association. Enriched white flour and bread and fortified margarine are examples of products most likely to be of interest to food management faced with the responsibility of feeding a group of industrial workers. Other foods, the fortification of which has received official sanction, are milk fortified with vitamin D, and iodized table salt. Iodized table salt is valuable as a means of assuring a higher intake of iodine in areas where simple goiter is endemic.

Enriched white flour and bread are required by Federal regulation to contain specified amounts of thiamine, riboflavin, niacin, and iron. Enriched bread, if properly prepared from enriched flour or in other ways, will contain amounts of thiamine, riboflavin, niacin, and iron that will help to ensure a satisfactory intake of these dietary essentials by the public, under the general food conditions which prevail in the United States.

Whole wheat bread, or bread made from so-called "high-extraction" flour, should be used if this is at all feasible. Where food habits militate against the wide use of whole-grain flour or bread because a preference for white flour and bread is well established, the food management should make certain that the white flour and bread offered in the plant are of an enriched type. Similarly, if various other cereal products are used, preference should be given to those of the whole-grain, enriched, or vitamin-fortified type.

It is pertinent to mention here that in England and Canada enriched flour and bread, such as have been developed in the United States, are not available. The Ministry of Food in Great Britain has chosen to meet this problem through the development and promotion of a high-extraction flour to which calcium is added but synthetic vitamins are not. The bread made from this flour is commonly referred to as "England's war bread." In Canada the use of synthetic vitamins in foods is not encouraged and is

actually forbidden by law in the case of flours and bread. Bread graded "Canada Approved" must be made from a flour specially milled to retain more of the vitamins and minerals, one specification being that it contain not less than 1.2 milligrams of thiamine per pound of white flour. When food services in industrial units and elsewhere are inspected by the Nutrition Services Division of the Canadian Department of Pensions and National Health, the use of this "Canada Approved" white bread as well as whole-grain breads is encouraged.

Edible fats entering into human dietaries are important not only as rich sources of energy but as carriers of fat-soluble vitamins. Butter is widely used as a "spread" on bread, rolls, crackers, etc., and is a source of vitamin A. Various combinations of vegetable oils and non-fat milk solids have been developed and marketed under the general name of margarine; their place in the dietary is similar to that of butter, and therefore their use is likely to increase when the supply of butter is small. When using margarine, the food management should see that the products selected are those fortified with vitamin A. Regulations of the Food and Drug Administration specify that such fortified margarines shall contain not less than 9,000 units of vitamin A per pound and any product claiming on its label to be fortified with vitamin A may be presumed to contain this amount.

Much research is being conducted on the preparation of mixtures of valuable foods which are available in considerable amounts but which are not used to the extent warranted by their nutritional value. Good examples of such foods are cottonseed flour, peanut meal, soybean meal, wheat germ, corn germ, and dried yeast. Some of the products made from these foods have been especially valuable for shipment in packages for war prisoners, for use in army rations, and for emergency feeding of the people of countries retaken from the enemy. It is pertinent to comment on such products here because their promotion for use in feeding industrial workers is usually based on claims made for high content of important dietary essentials such as proteins, vitamins, and minerals. If such products are offered for use in industrial feeding establishments, the food management should (a) weigh what nutritive and economic advantages, if any, such products have to offer over the use of available customary foods and approved substitutes for staples, as well as (b) demand scientific proof of the nutritive claims made for such products. This demand for proof is important because such products are the result of processing of some kind and it is well known that certain processes adversely affect one or more important dietary factors. Since rapid and inexpensive methods are now available for the assay of foods for vitamins, etc., the food management is not being unreasonable in insisting on scientific proof of the various claims made for a product.

THE USE OF VITAMIN AND/OR VITAMIN-MINERAL PREPARATIONS

All dietary surveys of industrial workers in the last few years have shown that the diets of the majority contain considerably less than the Recommended Dietary Allowances of one or more vitamins and calcium.

This situation could be improved by relatively small changes in the diets of most workers. For example, the survey of noon meals in one factory, quoted in an earlier section, showed that the inclusion of a raw vegetable salad would have reduced the number of "poor" meals bought from 61.2 percent to 22 percent; and would have raised the number of "fair" meals from 31.1 percent to 57.8 percent; and of "good" meals from 7.7 percent to 20 percent.

