

DATA FOLDER

Irradiated **VITAMIN D MILK**



Compiled by

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Vitamin D Milks from the Health Officer's Standpoint

Dr. Shirley W. Wynne

Commissioner of Health, New York City, 1929—1933

I WAS especially interested in the address of our first speaker, Dr. Van Norman, particularly in his statement that the milk industry had gotten together and had cooperated in putting on one exhibit for the entire industry. And that it was one of the few, if not the only industry in the country, that had so cooperated. Your industry is to be congratulated upon that successful cooperation; and it is also to be congratulated upon the change that has taken place in its methods of advertising.

There are but few products which the health officer and the physician can advertise and which he does advertise constantly, and milk is the most important of these. Of course the health officer and the physician do not call it advertising. They confer upon it the high-sounding name of public health edu-

cation, but to the business man it is simply good advertising. Up to a very short time ago the milk industry did not take advantage of the tremendous amount of advertising that the health officer and the physician, and through them the school teacher, could do for your industry, and have already done for your industry with practically no assistance from you.

I was pleased to note as I came through the outer room yesterday, that you were no longer spending money to advertise the fact that milk is produced by cows by depicting some elegant specimens in barnyards so realistic that one could almost smell them, or in advising the public that milk is a baby food by means of pictures of beautiful, fat, rosy-cheeked infants drinking milk from a bottle.

I do not believe there was anyone in the public who did not know that cows produced milk and that babies drank it, unless perhaps it was the distributors who paid for those advertisements!

We are here today to discuss another important advance which has been made in the dairy industry—the production of Vitamin D milk.

Dr. McCollum has told you some of the reasons why Vitamin D is important to health. I shall, in the time allotted to me, endeavor to tell you some of the reasons why the health officer is interested in the production and distribution of Vitamin D milk.

Rickets is a nutritional disease which is caused by a lack of Vitamin D, calcium and phosphorous, or a lack of any of these three important factors in nutrition. Dr. McCollum has pointed out to you that the absorption or assimilation of calcium and phosphorus depend upon the presence of Vitamin D, and a proper balance between the amount of calcium and phosphorus and Vitamin D seems to

have a regulatory influence on this balance of these two important food elements.

Rickets is a disease of civilization. The savage does not suffer from rickets. He may die of starvation; he may die of pestilence, but he never is stricken with rickets. This disease is distinctly one of civilized communities, particularly of large cities. It is due to lack of sunshine and improper diet. It first made its appearance early in the 16th Century in Europe, and later in the manufacturing centers of Great Britain. Its cause and its pathology was not known until recent times. It is a deficiency disease. It is not necessary to describe in detail its symptoms. Suffice to say that it is characterized by improper or insufficient calcification of the bones of the body, which gives rise to the typical deformities of rickets. These deformities occur usually during the first two years of life. The very marked cases which we see very seldom today are those of the deformed dwarfs, but bow legs, flat feet, pigeon breast, and a number of other deformities caused by rickets are quite common.

There is another deformity that results from rickets, and of which the laity hear but little, but which is an important factor in causing the high maternal mortality of our nation. You may not know, but it is a fact that this great nation of ours has the highest maternal mortality of any civilized nation in the world. More mothers die in child-birth per one thousand births in our great United States than in any other civilized nation. Something like fourteen thousand women lose their lives each year from this cause in the United States.

Authorities have said that probably fifty per cent of these deaths are preventable. I should go further and say that if we could eliminate rickets practically one hundred per cent of those deaths could be pre-

vented. The deformities of the bones that occur in early infancy are responsible for the deformed pelvis of the mothers who die in childbirth.

So that you see the effect of rickets is far-reaching causing not only deformities but influencing in a very material way the mortality of child-bearing being responsible for many unnecessary deaths of mothers and of new born infants. Furthermore, rickets predisposes to the acute respiratory diseases, pneumonia and bronchitis; and indeed all those other diseases which gain access to the system through the nose and mouth. So there are many reasons why the health officer should be and is vitally interested in rickets and its prevention.

It is interesting to know that seventy-five per cent of the children with rickets are apparently well nourished. It is not the thin, scrawny child who shows the greatest evidence of the disease.

Rickets is a disease of the city, and it is a disease of the winter months. In large cities because of the tall buildings the ultra-violet rays of the sun do not reach the street level during the winter months. Furthermore, during the winter months in large communities and industrial centers the air is polluted with smoke and soot which filters out the ultra-violet ray.

Furthermore, as Dr. McCollum told you, we live indoors a great part of the time protected from the weather by glass windows which filter out these ultra-violet rays of the sun. So rickets is distinctly a disease with a seasonal prevalence which extends from the late fall through the winter to the spring, when again because there is plenty of sunshine and a lesser pollution of the air its prevalence falls.

Several years ago at a meeting of your organization held in Atlantic City I pointed out the reasons

why health officers are interested in the consumption of milk and milk products. Aside from their interest and responsibility in its safe production and distribution I emphasized the fact that milk and milk products contain the most available supply of calcium and phosphorus that we have. We know from the work of Dr. McCollum and others that calcium and phosphorus is essential for the building of sound bones and strong teeth. I told you in that address that we in New York had just estimated what it would cost to engage enough dentists and dental hygienists to repair the teeth of the children in the schools of our city. Mind you, not to do a permanent job, but to keep their teeth in fair repair.

The chief of the dental service estimated that it would cost approximately eleven million dollars. That is a great deal more than twice the total budget of the Health Department for all purposes.

If we can educate the public to consume sufficient amounts of milk so that they have an adequate supply of phosphorus and calcium and we can give them enough natural sunshine or artificial sunshine in the form of Vitamin D milk, we can insure the next generation of sound teeth, just as Dr. McCollum with proper feeding has been able to produce mice with teeth that will not decay. This regulation of the diet will place no additional financial burden on the individual or the family, because proper food can be bought as cheaply as improper food, and the bill in the sum of eleven million dollars will not be required for a dental sum.

For this reason, if for none other, health officers are vitally interested in milk and in Vitamin D. It is for that reason we are always ready to cooperate with you in promoting the increased use of your product.

Your product is one of the very few that the health officer can speak about with justification.

There are two methods of curing and of preventing rickets. There are two therapeutic agents—sunlight and Vitamin D. Sunlight is not available, as I pointed out to you, in the large communities, particularly in the northern part of our country, during the winter months. Therefore, we must turn to some artificial source of supply for our Vitamin D during this period of the year. Heretofore, cod liver oil has been a source most depended upon.

I do not need to tell you that the majority of the people do not like the taste of cod liver oil; and the majority of children do not like it. Those of you who are parents and have experienced the difficulty of getting children to take cod liver oil appreciate that the dosage is apt to be irregular. If the child can be given the necessary amount of Vitamin D with its milk, it will save anxious mothers a great deal of trouble, and the children will get their Vitamin D without the unpleasant taste of cod liver oil.

Dr. Hess carried on an investigation last winter in the City of New York in the baby health stations of the Department of Health. He discovered the very interesting fact that the Vitamin D in irradiated milk was more potent than the Vitamin D in cod liver oil, and if I remember rightly, fifteen times as potent as the Vitamin D in ergosterol or viosterol. In other words, that while a child may receive a much larger dose of Vitamin D in viosterol and that its tissues may be even more thoroughly saturated with Vitamin D, the clinical results obtained by these larger doses of Vitamin D in viosterol were not nearly so good as those obtained from much smaller doses, thirty to forty rat units of Vitamin D, in irradiated milk.

Therefore, if we can supply our children with Vitamin D in sufficient quantity in their milk to take the place of the sunshine which is absent during the winter months, and in place of the cod liver oil which most of them do not like and therefore receive in insufficient quantities and at irregular intervals, we will be doing a tremendous service to the people of this country.

Dr. Hess, in a letter which he wrote me sending me a copy of his report, said that he believed that irradiated milk was the best method of dispensing Vitamin D on a communal basis; that it was the most practical method available.

Also, it creates an additional selling point for the milk dealer, and to that we can find no objection. On the contrary, anything which increases the consumption of milk, and particularly if another vital food element is added to the milk, should be encouraged by the health officer. But I am opposed to the addition of concentrates of cod liver oil, or the addition of viosterol, to milk. Vitamin D milk produced by feeding cattle ergosterol or yeast, or by irradiating milk after it has been produced, is satisfactory to our Department. I understand that the latter method is the cheapest and best method of producing Vitamin D milk and of standardizing the dosage.

We are opposed to the addition of concentrates to milk because if that is permitted it will open up the opportunity for high powered selling organizations to add almost anything to the milk in order to increase its sale. In other words, it would permit making milk a vehicle for any drug or medicine he wishes to sell, and which he believes will enhance the value of milk in the eyes of the public.

So I believe that you are on sounder ground when you produce Vitamin D milk either by feeding your cattle irradiated food, by irradiating milk after it has been produced. The consumption of milk whether it be irradiated milk or not, is a matter of importance to you, to the dairy farmers, and the health officer, and to the general public. To the latter, because of its influence upon their health, and in the dairy territories, because milk and dairy products are the hub on which the financial wheel revolves. Dr. Van Norman has pointed out that not much has been said in the recent discussions of those committees which were seeking to stabilize the milk industry about increasing the consumption of milk, the emphasis has been placed entirely on controlling production. It is, of course, of the utmost importance to control production so that it shall not exceed consumption to such an extent that milk gluts the market. But important as it may be to control production it is more important to increase consumption by educating the public that milk is the most important food and should have an important place in the diet of everyone—adult or child. The farmer has been largely responsible for the chaotic condition in which the dairy industry has found itself because he has taken no interest in increasing consumption, and has without any thought of the public's desire or ability to purchase his product, gone on increasing his production. The farmer should realize that reasonable prices cannot be maintained unless production nearly parallels consumption. It is time for the distributor to explain to the public and to the farmer the cost of collecting and distributing clean pure milk in a safe way. I doubt that any of the public not intimately associated with the milk industry has any realization of the cost of

the equipment necessary to handle milk safely; nor do I believe that any of the public has any idea of the tremendous saving of life that has resulted to the public through the improvement in the quality of the milk supply.

