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INDUSTRIAL NUTRITION FOR DEFENSE

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Industrial expansion for defense, as for war, immediately involves shortages in manpower, which are reflected in the need for longer hours, a faster pace, more night shifts and the employment of an increasing number of women. These special conditions inevitably result in added physical stresses and strains. The physical needs of the body to withstand this additional strain may, in part, be met by having good wholesome food available in the plant. In industrial establishments, desirous of maintaining optimum production and good worker morale, serious consideration should be given to providing the best in-plant feeding facilities practicable. This need not necessarily be a cafeteria. A lunch counter or a rolling cart may, under certain circumstances, adequately meet the needs of the particular plant situation.

The foods served should be selected to provide maximum nutrition at low cost. Menus should be adapted to the particular type of feeding facilities available in the plant. They should be planned with an understanding of food values, good nutrition and a knowledge of the dishes which are popular with plant personnel. The foods served should present eye and appetite appeal. The menu should always include the standard basic seven nutrients required for good health, while consideration is also given to the caloric needs of workers — a higher calorie menu for those doing heavy work or working unusually long hours (3000 - 4000 calories per day); a menu of lower caloric content for workers on light assembly jobs or sedentary white collar workers (2500 - 3000 calories per day). A low calorie diet for workers is not to be confused with a reducing diet. In general, the food eaten during the lunch hour, in the plant, should provide 1/3 to1/2 of the worker's total food requirements for the day. Milk is always the beverage of choice,whether one is considering a high or low calorie menu, because it is an unusually nutritious food.

The menu is not only the bill of fare or list or dishes available to patrons; it also provides the basic pattern from which the food is purchased, prepared and served. The menu should be planned at least a week in advance; preferably two weeks ahead. When planning menus for industrial cafeterias or other in-plant feeding facilities it is necessary to be guided by the number of work shifts or whether the plant will be working overtime. Consideration should also be given to the season of the year, holidays and pay days. Experience has shown that during periods of heavy production or overtime work, and on pay day (particularly if the checks are cashed on the premises) the industrial feeding facilities are patronized more than on other days.

In plants where the majority of workers are engaged in heavy production, the caloric needs are high and should be met by properly planned menus offering hearty foods which will supply a high total caloric intake. This may be obtained by introducing into the menu, foods which are high in fats, starches, and sugar. Examples of foods high in fats are: fat meat or bacon; butter or margarine, gravies, mayonnaise or other salad dressings made with oil; and cream, either sour, sweet or whipped. Foods high in starches and sugars include such foods as: bread or bread products; waffles and griddle cakes; puddings, pies and other pastries; maple syrups, jellies, jams, preserves, sugar and candy. It is not usually sufficient, however, merely to offer the high calorie foods; portions must be large if a high total caloric content for the meal is to be obtained.

With increased hours of work, special attention should be given to mid-morning and mid-afternoon rest periods. Snacks delivered by rolling carts during these rest periods, or otherwise available to workers, will contribute greatly to reduction of fatigue and to increase production. The same principles apply to industries where heavy seasonal activities are the rule. The following is an example of a high calorie lunch menu:

Cream of tomato soup or other creamed soup
Roast pork or other fat meat, with gravy
Fried potatoes or candied sweet potatoes
String beans, carrots or other green or yellow vegetable
Waldorf or banana salad with chopped peanuts or mayonnaise
Bread or rolls with plenty of butter or margarine
Pudding with whipped cream or pie a la mode
Milk
Tea or coffee with sugar and cream or hot chocolate with whipped cream

The high calorie foods in the above are the creamed soups, fat meat with gravy, fried white or sweet potatoes, salad with nuts and mayonnaise,

pudding — preferably in such form that they may be conveniently taken away from the counter to be eaten at a nearby table or elsewhere. Limiting the menu in this manner will avoid the possibility of too many left overs. It will facilitate speed of preparation, thus making for more efficient use of limited counter personnel. It will also help the worker reach a decision quickly when choosing his noon day meal, thereby saving everyone's time including his own.

It is recommended that whenever possible a nutritious and low priced "Special Lunch" and "Special Snack" for mid-morning and mid-afternoon be offered and an effort be made to promote interest in it on the part of workers. The "Special" for the day may not realize a large profit, but the wise cafeteria manager knows that increased volume in sales can overcome this disadvantage. It is essential to add, at this point, that industrial feeding facilities should be operated primarily for the welfare of the worker rather than for profit. Nevertheless, the industrial cafeteria manager never wants to operate at a loss, if he can help it. Moreover, the extent of the subsidy required from management will often determine whether or not feeding facilities in the plant will survive. A particularly well thought out nutritious "Special" either for lunch or the mid-morning or mid-afternon "Snack" will be found to provide necessary volume of sales to make it practicable and at the same time give the worker good value for his money.

To help boost sales for such "Special" food offering, effective use can be made of nutrition education posters or other literature. Talks to workers on the subject are very useful.

For the "Snack Special" in plants having mid-day rest periods, many simple inexpensive combinations are possible. In general it is desirable to have it priced at no more than 12 cents, because in most industrial plants coffee and a doughnut are sold at that price. A snack combination consisting of milk, fresh fruit and a cookie can be sold for 12 cents. When featured it is a popular choice as against the less nutritious doughnut and coffee. Other snack combinations can be made up of (1) 1/2 pt. of milk and a sandwich of cream cheese on whole wheat raisin bread; (2) ice cream and a cookie or a simple ice cream sandwich; (3) 1/2 pt. of milk and a bag of raisins and nuts. With imagination many other inexpensive combinations can be devised.