The situation could be further improved if industrial feeding establishments and workers at home were to use only whole-grain and enriched bread and flour, and fortified margarine when margarine is substituted for butter. The enrichment of cornmeal products would improve the diets of the workers in the Southern States.

None of the food enrichment measures in operation today can improve one of the most common of present dietary deficiencies, that of vitamin C.

Attempts to improve the diets of industrial workers by the use of vitamin-mineral supplements, if they are to be rational and effective, should be based on information regarding deficiencies in the diets of the workers; and the distribution should ensure that the workers ingest the supplement every day.

To obtain more definite information on the needs of specific groups of workers, a dietary survey should be made in each plant in which the use of a vitamin-mineral supplement is contemplated. Such surveys must be properly conducted and analyzed, preferably under the direction of the medical department, and the results should be used in assisting individuals in improving their eating habits.

The formula for the supplement should aim to raise the levels of the vitamin and mineral intake of the poorest-fed group of workers to the Recommended Dietary Allowances of the National Research Council.

The vehicle and method of distributing a supplement should ensure that all of the workers ingest it every working day. Experience has shown that where tablets or capsules are offered free to workers, even when left at the work bench, many do not ingest them every day unless consumption is actively encouraged every day. Many either forget to take them, throw them away, or take them home for a member of the family. The number of workers who use a supplement is still smaller when management merely offers it at cost.

A suitable vehicle for the supplement is a nutritious food. If such a food is attractive, a majority of the workers may be expected to look forward to getting it. The incorporation of vitamins and minerals need not affect its taste. The food base can supply additional nutrients, which are often needed. Indeed, in some cases, a food supplement may be found to make up the requirements, without fortification.

It is the opinion of some that workers will more readily accept vitamins and minerals when supplied in this manner as food elements (as distinguished from drugs or medicines) than when the supplement is given as a tablet or capsule, and hence will seek them in other foods. This might be expected to teach them a greater appreciation of the national food

enrichment program. There are, however, supplementation programs in which capsules or tablets are distributed and employee participation is high.

In using any supplement, suitable personnel and equipment must be provided so that there will be minimum interference with production and so that it is handled safely, cleanly, and expeditiously.

A rest period appears to be the best time for the distribution of a supplement, whatever form is used. Only a small fraction of the rest period must be required to obtain the supplement. The use of the rest period for this purpose has the additional advantage of encouraging the habit of eating during the rest period.

The distribution of a supplement in the form of tablets, capsules, or wafers requires less equipment and planning than does the distribution of food, but the cost of measures necessary to ensure that the workers ingest the supplement daily should be taken into account.

Wherever a supplement is used, it should constitute only one feature of the nutrition program, which should also include: (1) improvement of in-plant feeding facilities, and (2) an education program directed toward helping workers choose better meals at the plant cafeteria and at home.

When a supplement program is instituted, its purpose and composition should be explained to the workers. The initial announcement should state frankly that the purpose of the supplement and of the whole nutrition program is to improve the health and state of well-being of the workers; that the supplement is provided because the majority of our population have unsatisfactory diets, and that certain dietary deficiencies (calories, protein, and possibly minerals) cannot be made good by the supplement.

The daily ingestion of a supplement can be a daily lesson in the importance of good nutrition. The lesson can be made effective because it consists basically of doing something every day. It has been observed⁶ that when a supplement was provided under the conditions mentioned above, the workers were receptive to nutrition education. In some instances, they requested it of management. The quality of the meals bought in the following months at the company cafeteria improved noticeably; the workers selected more salads and more milk, and the total quantity of food bought increased. There is little danger, then, that workers will be satisfied with the supplement as a substitute for good meals. The educational effect of the supplement is analogous to that of the enrichment of flour and bread, which has made the public more conscious of the value of a good diet.

The use of vitamins in industry has been criticized on the following grounds: (1) It is of no value; (2) it entails a great waste of vitamins, because many people would receive more of some vitamins than they need; (3) vitamins should be taken only upon expert advice; (4) exaggerated claims in advertising lead people to expect greater benefits than they are likely to obtain; (5) vitamins in this form are expensive; (6) the vitamins used are synthetic, the inference being that synthetic vitamins are ineffective.