Little more than thirty years ago in the City of New York the death rate among infants was two hundred fifty per one thousand births. Today there are but fifty deaths per one thousand births. The deaths from diarrheal diseases amongst children have been almost completely eliminated. Milk borne epidemics of the acute infectious diseases no longer occur. Milk borne epidemics of typhoid fever are past and almost forgotten history. It costs money to bring to the city clean, wholesome milk from an area, the radius of which is five hundred miles, but it pays in the saving of lives and the prevention of illness, not to mention the expense and anguish and suffering which such illness entails.

There is need of constructive advertising or of education, call it what you will, in the matter of milk. I will cite one example. You may remember, those of you at least from New York, that some three or four years ago I organized a campaign against fake reducing remedies, fad diets and quacks. This campaign was undertaken because the health of many people in the community was being undermined and permanently damaged by these fraudulent nostrums and unscientific diets.

The patent medicines fell into three groups: Those which stimulated metabolism because of the thyroid extract they contained and which caused the disarrangement of the glandular secretion of the body which led to permanent ill health.

Those which acted as cathartics which stimulated intestinal action, or peristalsis which hurried the

food through the intestinal tract, so that the person was unable to assimilate the food he ate because it was hurried too quickly through the intestinal tract.

The third group includes reducing salts, reducing creams and lotions, and what not, which can reduce nothing except the victim's pocketbook.

The diets which were popular at that time were harmful because they were not properly balanced because the persons who advised them had no knowledge of food chemistry or other physiological needs of the body. It is just as important that the person who is reducing have a balanced diet which includes carbohydrates, proteins, the protective foods, the mineral salts, and that only the proportion of fat in the diet be reduced so that the person may burn up some of his own fatty tissue as fuel.

In this campaign for safe reduction methods we repeatedly and continuously stressed the fact that milk was not a fattening food, but one of the greatest protective foods, and that therefore milk and dairy products should be included in every reducing diet.

The response to this campaign, you may estimate when I tell you, that within the first ten days eighty thousand requests for information were received. I am glad to see that you have adopted our slogan that milk and milk products should be included in reducing diets.

The large billboard poster which I saw in the adjoining room is the sort of constructive advertising that should be developed further. It is that sort of advertising that will increase the consumption of milk among adults. If we can increase consumption among the adults you may be assured that increased consumption amongst children will follow. And if we can accomplish that we will have a healthier

people with stronger bones and fewer teeth defects, and you won't have to worry quite so much about the control of production.

It must be evident to everybody, that in this present era of scientific labor-saving equipment it is possible to produce more whether it is milk or shoes, or any other commodity than we can consume, so that there must be some control over production in the future. But you in the milk industry are in an unusual position because you can "sell" the people an increased consumption of your product on the ground that it is essential to good health. And every health officer, every doctor, and every school teacher in the country will back you up.

Indeed it has been the work of health officers and of Departments of Education that have kept up the consumption of milk rather than the paid advertising

In the city of New York the consumption of milk was stepped up from 1928 to 1929 approximately 25 per cent. Even in the period of depression, the city showed an increased consumption of two per cent against the decrease of any community in the United States, reaching in some cities to more than one-third. I believe that the Department of Health and the Department of Education are entitled to a large part of the credit for that remarkable showing. In many of the schools of the city of New York nutrition classes for the children have been organized, and some of these classes have borrowed from Columbia University experimental rats which were fed on milk free diets, while others were fed on balanced rations including milk, so that they received the necessary amount of calcium and phosphorus. The children of these schools have had an opportunity to see for themselves the effects of a properly balanced diet upon the nutrition of these little ani-

mals, and to also see the effects of an improper diet upon them. They were made to realize that a proper or improper diet would have the same effect upon their health.

It has been that sort of constructive work which has increased the consumption of milk in the city of New York. With the return of prosperity people will have more money to spend for food, and it is not too much to expect, with the continuation of sound public health education that the consumption of milk can be increased until we have reached the goal of a quart per person per day.

In the development of Vitamin D milk you have rendered another service to the public. We in the public health service will endeavor to help you to market your product because of its great importance to the health of the public.

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IRRADIATED MILK

Scientific Opinion as Extracted from Published Papers of Authorities

Dr. Shirley W. Wynne,
Commissioner of Health,
New York City, New York

The progress made in the production of irradiated milk is another evidence of the intelligent interest of the Certified dairies and a valuable contribution to scientific infant feeding inasmuch as the required amount of Vitamin D is supplied without recourse to cod liver oil. By means of irradiated milk, we are able to supply the baby with its proper amount of Vitamin D in a pleasant form. May I say here that I do not believe in adding ergosterol to the milk in order to increase its Vitamin D content.

- Certified Milk, March 1933

Dr. Alfred F. Hess
New York City, New York

The Role of Activated Milk in The Anti-Rickets Campaign

.....it is increasingly evident that, from a communal standpoint, the best method of preventing rickets involves the use of some form of antirachitic milk, and furthermore, that we must draw a distinction between measures which are most suitable for the prevention and those most suitable for the cure of rickets.....In addition, milk has the distinction and advantage of being the food which contains calcium and phosphorus in the highest degree.

.....

Activated milk, in the fluid or dry form, possesses the advantages not only of providing an automatic method of preventing rickets and of supplying this essential factor in a medium rich in phosphorus and calcium, but, as, has been shown, it accomplishes this end by means of an exceptionally small amount of the anti-rachitic factor. In view of these important advantages I do not hesitate to recommend the general use of such milk for infants and children, especially in large communities.

- American Journal of Public Health,
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E. V. McCollum, Ph.D.,
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Where We Stand Now in Our Knowledge of Nutrition

(Should Adults Get Vitamin D?)

The question is now being frequently asked of me whether adults should take a source of vitamin D as a safeguard to physiological well-being. The only logical answer in the light of the available evidence is that there is little room for doubt that an additional source of the vitamin, especially during the colder months of the year affords a safeguard to health.

(Vitamin D and Teeth)

.....We believe we are now in a position to explain the incidence of tooth decay on a theory which involves a proper or improper quantitative relation in the diet of calcium, phosphorus and vitamin D.

There is a decided tendency of the pregnant mother to sacrifice herself for the preservation of her progeny when her diet is inadequate, she is far more likely to suffer decalcification during lactation when the demand for mineral elements and vitamins is far greater than during pregnancy. I believe no one alert to existing knowledge would hesitate now to state unqualifiedly that the pregnant and nursing mothers of today are generally getting too little vitamin D. If our studies and those of Mrs. Mellanby are as sound as we believe they are, they will afford evidence that in temperate regions people of all ages should take some source of vitamin D.

.....

(Vitaminized Foods A Step in Right Direction)

There is a new movement toward vitaminizing certain foods which form staple articles of diet for young and old. One manufacturer of bread is supplementing the baking formula with an extract of wheat germ to add vitamin B₁. Another is adding vitamin D to bread so that people of all ages will secure a proper quota of the substitute for ultra-violet rays. Certain dairymen are now feeding irradiated yeast to cows to put extra vitamin D into the milk to

provide special milk of infant feeding. These practices are a step in the right direction and we shall doubtless see an extension of such methods of improving of the staple foods which enter into the diet of everyone as time goes on.

(Vitamin D Not Poisonous)

.....It is very uneconomical to put large amounts of the vitamin in foods such as bread or milk, and so financial considerations alone would preclude the marketing of foods containing excessive amounts of it. However, all foods which are advertised at present as providing vitamin D, under the Steenbock patent, are under the supervision of the Committee on Foods of the American Medical Association, and all such foods are frequently assayed by animal tests to insure that they do not fall below the standard of furnishing at least the minimum therapeutic dose of the vitamin. There is not the slightest prospect that any of these foods or drugs will be marketed which will contain harmful amounts of the vitamin, both for the reason stated and because the process of manufacture of vitamin D is controlled by the Research Foundation of the University of Wisconsin under the Steenbock patent, and this Foundation is under the direction of competent scientists who may be counted upon to safeguard the health interests of the public.

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DENTAL CARIES AND VITAMIN D

Everyone appreciates that cavities in teeth are very common but it will be something of a shock to many to learn that about 95 per cent of the school children have dental caries, which is the technical term for progressive destruction of teeth substance. Accordingly, dental caries is probably the commonest of all difficulties which afflict civilized man.

In sharp contrast with this extreme frequency of dental caries among us, tribes which have little contact with civilization often have fine teeth.

Among civilized peoples dental caries have existed for centuries but even in early Egypt it was more common among the wealthy than among the poorer classes. Moreover, during the past fifty years it has grown much more common among our own people. Evidently along with the many good things connected with our civilization there is something which has reacted badly upon our teeth.

PROBLEM RECEIVING MUCH STUDY

As soon as the magnitude of this dental problem was recognized there began to be studies of it conducted by an increasing number of workers. In this way the various possibilities have been explored in the search for a cause. Work of this character has been under way in a number of laboratories for some years and reports of progress are increasingly frequent.

These studies have demonstrated fairly clearly that some of the earlier theories regarding the cause of dental caries were not well based. It is always helpful to know that a suspected cause is not responsible. Fortunately other studies have demonstrated that some suspected factors are really important in the development of this disease.

While there remains much to be learned, sufficient progress has already been reported to make it certain that vitamin D is a very important factor in preventing dental caries.

THEORIES REGARDING CAUSES

We are always seeking explanations for what we do not understand and usually the longer we are looking for the true cause the larger the number of theories which are offered.