The industrial worker during a period of rapid industrial expansion for defense, or for war, is called upon to make a supreme effort to achieve maximum production. To provide him with the best possible nutrition in the plant at the lowest possible cost is a vital contribution not only to his health but to the country's defense effort.

If the industrial cafeteria manager is not well versed in nutrition, as applied to menu planning and food preparation, he should not hesitate to seek advice or counseling on the subject. The nutritionist of Division of Industrial Hygiene of New York State Department of Labor is always available for such consultation, without charge.

DUST INHALATION IN RELATION TO PULMONARY DISEASE

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(Continued from the February 1951 Issue)

Specific pulmonary pathology has also been shown to be produced by exposure to fumes and dusts of certain of the metals, notably beryllium and cadmium. Both these substances actually are systemic poisons, but since industrial exposure to them occurs primarily by inhalation, the principal pathology is usually present in the lungs.

Beryllium is responsible for two types of respiratory diseases.[23] One is an acute inflammatory reaction varying from a mild pharyngitis or bronchitis to a massive pulmonary edema, which occurs principally among workers exposed to soluble salts in the beryllium refining industry. The other is a chronic pulmonary granulomatosis developing after a delay of several months to years, which occurs primarily among workers exposed to dusts and fumes of the metal, oxide, and certain complex silicates (fluorescent compounds). It is characterized by a nodular fibrosis giving a characteristic x-ray picture, and a diffuse thickening of the alveolar walls. The outstanding symptoms are dyspnea, fatigue, anorexia, severe weight loss and intractable cough. The mortality is high, and some degree of permanent disability remains among nearly all those who survive. Inter-relations between the acute and chronic forms, and the occurrence of an intermediate subacute type, indicate that they are probably all widely different manifestations of the same disease process.

The pulmonary pathology due to cadmium[24] is generally encountered when workers unwittingly create cadmium fumes without adequate protection: for example, in flame cutting or welding cadmium plated iron. It first causes a cough and dryness of the throat, which then progresses to severe constricting chest pain and dyspnea, dizziness, chills and prostration. The pathological picture is that of pulmonary congestion and edema, with interstitial pneumonitis, hemorrhage and cellular infiltration.

The term siderosis[25] has been applied to a benign pneumoconiosis due to exposure to dust and fumes of iron and its oxides, usually seen among hematite miners, welders and other iron workers. Pathologically, siderosis consists of a deposition of phagocytized iron particles distributed in nodular fashion along the lymphatics. Outside of the mechanical effects of excessive pulmonary accumulation previously discussed, its importance lies chiefly in the necessity of differentiating it from silicosis, with which it had frequently been confused in the past, particularly among foundry workers. The nodules in siderosis are more discrete and sharply defined on x-ray, and there is no tendency to confluent nodulation or hilar enlargement.

Organic Dust Diseases

A few materials of organic origin have been found to be responsible for specific types of pulmonary pathology. Notable among these is bagasse,[26] which is the residue of sugar cane after extraction. This material has been extensively used in the manufacture of insulating board and other building materials. It shreds readily when handled dry, with the production of a fibrous dust. A high percentage of workers exposed to these fibers have developed, after about two months, an acute bronchiolitis with high fever, extreme dyspnea, productive cough, weakness and weight loss. X-rays show scattered miliary shadows throughout the lung fields which may go on to a confluent pneumonia. The disease usually clears up, but may be fatal or result in chronic fibrosis or bronchiectasis.

Both acute and chronic pulmonary diseases have been reported among cotton workers. The former[27] consists of an acute febrile illness with productive cough and dyspnea, resembling an acute bronchitis. It usually resolves completely, but may occasionally result in a chronic bronchitis. It is believed to be due to the dust of the fungi or bacteria which grow on damp, unsterilized cotton. The chronic disease,[28] known as byssinosis, consists of a progressive fibrosis, usually associated with emphysema and bronchiectasis, which develops after many years of inhalation of cotton fibers. It is not yet known whether it is a specific fibrotic response, an allergic reaction, or the end result of repeated subclinical acute infections.

Summary

To summarize, there are a number of types of pulmonary pathology which can be caused by the inhalation of excessive quantities of particulate matter, varying from specific fibrotic reactions with a characteristic picture to an increased incidence of a form of pathology usually considered non-industrial in origin. Size, composition and structure of the particles are all factors determining the nature of the response. Pathological reactions generally result when the capacity of the filtering and phagocytizing mechanisms of the respiratory tract are exceeded. These reactions may be fibrotic, inflammatory, degenerative, allergic, carcinogenic or merely mechanical impairment of function.

The best known cause of pneumoconiosis is free crystalline silica, but amorphous silica, silicates, and even silicon carbide have been shown to exert deleterious effects. Coal dust, certain metals, and a few organic compounds, have also been indicted as the cause of specific lung pathology. A careful evaluation of both the clinical picture and the occupational history is necessary in every case of chronic pulmonary disease to rule out a possible etiological or aggravating factor in the patient's working environment, and to ensure an optimum prognosis by eliminating all future exposure to any harmful atmospheric agents found.

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