When the formula of the supplement is designed to meet common dietary deficiencies there can be no question of its value. There is little wastage of vitamins, since the appropriate formula contains only the kind and amounts of those vitamins and minerals necessary to raise the workers'

diets to the levels of the Recommended Dietary Allowances. In some cases unfortified foods might make up this difference. There is no evidence that the vitamins, in prophylactic amounts, are toxic. Sound educational campaigns would counteract exaggerated claims made in advertising and lead to a definite improvement in the diet of the worker and his family. The wholesale purchase of the necessary vitamins and minerals in large quantities makes them quite inexpensive. All the vitamins likely to be used in a supplement for human consumption are either obtained from natural sources (A and D) or are the synthetic forms (thiamine, riboflavin, niacin, and ascorbic acid) and are identical in every respect, i.e., chemical constitution, physiological and therapeutic action, with the forms in food.

IN-PLANT NUTRITION EDUCATION

The one thing which every industry can do, whether it be large or small, is to provide some kind of nutrition education. Industries have an excellent opportunity to disseminate information about human nutrition. Admittedly, the effects of an educational program are difficult to evaluate. However, it has been shown that a well conceived and well run in-plant nutrition education program, correlated with a progressive in-plant feeding program, can be very effective in changing eating habits. In a study conducted by the War Food Administration³⁰ it was shown that 60 percent of the industrial workers eating in the cafeteria in one plant manifested a change in food habits due to an educational campaign closely tied in with the cafeteria operation. At the same time, within this group, there was a carry-over of the effect of nutrition education into the home, to the extent of 24 percent of the group. Included in the War Food Administration's study were three plants which confined their in-plant activities to pamphlets or incidental posters, with very little effect on the eating habits of their workers.

There are two ways of teaching workers the fundamentals about what to eat and why, first by printed illustrative material for mass education and second by individual and group instruction. There is a wide variety of nutrition material available today at little or no cost.*

Bulletin Boards should be placed in strategic locations: rest rooms, hallways, elevators, and, of course, the cafeterias or dining rooms. Exhibits are one of the oldest methods of presenting nutrition material. These can be in the form of posters, miniatures, food models, actual food displays, color transparencies, or movies. A periodical employees' magazine or paper reaches the greatest number of people and is carried into the home where wives, mothers, children, and friends can read its messages.

Doctors, scientists, dietitians, and nutrition workers must do all in their power to combat the nutrition fallacies that abound over the ether

* From the Government, U. S. Department of Agriculture, and Consumer's Guide; from commercial organizations dealing with food or equipment that maintain Nutrition Departments for the purpose of disseminating material to the public, such as: the National Live Stock and Meat Board, National Dairy Council, Wheat Flour Institute, Poultry and Egg Association, Insurance Companies, Home Bureaus, Electrical Companies, and other similar organizations.

waves, in periodicals, and in papers. The government is making every effort to correct erroneous information and start people on a sound nutrition program that will build manpower, raise morale, and develop a country of strong and healthy individuals.

Diet Lists: Overweight, underweight, ulcer, bland, and high vitamin diets or others requested can be given out by the company doctor, dietitian, or nurse. A week's set of suggested menus for reduction and underweight diets has proven helpful. Diet lists should be simple; otherwise anyone attempting to plan a day's menu gets confused and does not quite know how to juggle the array of foods to form a balanced diet.

Motion pictures are effective, especially when they are in color. Fruit and vegetables in black and white are not as appetizing as when seen in their natural colors. In the last two years some excellent educational films have been produced and are available for use at little or no cost.*

Group or class instruction has been successfully used by telephone companies throughout the country. If the course is carefully planned and the right techniques of classroom instruction are followed, satisfactory results will be obtained. Furthermore, it is probably the most economical way to reach large groups.