FILTH

The earliest guess as to the cause of dental caries was that it was due to filthy conditions in the mouth. There did not seem to be an agreement as to what constituted filthy conditions there but many have the feeling that when matters are not right filth is the cause. Tooth brushes were the answer to this theory.

As a matter of fact the tribes which have the least tooth trouble are quite innocent of tooth brushes.

The function of tooth brushes was supposed to be the removal of remnants of food which had lodged about the teeth. The destruction of the teeth was attributed to the fermentation resulting from the decomposing food and particularly candy. Many is the child who has been cut short of his desired candy on the assumption that his teeth were being protected.

It is entirely possible that candy indirectly may have had a part in the destruction of the teeth because the use of candy before or during meals has decreased the amount of desirable foods which otherwise would have been consumed.

There are a number of reasons why it is desirable to free the teeth from remnants of food and the proper and moderate use of tooth brushes is helpful but it is now fairly

plain that such use will have little or no influence upon the avoidance of dental caries.

HEREDITY

Earlier, it was common to attribute many human ills to heredity. Instances are common where both parents and the children are outstanding in the extent to which their teeth are decayed.

In the case of natives with good teeth whose children came into civilization the resulting loss of teeth could hardly be charged to heredity. On the other hand, if bad teeth resulted from faulty diet, what could be more to be expected than that the parents and the children, who lived on the same diet should share in the destruction of teeth.

VITAMIN C

In advanced cases of scurvy the teeth are affected and it was to be expected that dental caries should be attributed to lack of vitamin C in the diet.

A study of the effect of vitamin C on tooth decay was reported by Dr. E. C. McBeath¹ as follows:

"We also conducted an experiment to determine, if possible, the specific relation of vitamin C to the control of dental caries. This experiment was conducted at a state institution for children designated as Home L.

"One hundred fifty-two children were selected, eighty-eight in the control group and sixty-four in four experimental groups of sixteen each. This experiment was conducted, uninterrupted, for nine months.

"The large control group was kept on the un-supplemented regulation diet of the home, which was of a fairly high standard.

"The experimental groups were also kept on the regulation diet of the home, the supplemental feeding of the best sources of vitamin C as follows:

Group I—Juice of 3 oranges and 3 ripe bananas daily

Group II—8 oz. orange juice daily

Group III—3 bananas daily

Group IV—6 oz. tomato juice daily

"The dental examinations in all homes were as thorough as possible. Any abnormal condition of the gums no matter how slight, was recorded as to its degree of severity.

"In Home L, where the vitamin C experiments were conducted, it is doubtful that the differences were significant, either as to dental caries incidence or changes in gum conditions.

"In order to more accurately evaluate the results obtained during the year 1930-31, we decided to repeat

1. McBEATH, EWING C. Nutritional control of dental caries. *N. Y. State Jour. of Med.* 33:1086-1088. 1933.

our dietary experiments in the same homes during 1931-32, using the same groups for our observations, and reversing them; that is, making the controls of the previous year the experimentals, and the experimentals of the previous year controls.

"The diets used, the sizes and personnel of the experimental and control groups, and the time involved were approximately the same as during the previous year."

The results from these two years of observations are summarized as follows:

"The studies at Home L were devised to evaluate the effect of added vitamin C in three forms, orange juice, tomato juice, and bananas.

"From the data one can not draw support for the view that vitamin C was of prime importance in the differences observed."

The results of these and similar studies elsewhere makes it fairly evident that vitamin C is not an important factor in connection with dental caries.

NUTRITION

There has been a considerable list of reports by various workers which has shown that as the diet was made less satisfactory in a number of different ways the proportion of tooth difficulties increased among the experimental animals.

It has long been known that calcium and phosphorus were important and in fact necessary to the building of bones and teeth. Accordingly, it was not surprising that diets deficient in either of these minerals proved productive of increased damage to teeth.

As early as 1918² it was announced that "the problem of dental caries and periodontal diseases is fundamentally a problem of nutrition" and at the same time it was suggested that vitamin D was an important factor.

Until somewhat recently, it has been difficult to provide experimental rations containing vitamin D and not also containing vitamin A. Accordingly there has been the thought that vitamin A might also be important in protecting teeth.

Recently, there has appeared the results of a study³ which seems to have cleared up

2. MELLANBY, MAY. *Lancet* 2:767 (Dec. 7). 1918.

3. AGNEW, M. C., R. G. AGNEW and F. F. TISDALL. The production and prevention of dental caries. *J. Amer. Dent. Asso.* 20:193-212. 1933.

the situation in an unusually successful manner.

Earlier students of this caries problem have been only moderately successful in devising experiments in which the various factors were brought out clearly. However, in this work practically all of the factors tested came out clearly and the workers were able to produce 100 per cent positive results or to protect 100 per cent of the the animals as the case might be. Accordingly, their findings inspire a feeling of confidence which has been somewhat lacking regarding the interpretations which have been made of many of the earlier studies.

Their feeding experiments were carried out with albino and hooded rats. They fed 365 rats on what they believed to be normal rations and no caries of teeth could be found. Seventy-one of these were killed and examined microscopically without finding any traces of caries.

In sharp contrast to these they report on the feeding of 140 rats, in groups, with known variations of calcium, phosphorus and the various vitamins. In these experimental feedings it was found possible to largely control the development of dental caries, the feeding of phosphorus and of vitamin D being the important items.

There was also reported studies which are under way with some 350 children, the report regarding the results to date being as follows:

WORK WITH CHILDREN

"It is realized fully that the value of this work lies in its application to man. Accordingly, a total of approximately 350 children on diets containing varying amounts of calcium, phosphorus and vitamin D have been observed during the past year in four institutions with the aid of a group of dentists of Toronto. A most meticulous dental examination was carried out at the beginning of the investigation and will be repeated at its conclusion. During the period of the investigation, the children have been divided into three groups as follows:

- "(1) the control group, in which no change has been made in the diet;
- (2) a group who have been given additional vitamin D, and
- (3) a group who have been given both additional vitamin D and phosphorus.

"An interim examination has recently been made of the children in groups 1 and 2. To insure an unbiased

interpretation of results, operators in examining the children were unaware of the groups in which the children were classified until all the records were completed.

"This examination showed, in those children who had been given additional vitamin D, a definite trend toward a lessened incidence of caries as compared to those who had eaten only the usual normal diet. Moreover, the children with added vitamin D showed that previously existing cavities had been largely arrested. In certain of these arrested cases, a definite hardening of the cavity walls was apparent.

"The general tone of the gingivae and of the mucous membrane of the mouth of these children showed a definite improvement when compared with the gingivae and mucous membrane of those children who had not been given the additional supply of vitamin D."

These interesting studies of the causes of decay in teeth are summarized by the authors as follows:

SUMMARY

"1. No evidence of dental caries was found in 365 animals fed the normal diets for periods of from two to eighteen months.

"2. Seventy out of seventy-one animals fed a diet low in phosphorous and vitamin D for periods of from two to seven months showed dental caries. This diet, composed largely of corn and wheat gluten, is also low in other minerals and vitamins, and the proteins are not of a good quality.

"3. The addition of vitamins A, B₁, B₂, C and E to this diet apparently did not have any effect on the development of dental caries.

"4. The addition of phosphorus to this diet prevented the development of dental caries in four out of seven rats when fed for periods of from two and three-quarters to six months.

"5. The addition of vitamin D to this diet in the form of viosterol prevented the development of dental caries in six out of nineteen rats when fed for periods of two and one-half to five months.

"6. Ten animals were fed a diet composed of corn-starch, casein, vegetable fat (crisco) and yeast, with added minerals and vitamins for periods of from five and one-half to thirteen months. This diet, although low in phosphorous and vitamin D, is adequate in other respects. Dental caries developed in five of these animals.

"7. Nine animals fed this diet with the addition of vitamin D in the form of viosterol for periods of from six to thirteen months did not show evidences of dental caries in any instance.

"8. The amount of calcium in the diet apparently had no influence on the development of dental caries.

"9. A preliminary examination of a number of children under observation indicates the importance of an adequate supply of vitamin D for the prevention of dental caries."

The authors likewise drew the following conclusions from their work:

CONCLUSIONS

"1. Dental caries can be produced and prevented in laboratory animals at will by dietary means.

"2. In the rat, an adequate supply of phosphorous is an important factor in the prevention of dental caries.

"3. In the rat, an adequate supply of vitamin D may prevent or delay the onset of dental caries. In this animal, the role of vitamin D is not of such great importance as that of phosphorous.

"4. In man, the addition of vitamin D to diets previously considered adequate in all respects, including phosphorous intake, is an important factor in the prevention of dental caries."

This study seems to us extremely important in that it makes plain that of the various vitamins now recognized in our foods, vitamin D is the one of outstanding importance in preserving the teeth. That vitamin coupled with satisfactory supplies of calcium and phosphorus forms the essential requirements which must be furnished in connection with ordinary diet in order to retain our teeth in good working order.

No less an authority on nutrition than Dr. E. V. McCollum has commented on this work as follows:

COMMENTS BY DR. MCCOLLUM

"The significant fact," said Dr. McCollum, "is that the Agnews for the first time, consciously and under scientific control, have succeeded in producing and preventing dental caries (decay) practically at will, and to a degree approaching 100 per cent. Their work gives further strength to the conclusion that dental caries can be largely, perhaps wholly, prevented by correct eating.

"The Agnew work enables us to dispose of certain misconceptions more or less widely held in the past. The popular belief that tooth decay is due to impaction and fermentation of food within fissures of the teeth is doubtless true in certain cases. We will probably never be able to do without the toothbrush.

"One of the oldest, most widely held and most erroneous popular beliefs has been that tooth-decay is largely due to eating too much sugar and other sweets. Although sugar itself does not decay teeth, sweet-eating contributes indirectly, because sugar satiates the appetite so quickly that a lack of the more essential food elements usually results. The Agnews appear to have conclusively demonstrated this truth in the experimental research they have just reported. Another theory that gained wide acceptance is that decay is caused by a deficiency of vitamin C. It has nothing to do with the primary cause of dental caries.

4. *Ohio Health News*. 9:Dec. 1, 1933.

"The inference to be drawn from this research work is that if we eat an adequate supply of vitamin D, drink plenty of milk, and eat plenty of vegetables and other foods rich in phosphorous, nearly all of us can avoid dental caries."

VITAMIN D MILK

It seems to us that this demonstration of the relation of dental difficulties to calcium, phosphorus and vitamin D is one of the most important results of technical research of recent years.

Dental caries is evidently affecting practically all of our population and is interfering seriously with the health and happiness of all.

The remedy for this serious situation is shown to be the free use of these three substances. Evidently when they are present in the diet in reasonable amounts there is every reason to expect that our dental difficulties will be largely over.

It has long been recognized that milk is the item in our diet through which calcium and phosphorus are now mainly supplied. The suggestion by Dr. H. C. Sherman that we should use the equivalent of a quart of milk a day arose largely from the fact that by such use we would guarantee a proper supply of these minerals, largely deficient in the other items of our ordinary diet.

It has likewise been recognized for some time that the utilization of this calcium and phosphorus in the building of bone required the presence of vitamin D in reasonable quantities. It is now evident that their use in the maintenance of teeth likewise requires the aid of this same vitamin D.

Vitamin D is present in raw or pasteurized milk at the rate of 6 to 10 rat units per quart. Irradiated milk contains this material in about seven times the strength of the unirradiated article. Accordingly, irradiated milk or milk to which vitamin D has been added combines the three substances required for the protection of the teeth and combines them in an especially attractive form.

Evidently, every adult who is desirous of preserving his or her present equipment of teeth should use vitamin D milk every day.

H.A. Harding



● THE STORY OF
IRRADIATED VITAMIN 'D' MILK

We again **KEEP OUR PLEDGE**

By the very nature of our function as your milk dealer we are the keeper of a sacred trust.

We realize that the health and well-being of all your family lies in our hands—that ours is the responsibility of safeguarding and nourishing them by furnishing products of utmost purity, wholesomeness and nutritive value.

We have pledged ourselves constantly to improve the beneficial qualities of our milk—not merely by exercising more rigid control and selection of farm sources, but by applying new plant methods for safeguarding the purity and wholesomeness of milk.

In adopting direct irradiation of milk for Vitamin D enrichment, we have again kept this pledge by making available to you the most important nutritional discovery in the dairy field since the introduction of pasteurization.

● Irradiated Vitamin D Milk is milk of standard grade in which the Vitamin D content has been increased by exposure to ultra-violet light.

The story behind this revolutionary development concerns the nutritional improvement of nearly every civilized being. You and your family are no exception, though they may appear to be. The vital need for more Vitamin D is one of the most important and dramatic discoveries of this age.

You will find the story intensely interesting.

EVERY housewife, especially every mother, should know the vitamins and realize that unless they are present in the diet constantly, in adequate amounts, her family's health will suffer.

Fortunately you do not have to worry so much about Vitamins A, B, C, E and G. They can be supplied plentifully by a proper selection of the diet. But not so with Vitamin D! No foods contain enough Vitamin D for our needs, even were we to eat many times as much as our systems could tolerate. Egg yolk is the richest. A few kinds of fish contain some. Butter and ordinary milk have a small amount, but winter-produced dairy products are low in it.

Practically none of the cereals naturally contains more than a trace of Vitamin D. Fruits, vegetables and all other foods are practically devoid of it.

WHAT IS VITAMIN D? ● You will realize the seriousness of this lack when you understand the extremely important function of Vitamin D. It must be present in sufficient quantity before the body can make proper use of calcium and phosphorus, the minerals needed in the development of the bones and teeth.

Vitamin D can be compared to the cement in a brick wall. Without the cement the bricks are not bound into a firm structure. Similarly, without sufficient Vitamin D, the essential minerals in our foods, calcium and phosphorus, are inefficiently used and do not form firm bone and tooth structure.

Vitamin D is developed naturally in the body by sunshine. Sunshine, as you know, is made up of many different kinds of rays. Some we feel as radiant heat. Some are light waves of all colors. The ray that creates Vitamin D is a light energy wave just beyond the limit of our eyesight—invisible ultra-violet. But, unfortunately, most sunshine, and especially most of the ultra-violet, is kept from us. We live too far north, for one reason. During seven or eight months of fall and winter, the sun remains too low in the southern sky, and ultra-violet waves, like the sun's heat waves, are then less intense. Even in summer these rays are shut out by clouds and by the smoke, soot, dust and shade of city life. Clothing, building walls and even window glass completely absorb this source of Vitamin D.

Like these toy blocks, bone-building calcium and phosphorus are merely loose building materials, until cemented into a strong, unified structure. In our bodies, Vitamin D functions like this cement.





We cannot enjoy summer sunshine like this daily the year around . . .

LACK OF VITAMIN D CAUSE OF RICKETS ● This universal lack of Vitamin D has many serious consequences. It is the direct cause of the scourge of rickets, the common nutritional disease of the first year of life. Rickets is faulty development and imperfect hardening of the bone structure.

In mild rickets there may be no outward evidence of deficiency. Your child may have it without your knowing it. Many a mother has learned of this condition only when the alert doctor has used the X-ray, or other means of detection to prove his suspicions. In acute form it may result in bow-legs, knock knees, "pot belly," bulging forehead, "chicken breast," softening of cranial bones, enlarged joints and other deformities, as well as weak, crooked teeth, muscular weakness and nervous instability. Every mother should know these signs.

Rickets is not rare, and mild rickets is widely prevalent. During the winter of 1930-31 fully *one-half* of the white infants and approximately *three-fourths* of the negro infants who came to the health clinics in New York City showed definite signs of rickets, according to the report of Dr. A. F. Hess and associates, in the Journal of the American Medical Association, August 8, 1931. Other reports show that this percentage is little less alarming in smaller towns and cities and that rickets is found in the families of rich and poor.



But we now can get our Vitamin D in an equally pleasant way—by drinking Irradiated Milk.

ONE REASON FOR BAD TEETH ● Authorities now realize that our insufficiency of Vitamin D is one contributing cause of early tooth decay, which concerns adults as well as the young. Our bones and teeth are living parts of us, subject to active wear and tear and needing steady repair and nourishment. No less an authority than Dr. E. V. McCollum, of Johns Hopkins University, cites the new belief that "the lack of certain mineral elements—particularly calcium and phosphorus—is closely connected with tooth decay."

Now comes clinical proof. Tests on infants at the Children's Hospital of Toronto show definitely that a proper amount of the vitamin in early months, with an otherwise adequate diet, means, in almost every case, the difference between weak, poorly formed teeth and sound, straight teeth.

SERIOUS NEED DURING MOTHERHOOD ● Vitamin D is particularly needed by mothers during the pre-natal and nursing period. In meeting the double demand for minerals, she gives to her child, drawing upon her own bones and teeth if there is not enough Vitamin D in her diet. The old saying, "A tooth for every child," owes its origin to the commonness of this occurrence.

A serious aftermath of early Vitamin D deficiency is a contracted or narrow pelvis in the baby girl, which if not corrected during the growing years means peril later when she becomes a mother.



Think what this significant statement means to this baby—and to yours. "Irradiated Milk seems to be the most desirable means of preventing rickets on a community scale. Only 20 to 24 ounces (2½ to 3 glasses) daily is needed to assure protection."
—Dr. A. F. Hess.

THE SEVERAL SOURCES OF VITAMIN D

● During the summer months we should, of course, be out in the open as much as possible. Especially should this exposure be made where the air is free from smoke and dust. This will temporarily lessen our deficiency.

There are several good medicinal sources of Vitamin D, such as cod liver oil, halibut liver oil, and viosterol. The "sun lamp" generates ultra-violet light artificially. While these sources have been excellent, none to date has been so universally adopted that elimination of rickets has resulted.

NOW COMES IRRADIATED MILK

● Now science has given us a suitable, automatic way to secure Vitamin D—through irradiation of the milk. Irradiated Milk is just the standard grade of milk which has been enriched with Vitamin D by brief exposure to ultra-violet light in the bottling plant.

Of all foods, milk is the most ideal carrier of this vitamin because it contains a rich supply of calcium and phosphorus, the minerals with which Vitamin D does its "cementing" work. This fact, together with the ease with which the milk dealer can irradiate his entire volume, has led many medical authorities to regard milk irradiation as one of the great nutritional discoveries of recent years.

IRRADIATED MILK PREVENTS RICKETS ● Tests by numerous nationally known clinicians and scientists prove that Irradiated Vitamin D Milk definitely prevents rickets. A baby or child drinking a quart or even less of properly Irradiated Milk every day is automatically protected.

Irradiated Milk now has the backing of several years of clinical observations, both in hospitals and in private practice. Even before clinical tests on babies were made, the benefits of irradiation to human beings were definitely predictable through thousands of tests on animals.

Every parent should know, for example, of the thrilling results obtained by Dr. A. F. Hess, Dr. J. M. Mitchell and other famous medical authorities in a laboratory experiment with over 100 infants from baby health clinics of the New York City Health Department. These children were fed Vitamin D Irradiated Milk. All but one, which was prematurely born, remained free from rickets. (Rickets cannot be entirely prevented in premature babies.)

WHO SHOULD USE IRRADIATED MILK? ● Infants and children need a generous, steady supply of Irradiated Vitamin D Milk in the diet, from birth on through the entire growing period. This safeguard is the surest means of giving your children their birthright of sturdy bones, straight limbs, sound straight teeth, and a full chest development needed for full lung expansion.

Supplying it in girlhood when the bony frame is developing is a necessary step in preparing your daughter for normal, easy motherhood.

Older children need it to prevent late rickets, which is by no means unusual.