Individual instruction, however, is the most effective type of nutrition education in industry. This necessitates having a nutritionist or dietitian on the medical staff who is a graduate of one of the accredited colleges approved by the American Dietetic Association and who has a background of practical experience in dietetics. To her the plant physician refers cases of underweight and overweight, and individuals suffering from those conditions in which diet plays an important part, such as ulcers, anemia, diabetes, and the nutritional deficiencies. Many employees are sent to the dietitian following the pre-employment examination. Referrals may also be made through other channels, that is, staff nurses, departmental supervisors, personnel directors, and other employees. In many instances the employee seeks out the dietitian because of some educational material he has seen.

In a private interview with the employee, the dietitian first takes a food history, sets the goal, and then prescribes the proper diet. She outlines the necessary steps to accomplish the desired results. She also touches upon the values in sufficient rest and exercise, proper daily health habits, freedom from anxiety, a positive rather than a negative mental attitude, and a determination to follow through to the end. This consultation lasts from fifteen to thirty minutes. Regular weekly consultations, varying from five to thirty minutes, are held for as long as may be necessary, and progress is noted each time on a chart which is always shown to the employee. The time interval between visits is gradually lengthened according to the progress made. Generally ten to twenty visits are necessary for the desired result.

The dietitian should be one who is able to deal easily and agreeably

* The "1,000 and One" Blue Book of Non-Theatrical Films may be secured from Educational Screen, 64 East Lake Street, Chicago, Illinois: This publication lists films and states whether they are for rent or for sale.

with people and to be interested in their welfare. Her primary job is to humanize the science of nutrition. To do this she must make the diet so simple that anyone can understand it. Above all, it must be practical.

Individual consultation helps to reinforce a lagging will. With the overweights this is most important. It is also important with the underweights, as they are often in a discouraged and rundown frame of mind and have, over a period of time, reached the conclusion that it is impossible for them to gain. They usually give a history of having "always been thin" and of having tried innumerable ways of gaining. They frequently are sure that they inherited their leanness and that it is natural for them to be thin, and are certain nothing can be done about it.

Any nutrition program that is to be successful must teach. It is best not to say too much and what is said should be readily understandable. Habits must be made over and this takes patience, understanding, and continued interest. If a person can be given a good answer to "What difference does it make?" he has been started on the trail of good nutrition. Most people are "appearance conscious," and if they know they can gain or lose and look better—that is motive enough. Many are also "health conscious." The satisfaction of following a diet and accomplishing the desired result gives the individual a sense of pride and satisfaction that is a great morale booster.

DIET CONSULTATION PROCEDURE

A. Referrals from:

- Pre-placement and later examination
- Nurses
- Personnel Division
- Shop stewards
- Foremen
- Other employees
- Employee himself, voluntarily

B. Routine Facts Determined:

- Weight
- Height
- Age
- Desirable weight (determined by physician after medical examination)
- Referred by

C. Additional Information Obtained:

1. Duration of:

- Overweight
- Underweight
- Health complaints such as
 - Ulcers
 - Diabetes
 - Anemia

- 2. Physician's recommendations and other pertinent data from medical history and examination

3. Food History :

Breakfast
Lunch
Dinner
Evening Snacks
Between Meals

D. Advice Regarding :

Prescribed Diet
Between Meal Feedings
Vitamin Therapy
Mental Attitude
Will Power
Rest and Exercise

E. Time Required for Consultation :

First Visit 15 to 30 minutes
Additional Visits 5 to 20 minutes depending upon degree of progress
and questions that may arise

F. Progress Record Charted

G. Periodic Consultations

Weekly return visits are desirable to keep the patient "in tune with his diet." Later, as his degree of will power is determined, the time can be adjusted accordingly, but, at the beginning, close track should be kept of his rate of progress.

H. Completed Record

John Jones :

Date	Weight	Height	Desired weight	Age	Referred by
4/3/44	212	6'	190	49	M. D.

Overweight 3-4 years. Feels fine but blood pressure slightly increased

Food History :

Breakfast—Cereal, 3 slices toast and coffee
10 o'clock—1½ Sandwiches
Lunch—1½ Sandwiches and milk or soft drink
4 o'clock—1 Sandwich and milk
Dinner—Meat, potato, vegetable, salad, 2 slices bread and butter, coffee, and dessert

Advised :

Diet to Lose Weight ; Vitamins

Result :

Lost from 212 to 183½ in 13 weeks. Stated he didn't realize how much bread he had been eating and is pleased with his "girlish" figure. Referred back to doctor for check-up; blood pressure now normal. After he reached 190, he felt that he would like to lose another 10 pounds to get rid of more of the waist line. The physician in charge agreed that this would be desirable. Feels fine now and is surprised how much he can eat and still lose.