Mothers have double need for Irradiated Milk. Its addition to the prenatal and nursing diet helps protect the mother and insure proper development of the child.

Very recently it has come to be known that additional Vitamin D is nutritional—essential to sound teeth and bones and proper use of calcium and phosphorus of foods throughout life. Irradiated Milk, hence, is for all people—for the whole family.

FURTHER FACTS YOU SHOULD KNOW ● Irradiation has no effect whatever on the flavor, taste, or appearance of milk and it increases the food value. Cooking does not destroy Vitamin D.

The Irradiation process is controlled by the Wisconsin Alumni Research Foundation, a scientific organization through which Dr. Steenbock, the discoverer, has chosen to give his findings to the world. All milk dealers using the Steenbock process must first be licensed by the Foundation,

and the product of all licensed dealers is continually subjected to frequent laboratory tests to check the uniformity and potency of the Vitamin D content.

The Foundation will be glad to supply any desired information to members of the medical and dental professions, public health officials, school executives, social workers, milk dealers and others identified with the dairy industry, as well as to people interested in this milk for themselves and their families.



The advertising claims for our Irradiated Vitamin D Milk have been passed upon and accepted by the American Medical Association, Committee on Foods.



The process of direct irradiation of milk by ultra-violet light is controlled by the Wisconsin Alumni Research Foundation, under the Steenbock patent (U. S. Patent No. 1680816).

This is a sample copy of a booklet intended for distribution by dairies licensed to irradiate milk. It was prepared by the Wisconsin Alumni Research Foundation and is available to any licensee at actual cost of production. ☆ ☆ ☆ ☆ ☆

for further information address

THE CREAMERY PACKAGE MFG. COMPANY

Manufacturers of the CP Milk Irradiator and associated equipment for producing Vitamin D Milk

General Offices: 1243 W. Washington Boulevard, Chicago, Illinois

Reprinted from

DAIRY PRODUCE

Milk Plant Edition



Issue of July 8, 1933

Reprinted from

DAIRY PRODUCE

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Issue of July 8, 1933

All Milk at Producers' Creamery, Benton Harbor, Mich. Now Irradiated Vitamin D

FOR the past year, the incorporation of supplementary quantities of Vitamin D in milk has had a growing consideration among dairy trade executives. In fact, some regard it as the most outstanding development in milk since pasteurization. Just how general its adoption by the industry will become cannot be predicted with accuracy, but that it is being widely considered is obvious.

Much of the interest in increased Vitamin D contents for food products has developed from the findings and experiments of Dr. Steenbock of the University of Wisconsin. His feeding of yeast to dairy cows and development of the ultra-violet ray as a means of direct irradiation, thus increasing the Vitamin D potency of natural foods, has received wide attention. The use of oils rich in Vitamin D as an added element for milk has also developed.

While brought out many months after dairy firms in some parts of the country had done considerable work on Vitamin D for milk under the oil or yeast methods, the direct irradiation idea is gaining recognition rapidly in this field. A number of prominent firms are working with it at present.

While many firms have added Vitamin D milk to their line as a specialty, the first in the country to adopt the Vitamin D process for all the milk it sells is the Producers' Creamery of Benton Harbor, Michigan. The Producers' Creamery is operated by the Berrien County Milk Producers' Association, a producers' co-operative. It has gone the whole route and is now irradiating all Grade A and Grade B milk. Not only that, it is offering this Vitamin D product at no advance in price over what it had been getting before.

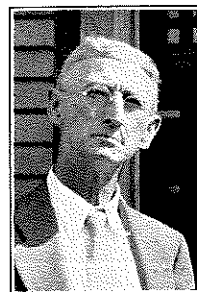
The change was made early in June and when questioned several weeks later both Fred Gleason, president of the association, and Chris Andersen, manager of the creamery, expressed



Plant of Producers' Creamery, Benton Harbor, Michigan, where Vitamin D milk is processed.

themselves as well pleased with the early results.

"We were really surprised at the reception of our customers and the local medical group to the idea of Vitamin D milk," declared Mr. Andersen. "With just a few exceptions, there was no protest over the change. One old-fashioned doctor objected and a few



F. GLEASON



C. ANDERSEN

other customers were not satisfied, but on the whole our business has shown a material increase which we attribute at least in part to the new Vitamin D feature and the advertising which accompanied its introduction. "We studied this matter for some time and came to the conclusion that there is something to the Vitamin D development for milk. This despite the fact that it did not appeal to us, at first. There has been nothing of outstanding importance in connection with milk processing since pasteurization. The knowledge of vitamins has been spreading and this may exert as great an influence upon dairy methods as pasteurization.

"The direct irradiation method appealed to us because there is nothing added to the product. Our local health department and the local physicians have endorsed the Vitamin D milk and

our methods. In fact, we consulted them and secured their acceptance before deciding upon the move. Through the early weeks of the campaign, the doctors have been especially helpful.

"The ultra-violet ray has had absolutely no effect on the flavor of our milk. Some people declare they can detect a difference, but this is largely a matter of imagination. Given comparative samples, they are unable to definitely distinguish Vitamin D milk from regular milk."

The Producers' Creamery is offering the Vitamin D milk at no additional cost to its customers. Both Mr. Gleason and Mr. Andersen believe the adoption of the process a progressive move, not only from the standpoint of their organization but with respect to milk itself. They feel that it strengthens the sales story. In addition they believe the public is entitled to the benefits of this process at a reasonable cost. Accordingly, they have absorbed all the additional expense involved. The co-operative manager estimates the cost at approximately one-half cent per quart. As previously mentioned, both grades of milk sold by the Producers' Creamery are irradiated. Grade A, a 5 per cent butterfat product, retails for 11 cents, and Grade B, a 4 per cent milk, at 10 cents, with a discount if tickets are purchased.

According to President Gleason, sales increased approximately 1,000 units during the first three weeks of the Vitamin D campaign. Three newspaper announcements had been published and route men were telling the story first hand, but no other introductory methods were used. While much of the increased business is attributed to the attraction of new customers as a result of the Vitamin D program, they were counting upon the new process to bring greater milk sales through increased consumption on the part of regular customers rather than by acquiring a large number of new ones. The fact that the Benton Harbor co-operative has applied the Vitamin D process to all milk at a cost of one-half cent per quart indicates that it is depending upon increased sales to offset the additional cost. As a licensee under the Steenbock patents, the dairy pays a flat royalty plus a fraction of a cent per quart.

The apparatus was installed at the Producers' Creamery plant to accomplish the Vitamin D process by engineers of the Creamery Package Manufacturing Co. It consists of two irradiators, an electric control box and two milk pumps. The control boxes regulate the flow and register the amount of electricity used in the irra-



We have kept our Pledge TO THE PEOPLE OF THIS COMMUNITY

YEARS ago we promised the people of Benton Harbor and St. Joseph that Producers' Creamery would always provide them with the purest and finest milk that the most up-to-date methods could produce. Guided always by the opinion of the medical fraternity, we have long been among the first in America to adopt new methods as dairy science progresses.

In making Irradiated Vitamin D Milk available to you, at no advance in price, we have again kept our pledge.

This milk is Producers, both Regular and Special, pure, rich, pasteurized milk which has been enriched with Vitamin D by a process known as irradiation, or exposure of milk to ultra-violet rays.

This milk contains sufficient Vitamin D to prevent rickets in children. Rickets is delayed hardening of the bones, and in extreme cases is the cause of bowlegs, poor chest development, and defective teeth. Medical science has proved that rickets is caused by a lack of Vitamin D, which is the vitamin that enables our bodies to properly assimilate the necessary bone-forming minerals, calcium, and phosphorus, contained in milk.

The Vitamin D content of Producers' Irradiated Milk is also sufficient to offset the deficiency in our adult diet. It is vitally important in the prenatal and nursing diet and in the feeding of the child from birth through the entire period of growth. Adults need this milk throughout their lives, to help keep their teeth sound and body resistance up to normal, in the opinion of many leading medical authorities.

No foreign substance has been added to Irradiated Milk. The taste is unchanged. The Vitamin D potency is not reduced by cooking. It is just your most nearly perfect food, with a new and vital reason for making milk the foundation of a healthful, happy life.

Sincerely yours,
PRODUCERS' CREAMERY

This beautiful built-up sanitary process which results in Producers' high standard of purity and quality.



The new irradiator, whose ultra-violet rays give Irradiated Milk its Vitamin D.

Bottles are filled automatically—untouched by human hand.

PRODUCERS IRRADIATED Vitamin D MILK "Ask Your Doctor"

Approved by a large majority of the physicians of Benton Harbor and St. Joseph. This seal denotes that the advertising for this milk is accepted by the American Medical Association, Committee on Foods.



Irradiated with ultra-violet rays under license by the Wisconsin Alumni Research Foundation, under the Steenbock patent (U. S. Patent No. 1680818).

Second Advertisement of Series on Vitamin D Milk

diator. It offers a check on the process similar to that afforded by temperature recording instruments in connection with pasteurization. Health officials and plant managers can check the irradiation process by this means. A slight rearrangement of the equipment near the pasteurizers and holders in the Benton Harbor plant was made necessary by the compact hook-up there.

The irradiators are large cylindrical shaped units, made of stainless steel, slightly wider at the top than at the bottom. The ultra-violet ray is given

off by a carbon-arc lamp suspended from the top down into the unit. When in operation, the light is in the exact center. Irradiation is the first process, milk being exposed to the violet rays before pasteurization begins. Raw milk is pumped to the unit and enters the irradiator at the top, flowing around a distributing trough and falling through a series of small holes down the inside wall of the cylinder in a thin film. During its descent, the milk is exposed to the violet rays. Passing through the unit at the bottom, the milk, now irradiated,

IN THE VAN OF PROGRESS



PRODUCERS CREAMERY ANNOUNCES THAT IRRADIATED Vitamin D MILK

WILL BE AVAILABLE IN THE
TWIN CITIES beginning TOMORROW

TOMORROW morning and thereafter the milk supplied by Producers Creamery will be Irradiated Vitamin D Milk. In taking this step we are following out a pledge of long standing: that we will give our customers the benefits of every advancement made in dairy science, as quickly as we are assured of its value.

Following the perfection of a practical scientific method of increasing the Vitamin D content of milk, we consulted the physicians of this community and received their unqualified approval.

Then followed our decision to adopt the method, and to make sure that its benefits may be enjoyed by all citizens, rich and poor, we have arranged to absorb the extra cost entailed and are making it available in both grades of milk at no advance in price.

Importance—and Lack—of Vitamin D

You doubtless are not entirely familiar with Irradiated Milk and it is no more than right that we tell you briefly about it.

As you know, Vitamin D is the "sunshine" vitamin which in minute quantities stimulates the cells and helps the human body utilize lime and phosphorus, minerals, which are essential elements in the formation and maintenance of bones and teeth.

Vitamin D has been known and understood for many years, but we now realize more fully what an important part it plays in protecting babies against rickets or delayed hardening of the bones. In extreme cases it is the cause of bowlegs, underdeveloped teeth, defective teeth and similar conditions.

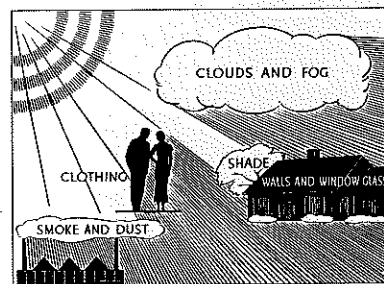
Many leading authorities also believe that sufficient Vitamin D is an essential to sound teeth and increased vigor and resistance in adult life.

Perhaps the most serious fact is our widespread deficiency of Vitamin D and the extent of rickets and other consequences. For every extreme case of visible rickets, there are many milder cases where the evidence is to be seen under the X-ray. Medical authorities have estimated that from 90 to 95 per cent of all children have rickets in some degree.

You wonder why Nature failed us so—for the did not put even a small fraction of enough Vitamin D in our diet. Few foods have even a little. Most foods have none.

Nature did not fail us, really—the simply didn't foresee our sheltered mode of life. She meant for us to receive this vitamin

Important step is taken after majority of physicians in this community endorse the beneficial effects of Irradiated Milk



How Nature's supply of Vitamin D, ultra-violet rays of sunlight, is cut off by weather and civilized life

The thickest clouds filter out much of the invisible ultra-violet rays that constitute our main natural source of this vitamin. Shade, fog and dust obscure, smother liberates. Ordinary window glass lets through absolutely none! And, finally, our clothing is a perfect blanket.

through our skin from the ultra-violet rays of sunlight—and we are robbed of nine-tenths of these rays by clouds, fog, smoke, dust, shade, indoor life, window glass and clothing. (See diagram)

The Discovery of Irradiation
In 1911 Dr. Steenbock of the University of Wisconsin began experimenting with artificially produced ultra-violet rays. After long research, he and others proved that our universal food, milk, already so rich in the minerals we need, can be "irradiated," or enriched with Vitamin D by exposure to these rays, without affecting its flavor or food value in the slightest degree. Absolutely no foreign substance is added—the taste is not affected. The vitamin content is not diminished by cooking.

The method of irradiating is simple: milk is exposed in a thin film to the ultra-violet rays of an improved carbon-arc sun-lamp. Through the Wisconsin Alumni Research Foundation, Dr. Steenbock has chosen to give this discovery to all people. As a licensee of the Foundation, Producers Creamery is assured competent laboratory supervision on the Vitamin D potency of the milk.

Who Needs Vitamin D Milk?

Producers Irradiated Milk is for all the people. It supplies children with the necessary calcium, phosphorus and Vitamin D to prevent rickets.

It is vitally important in the pre-natal and nursing diet and in the feeding of the child from birth through the entire period of growth. Adults need this milk throughout their lives, to help keep their teeth sound and build resistance up to normal, in the opinion of many leading medical authorities.

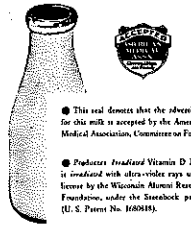
The milk is offered as a preventive measure only, not curative. Children who already have rickets, and others with special needs, should use it only as it fits into the physician's diet program. If you have the slightest doubt about the use of Producers Irradiated Milk by yourself or anyone else in your family, ask your doctor and be governed by his recommendation.

Your Finest Milk Made Better

Producers Creamery owes its large patronage to a policy of furnishing the best milk modern methods can produce. Irradiated Milk is simply the best pasteurized milk made even more beneficial. You now have one more reason—and a vital one, indeed—for making milk the foundation of your family diet.

If you are not now a patron of Producers Creamery, you will want to avail yourself of this milk, beginning tomorrow. There is no advance in price.

PRODUCERS CREAMERY
Benton Harbor, Mich. Telephone 6154



● This seal denotes that the advertising for this milk is accepted by the American Medical Association, Committee on Foods.

● Producers Irradiated Vitamin D Milk is irradiated with ultra-violet rays under license by the Wisconsin Alumni Research Foundation, under the Steenbock patent (U. S. Patent No. 1,804,119).

Newspaper Advertisement Announcing Vitamin D Policy

is handled through the plant in the usual routine. The exposure of milk is timed in relation to the speed of its descent so as to give just the correct amount of irradiation. Under this method, all milk is exposed to the lamp

equally and the irradiation is uniform. While the irradiator lamp is held in a fixed position, the outer section or cylinder may be lowered to the floor for cleaning when the apparatus is not in operation.

Consumer Advertising

Irradiated VITAMIN "D" MILK

●

This folder contains reproductions of advertisements prepared by the Wisconsin Alumni Research Foundation which are available to licensed dairies without cost.

●

THE CREAMERY PACKAGE MFG. COMPANY
Manufacturers and Distributors of the C P Milk Irradiator and
Associated Equipment for Producing Irradiated Vitamin D Milk
General Offices: 1243 W. Washington Blvd., Chicago, Ill.

IN THE VAN OF PROGRESS



*DOEVILLE DAIRY

ANNOUNCES THAT

IRRADIATED Vitamin D MILK

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Then followed our decision to adopt the method; and to make sure that its benefits may be enjoyed by all citizens, rich and poor, we have arranged to produce it in unlimited quantities.

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The diet of man is generally found to be deficient in Vitamin D more often than in the case of any other food factor.

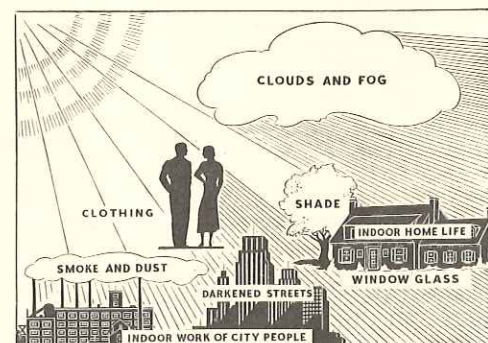
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Everyone needs this vitamin—for it is one of the important food essentials for good nutrition of the teeth.

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Who Needs Vitamin D Milk?

Our Irradiated Milk is for all the people. It supplies children with the necessary calcium, phosphorus and Vitamin D to prevent rickets. Whenever it is necessary to supplement breast feeding with cow's milk, especially choose Irradiated Milk, which contains an abundant supply of Vitamin D. The usual milk is almost entirely lacking in this food factor. The nursing mother should drink it herself, as a protection for her own bones and teeth, which will give up part of their calcium and phosphorus content to replenish any insufficiency in her milk.

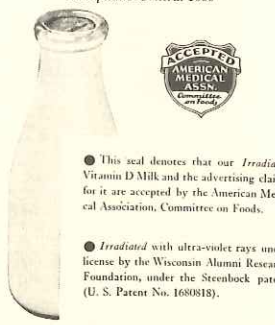
The milk is offered as a *preventive* measure only, *not* curative. Children who already have rickets, and others with special needs, should use it only as it fits into the physician's diet program. If you have the slightest doubt about the use of our Irradiated Milk by yourself or anyone else in your family, ask your doctor and be governed by his recommendation.

Your Finest Milk Made Better

This company owes its large patronage to a policy of furnishing the best milk modern methods can produce. Irradiated Milk is simply the best pasteurized milk made even more beneficial. You now have one more reason—and a vital one, indeed—for making milk the foundation of your family diet.

If you are not now a patron of this dairy, you will want to avail yourself of this milk, beginning tomorrow.

*DOEVILLE DAIRY
Telephone Central 1000



This seal denotes that our Irradiated Vitamin D Milk and the advertising claims for it are accepted by the American Medical Association, Committee on Foods.

Irradiated with ultra-violet rays under license by the Wisconsin Alumni Research Foundation, under the Steenbock patent (U.S. Patent No. 1680818).



Ad. No. 1—Full Page

Advertisement No. 1
Size—full page (16 1/2"x21")



100 Babies PROVE THAT IRRADIATED VITAMIN "D" MILK WILL PROTECT YOUR CHILDREN FROM RICKETS

● The babies in this now-famous experiment were just ordinary lovable babies, like yours.

They were selected from the thousands brought to two baby clinics of the New York City Department of Health. Their ages were from two weeks to six weeks.

These babies were fed Vitamin D Irradiated Milk. The result was that all but one, which was premature, remained entirely free from rickets or bone disease.

In reviewing research on Irradiation of milk the distinguished medical scientist, Dr. A.F. Hess, of Columbia University, New York, recently concluded: "Irradiated Milk seems to be the most desirable anti-rachitic for prevention on a com-

munity scale. Only 20 to 24 ounces daily is needed to assure protection—this therapeutic agent has the advantage of being automatic and inexpensive and of providing calcium and phosphorus as well as the anti-rachitic factor."