The value of such individual education service goes far beyond the mere giving of information on proper food and diet. As good health habits

are interdependent, it offers an opportunity for a properly trained dietitian to instruct employees concerning their health in general.

It becomes increasingly evident, moreover, that other factors are playing a part in the employee's condition. Many employees suffering from emotional maladjustment show it by the symptoms of overweight, underweight, and other dietary abnormalities. An extremely underweight person is apt to be nervous or overly active or hypersensitive, perhaps bothered by insomnia or worried about himself or his family. Extreme overweight is no longer associated with a happy-go-lucky attitude toward life but instead may indicate emotional deprivations which cause the individual to nibble at sweets and overeat generally, thus compensating for a lack of the more lasting satisfactions. Ulcers, as is generally known, are found in individuals overly anxious and under great nervous strain. The employee is often unaware of the emotional factors that have caused his condition, but he is conscious of his reactions to the condition itself; for example, he is irritable, ashamed of being too fat or too thin, feels conspicuous, and is disturbed because of easy fatigue. Certainly all of these deviations from normal health and appearance bring discomfort if not actual unhappiness.

The emotional difficulty may be so deeply buried that only an expert should undertake its solution, but, if the dietitian is conscious of the part emotions play in nutrition, she is in a position to do a better job. She must be aware of this interplay between physical and emotional health, and actually it is in meeting many of the emotional needs of the individual that she makes her biggest contribution. At least some of these needs are met in the weekly interviews and the dietitian should be fully aware of what this means in the lives of the employees, many of whom thrive on attention and interest. The weekly report and charting of progress, the obvious interest of someone in his appearance, a sympathetic listener with whom to discuss problems, personal or otherwise, is most heartening and bracing to the employee. It boosts morale, brings to light inarticulate fears which, once seen, are not so frightening as when buried and neglected, and makes possible some solutions which otherwise might never have been found. These more intangible results of the employee-dietitian interviews are still to be explored, but they are implicit in this friendly relationship extending over several weeks.

Typical cases are as follows:

1. Middle-aged man recuperating from pneumonitis, wants diet to gain. He is nervous, unduly tired, fretful, and worried. Gained from 138 to 157 and felt much better.
2. Girl. Her boy friend was home on leave and told her she didn't look well and to gain some weight. Gained 10 pounds. Boy friend happy.
3. Man, aged 47, 5' 10½". Underweight all his life. Anorexia, insomnia. Gained from 119½ to 136. Still on diet.
4. Man, aged 52, slight heart condition so doctor advised a diet but "doubts" if he will follow it. Patient says he has been overweight from lack of exercise, but food history reveals he has never eaten

fruits and vegetables and dislikes them very much. Never drinks milk. Later: States he is eating vegetables "other than potatoes and baked beans" for the first time in his life. Has cut the beer down to 3 glasses in 3 weeks instead of 3 bottles a day. Has to admit that he feels better. His whole family are eating vegetables—"even the kid," who never used to. Lost 22 pounds. Blood pressure normal.

5. Man has weighed 129½ since 1935. When in the Army weighed 150. He is blue and discouraged. Wife died a year or so ago and his daughter goes out in the evening and then he gets lonely and he goes out too—and drinks—then gets tired from lack of sleep—vicious cycle. He has agreed to cut out the week-end benders and to "give John Barleycorn the slip" until he gains some weight. Last week he was "tight" most of the week-end—then couldn't sleep and couldn't eat. Later: Still depressed. Has moved to a hotel where he'll have regular meals and more rest. Has gained 5 pounds—feels much better, has stopped drinking. Later: Gained another 4 pounds.
6. Woman, age 39, height 5' 4". Has been out ill for several months, nervous breakdown. Says she is sure she can't gain any weight but will try. Gained from 99 to 110 in seven weeks. The next 5 pounds took several months.