Realize the significance of this and similar clinical tests, and the widespread prevalence of rickets—and you will understand why Irradiated Vitamin D Milk is hailed as one of the truly great food discoveries.

We have made arrangements to furnish properly Irradiated Milk to all of our customers. We suggest that you take it for your family.

An interesting educational booklet will be sent free upon request.

Rickets in some form strikes fully one-half of all the babies in America

Rickets or bone disease is caused by a diet deficient in Vitamin D. It is not a rare disease, but is widely prevalent. Over 50 per cent of American infants suffer rickets in some degree. In acute cases this disease causes bow legs, knock knees, deformed chest and pelvis, bulging forehead, crooked and weak teeth, and other handicapping deformities.

Many babies who escape rickets do so by only the slenderest margin, their bodily reserve of Vitamin D and minerals being depleted to the danger point.

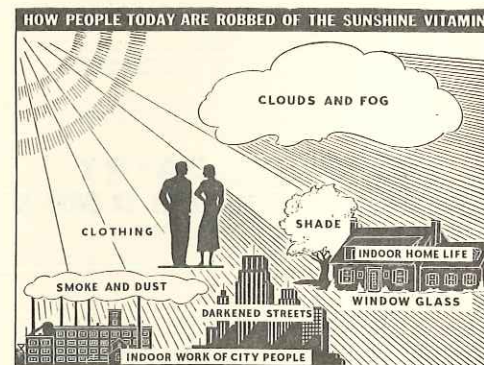
DOEVILLE DAIRY

NAME, ADDRESS AND TELEPHONE NUMBER

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Irradiated with ultra-violet rays under license by the Wisconsin Alumni Research Foundation, under the Steenbock patent (U.S. Patent No. 1680818).

Advertisement No. 6
600 lines—5 cols.



A GREAT MODERN HEALTH PROBLEM IS EXPLAINED BY THIS CHART

● This picture shows why so many babies have rickets or faulty bone development—why Irradiated Vitamin D Milk should be a regular part of the diet of everyone in your family the year around.

It shows how modern living conditions rob us of Vitamin D, the vitamin that helps build strong bones and teeth—the only one of the vitamins not obtainable by a selection of natural foods.

Vitamin D is developed naturally in the body by sunshine. Sunshine, as you know, is made up of many different kinds of rays. Some we feel as radiant heat. Some are light waves of all colors. The ray that creates Vitamin D is a light wave just beyond the limit of our eyesight—invisible ultra-violet.

But unfortunately most sunshine, and especially most of the ultra-violet, is kept from us. We live too far north, for one reason. During seven or eight months of fall and winter the sun remains too low in the southern sky, and ultra-violet waves, like the sun's heat waves, are then less intense.

Even in summer these rays are shut out by clouds and by the smoke, soot, dust, and shade of city life. Clothing, building walls and even window glass completely absorb this source of Vitamin D.

Great Food Discovery Brings Vitamin D Back to Us

This serious condition couldn't go on. Now it needn't. By a simple process known as Irradiation, milk is exposed to ultra-violet light and made rich in Vitamin D. Irradiated Milk restores this vitamin to the diet in an amount adequate for all ages.

While everyone needs more Vitamin D, your baby will benefit especially from Irradiated Vitamin D Milk. He should be given this milk, as soon as it is necessary to supplement breast-feeding, in place of normal milk.

The nursing mother likewise should drink this protective milk, in order to protect her bones and teeth from the tendency to soften during the nursing period.

Irradiation makes milk, already one of the most perfect foods, an even greater food value—a food which should be last to be reduced when slim budgets narrow the family food selection. Ask us today to start supplying your family with Irradiated Milk. FREE booklet tells dramatic story. Ask driver or phone for your copy.

DOEVILLE DAIRY

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Advertisement No. 7
450 lines—3 cols.

WE HAVE KEPT OUR Pledge to the people of this community

By the very nature of our function as your milk dealer we are the keeper of a sacred trust. We realize that ours is the responsibility of safeguarding and nourishing your family by furnishing products of utmost purity, wholesomeness and nutritive value.

We have pledged ourselves constantly to improve the beneficial qualities of our products—not merely by exercising more rigid control and selection of farm sources, but by applying new plant methods for safeguarding the purity and wholesomeness of milk.

In adopting the Irradiation process of producing Vitamin D in milk, we have again kept this pledge by making available to you the most important discovery in the dairy field since pasteurization.

Irradiated Milk is our pure, pasteurized milk which has been enriched with Vitamin D by exposure to ultra-violet rays (same as those of sunshine). Vitamin D is the food factor that enables our bodies to make more efficient use of the bone and tooth forming minerals, calcium and phosphorus, contained in milk.

Irradiated Milk protects both mother and child through the prenatal and nursing period—and especially helps the mother preserve her teeth.

It keeps infants from getting rickets, the disease of delayed hardening of the bones, which now affects 50 to 75 per cent of all children in some degree.

It helps growing children to develop strong, straight bones and sound, regular teeth.

Because it corrects one of the most universal diet deficiencies, Irradiated Milk is for people of all ages. It is your most nearly perfect food, now given even greater nutritional value.

DOEVILLE DAIRY
TELEPHONE CENTRAL 1000

This seal denotes that our Irradiated Vitamin D Milk and the advertising claims for it are accepted by the American Medical Association, Committee on Foods.

Irradiated with ultra-violet rays under license by the Wisconsin Alumni Research Foundation, under the Steenbock patent (U.S. Patent No. 1680818).

Ask your doctor. He will explain to you in more detail the need for more Vitamin D in your diet and why it is most desirable to get it in your milk. An illustrated booklet FREE, upon request.

Advertisement No. 2
450 lines—3 cols.



Irradiated Vitamin "D" Milk Brings NEW PROTECTION TO MOTHER AND CHILD

● "A tooth for every child" is an old saying, only too true. It is part of the penalty both mother and child so often pay because the mother does not get sufficient Vitamin D along with lime and phosphorus to nourish her child and herself.

Vitamin D is the vitamin which builds calcium and phosphorus into strong bones and teeth.

Because this factor is generally lacking in ordinary foods, expectant and nursing mothers are likely to suffer depletion of their mineral reserve. Not only does the coming child rob its mother of some of the calcium in her system, and leave her with poor teeth and lowered nutrition—but the child itself has only a 50-50 chance of escaping mild rickets, or faulty bone and tooth structure, during the first critical months.

Irradiated Vitamin D Milk protects the mother by giving her a rich supply of the necessary vita-

min in combination with calcium (lime) and phosphorus in the most useful nutritional form.

Clinical tests with children have proven that its use in the infant diet definitely prevents rickets. Leading medical authorities have concluded that Irradiated Milk seems to be the most desirable anti-rachitic.

Mothers should drink an extra quantity of Vitamin D Milk through the nursing period. Children should have it all through the years of growth; in fact, nutrition scientists believe it is valuable to adults of all ages—as a means of avoiding a deficiency of calcium, phosphorus and Vitamin D.

Ask us to start supplying your family today with Irradiated Vitamin D Milk. If you have any hesitancy about its use ask your doctor and be guided by his recommendation.

DOEVILLE DAIRY
ADDRESS AND TELEPHONE NUMBER

This seal denotes that our Irradiated Vitamin D Milk and the advertising claims for it are accepted by the American Medical Association, Committee on Foods.

Irradiated with ultra-violet rays under license by the Wisconsin Alumni Research Foundation, under the Steenbock patent (U.S. Patent No. 1680818).

Irradiation consists of exposing milk to the ultra-violet light to enrich it in Vitamin D. Taste is not affected and food value is increased. The "D" strength is not lessened by cooking. No foreign substance is added.
Send for interesting booklet giving complete facts.

Advertisement No. 5
600 lines—4 cols.

THE ABC'S OF MILK IRRADIATION

Elementary facts regarding a discovery which ranks with pasteurization itself as a great advance in making milk the most nearly perfect human food

QUESTION: What is Irradiated Vitamin D Milk?

ANSWER: Milk enriched with Vitamin D by brief exposure to ultra-violet light.

QUESTION: Why is it considered so important?

ANSWER: Because it offers a pleasant, automatic means of correcting a grave deficiency in our diet—the almost total lack of the "sunshine" vitamin.

QUESTION: Why do we need Vitamin D?

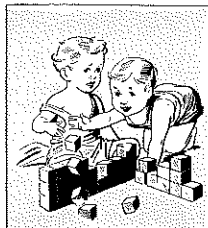
ANSWER: Vitamin D stimulates our bodies to utilize calcium and phosphorus, the minerals that develop and nourish the bones and teeth. Without a sufficiency of Vitamin D, our bodies use these minerals inefficiently.

QUESTION: Do other foods have enough Vitamin D?

ANSWER: Unfortunately, vegetables, fruits, meats and cereals naturally contain no Vitamin D. Of the common food products, egg yolk has the most. Ordinary milk, cream and butter have some but the amount varies with the season, being much less in winter. Oils from the livers of cod and halibut are our richest natural sources.

QUESTION: How about sunlight?

ANSWER: The ultra-violet rays of sunlight are Nature's ordinary source of Vitamin D. But we are robbed of most of this source by indoor life, clothing, shade, smoke, dust, fog and haze, and because the sun is so low in the sky eight months of the year (fall and winter) in our latitude that the Vitamin D is filtered out. Sunlight passing through window glass loses all of its ultra-violet.



Like these toy blocks, bone-building calcium and phosphorus are merely loose building materials, until cemented into a strong, unified structure. In our bodies Vitamin D functions like this cement.

QUESTION: What relationship has Vitamin D to teeth?