The value of such a program in the field of industrial relations is obvious. The dietitian's interest in the employee should typify the company's genuine interest in him, thereby helping to make him a more contented person and a more loyal employee. Better health, both physical and mental, makes for greater contentment and raises the quality of work performed.

SUMMARY AND RECOMMENDATIONS

All dietary studies indicate that a large portion of the industrial population is obtaining an unsatisfactory diet.

Nutritional appraisal studies in recent years have shown that relatively few persons show evidence of acute, severe nutritional deficiency disease. However, signs and symptoms often associated with proven malnutrition are exhibited by many people in all economic, occupation, and age groups.

A proper diet consists of sufficient carbohydrate and fat to provide calories necessary for the work to be done, together with the needed protein, vitamins, minerals, and water, the whole properly distributed throughout the day. Vitamin and vitamin-mineral concentrates, while important when properly used, should not be regarded as substitutes for ordinary foods, but as supplements. When employed, supplements should be designed to raise the total dietary of the workers to the levels of "The Recommended Dietary Allowances" of the National Research Council.

Malnutrition may result from limited income, poor food habits, ignorance, indifference, and the unavailability of proper foods. Poor food habits, ignorance, and indifference are important causes of malnutrition in industrial workers.

Industry can do much to help combat malnutrition in workers by making

better food available at reasonable prices in convenient and attractive eating establishments.

If one is to enjoy optimal health through nutrition, foods must be properly processed, intelligently selected, and carefully prepared. Present practices in these three categories leave much to be desired.

Education on the proper selection, preparation, and consumption of foods is important in attacking the malnutrition problem. One must expect slow progress through education, primarily because food likes and dislikes are generally ingrained, being the result of custom, taste, and tradition. Unfortunately, mere knowledge of good nutrition does not make people give up bad eating habits or practices.

The Food and Nutrition Board of the National Research Council adopted, April 20, 1945, a "Recommendation for Peacetime Continuation of the Industrial Nutrition Program," which is subscribed to by the Committee on the Nutrition of Industrial Workers. The text of this recommendation follows:

"The Food and Nutrition Board of the National Research Council herewith brings to the attention of the Government the necessity for the continuation of a governmental nutrition program for industrial workers beyond the conclusion of the war.

"Considerable progress has been made in protecting and improving the dietary and nutritional status of industrial workers during the war period. This has paid dividends to the country in terms of health, morale, stability, economy, and production. The need for governmental guidance and assistance with nutrition programs for workers and their families will continue after the war. Many fundamental problems are awaiting solution.

"The objective of the peacetime program must be the protection of the health of the worker and his family. However, a further important gain from an effective program operated with this objective would be an increased and a steadier consumption of agricultural products, particularly those of high nutritive value, and greater returns to the producer.

"The program should be set up on a permanent basis and should be organized so as to provide the services of experts in the various phases of the problem to industry and labor. It is imperative that high professional standards be maintained by the Government in employing specialists in this field.

"The nutrition program should be integrated with other industrial hygiene and medical programs and should be developed in close working cooperation with State and local health agencies. Present State programs should be encouraged to continue, and programs should be instituted in those States now without them.

"The nutrition program for workers should be correlated with similar nutrition programs for other groups in the community.

"The development of effective educational techniques and the stimulating and sponsoring of research on food needs, food habits and the nutritional status of workers comprise two of the major components of the peacetime program. There is especially pressing need for reliable information on the contribution improved nutrition may make toward the protection of workers

exposed to industrial hazards such as toxic chemicals and adverse environmental conditions. The needs of women workers also call for particular attention."

The Committee further recommends that industrial establishments should, whenever possible, determine by surveys the need for supplementation of the workers' diets, taking into consideration the nature of the work performed and the possibility of exposure to injurious chemicals. Dietitians and nutritionists, in collaboration with industrial physicians, can conduct such surveys efficiently even among large groups of workers.

The Committee welcomes the opportunity to advise on the setting up and carrying through of controlled nutrition appraisal studies to determine the extent of malnutrition and to measure the improvement resulting from a nutrition program. The Committee will also welcome information on effective methods for carrying out nutrition education among industrial workers.

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