ANSWER: The best protection you can give your teeth is proper nourishment. Vitamin D is one of the most important food essentials for good nutrition of the teeth. This vitamin is especially needed early in life. Babies, as you know, start growing their first teeth and even their so-called permanent teeth before they are born. Sufficient Vitamin D, calcium and phosphorus, in the diet of the mother, and, later, of the baby, will help the baby grow even, enduring teeth.

QUESTION: Will Irradiated Milk prevent rickets in children?

ANSWER: Yes, according to clinical tests on babies reported and repeatedly verified by leading medical scientists. The use of properly Irradiated Milk will positively prevent rickets.

QUESTION: What is rickets—is it widespread?

ANSWER: Rickets is the disease of slow or improper development of the bones. Because Vitamin D is so uni-

versally lacking in ordinary foods, from 50 to 75 per cent of all children have rickets, and millions escape it only by the slenderest margin. In acute cases it causes bow-legs, knock-knees, "pigeon-breast", deformed pelvis, bulging forehead, and other handicapping deformities. The use of Vitamin D prevents even the initial stages which generally go unrecognized.

QUESTION: Who should use Irradiated Milk?

ANSWER: It is for all people. It helps women survive the strain of motherhood with sound teeth and bones and effective nutrition for that period. It fosters adolescent growth. For people of all ages, it insures a diet abundant in the essential food factors, calcium, phosphorus and Vitamin D.

QUESTION: "Can we get Irradiated Milk now?"

ANSWER: Just phone us or talk to our driver. We are prepared to furnish this milk in unlimited quantities. Free educational booklet on request. Ask your doctor about irradiated milk and be guided by his recommendation.



DOEVILLE DAIRY

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Advertisement No. 3
750 lines—4 cols.



TO HELP HIM GROW SOUND TEETH

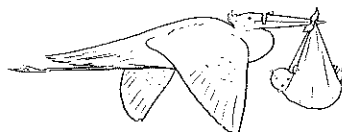
• Vitamin D is one of the food essentials that help toward the formation of sound teeth in your baby. Ordinary cow's milk and other usual foods do not contain enough of this vitamin. Therefore as soon as you must supplement breast feeding, insist on Irradiated Vitamin D Milk. It contains enough Vitamin D to prevent rickets and assure development of sound bones and teeth. The nursing mother should also drink it herself, to protect her own bones and teeth against the devastating consequences of pregnancy.



Free Booklet on Request

DOEVILLE DAIRY
Address and Telephone

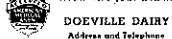
Adv. No. 9
100 lines—1 col.



DOEVILLE DAIRY'S IRRADIATED VITAMIN "D" MILK

Is a Friend
of the Stork

• Expectant and nursing mothers should drink Irradiated Milk generously, because it is rich in calcium, phosphorus and Vitamin D, not only to protect their own bodies from being robbed of lime and phosphorus, but also to give their children sound, straight bones and teeth. Ask your doctor.



Advertisement No. 8
100 lines—2 cols.



GOOD TEETH ARE FORMED IN INFANCY

For sound teeth in later life—give your baby Irradiated Vitamin D Milk every day

Hidden in your baby's toothless little gums are the beginnings of the first teeth—yes, even the permanent teeth! Will these teeth become a real asset in life? The answer depends on whether sufficient Vitamin D is included in the well-balanced diet in infancy.

Leading authorities now agree that Vitamin D is one of the most important food essentials for good nutrition of the teeth. Without this vitamin in sufficient quantity, the body cannot properly assimilate calcium and phosphorus—the bone and tooth building materials.

This important vitamin is generally lacking in ordinary foods and present in far too small amounts in usual milk. That is why every mother should give her baby Irradiated Vitamin D Milk as soon as it is time to supplement breast feeding, and continue giving it all through the growing years. This milk contains enough Vitamin D to insure normal nutrition of the bones and teeth.

Protects Mother's Teeth, too. Beginning long before the baby is born, and continuing through the nursing

period, the mother herself should drink this milk in generous quantities. It will help prevent depletion of her mineral reserves and avoid softening and decay of her own teeth during this period—a frequent consequence of motherhood.

Biggest Family Food Value. People of all ages need far more Vitamin D. Why not take Irradiated Milk for the whole family? It has more food value than ordinary milk because the calcium and phosphorus are "stepped up" in nutritional value. And you get full automatic Vitamin D protection at a fraction of the price you are now paying for this Vitamin in other forms. Ask us for free educational booklet.

3 Simple Rules

1. Reduce milk fast when income shrinks.
2. Cook with milk—for more nutrition and appetizing meals.
3. Insist on Irradiated Vitamin D Milk.

For best health through good nutrition—for utmost economy—build up your meals around one quart per day per child.

DOEVILLE DAIRY IRRADIATED Vitamin D MILK

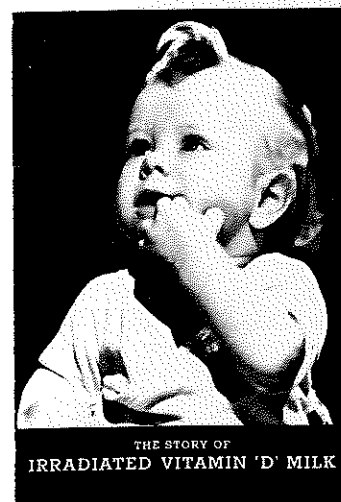
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Advertisement No. 4
600 lines—3 cols.



THE STORY OF
IRRADIATED VITAMIN 'D' MILK

Consumer Booklet
Size 12 pages 7 1/4" x 5 1/4"
Furnished to licensees at cost
Please write for prices

IN THE VAN OF PROGRESS



PRODUCERS CREAMERY

ANNOUNCES THAT

IRRADIATED Vitamin D MILK

WILL BE AVAILABLE IN THE
TWIN CITIES beginning TOMORROW

TOMORROW morning and thereafter the milk supplied by Producers Creamery will be *Irradiated Vitamin D Milk*. In taking this step we are following out a pledge of long standing: that we will give our customers the benefit of every advancement made in dairy science, as quickly as we are assured of its value.

Following the perfection of a practical scientific method of increasing the Vitamin D content of milk, we consulted the physicians of this community and received their unqualified approval.

Then followed our decision to adopt the method; and to make sure that its benefits may be enjoyed by all citizens, rich and poor, we have arranged to absorb the extra cost entailed and are making it available in both grades of milk at no advance in price.

Importance—and Lack—of Vitamin D

You doubtless are not entirely familiar with *Irradiated Milk* and it is no more than right that we tell you briefly about it.

As you know, Vitamin D is the "sunshine" vitamin which in minute quantities stimulates the cells and helps the human body utilize lime and phosphorus minerals, which are essential elements in the formation and nourishment of bones and teeth.

Vitamin D has been known and understood for many years, but we now realize more fully what an important part it plays in protecting babies against rickets or delayed hardening of the bones. In extreme cases it is the cause of bowlegs, under-developed chest, defective teeth and similar conditions.

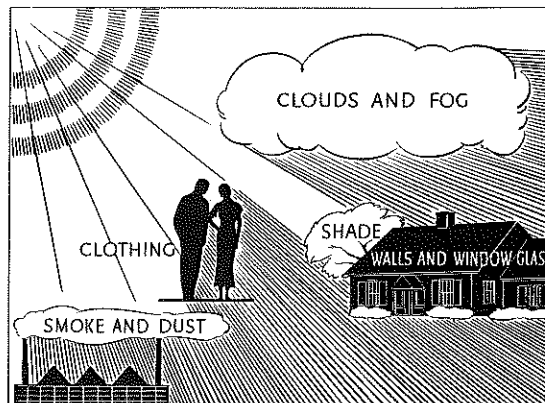
Many leading authorities also believe that sufficient Vitamin D is an essential to sound teeth and increased vigor and resistance in adult life.

Perhaps the most serious fact is our widespread deficiency of Vitamin D and the extent of rickets and other consequences. For every extreme case of visible rickets, there are many milder cases where the evidence is to be seen under the X-ray. Medical authorities have estimated that from 50 to 75 per cent of all children have rickets in some degree.

You wonder why Nature failed us so—for she did not put even a small fraction of enough Vitamin D in our diet. Few foods have even a little. Most foods have none.

Nature did not fail us, really—she simply didn't foresee our sheltered mode of life. She meant for us to receive this vitamin

Important step is taken after majority of physicians in this community endorse the beneficial effects of Irradiated Milk



How Nature's supply of Vitamin D, ultra-violet rays of sunlight, is cut off by weather and civilized life

The thinnest clouds filter out much of the invisible ultra-violet rays that constitute our main natural source of this vitamin. Shade, fog, and dust rob us, smoke likewise. Ordinary window glass lets through absolutely none! And, finally, our clothing is a perfect blanket.

through our skin from the ultra-violet rays of sunlight—and we are robbed of nine-tenths of these rays by clouds, fog, smoke, dust, shade, indoor life, window glass and clothing (see diagram).

The Discovery of Irradiation

In 1924 Dr. Steenbock of the University of Wisconsin began experimenting with artificially produced ultra-violet rays. After long research, he and others proved that our universal food, milk, already so rich in the minerals we need, can be "*irradiated*" or enriched with Vitamin D by exposure to

these rays, without affecting its flavor or food value in the slightest degree. Absolutely no foreign substance is added—the taste is not affected. The vitamin content is not diminished by cooking.

The method of irradiating is simple: milk is exposed in a thin film to the ultra-violet rays of an improved carbon-arc sun-lamp.

Through the Wisconsin Alumni Research Foundation, Dr. Steenbock has chosen to give this discovery to all people. As a licensee of the Foundation, Producers Creamery is assured competent laboratory supervision on the Vitamin D potency of the milk.

Who Needs Vitamin D Milk?

Producers *Irradiated Milk* is for all the people. It supplies children with the necessary calcium, phosphorus and Vitamin D to prevent rickets.

It is vitally important in the pre-natal and nursing diet and in the feeding of the child from birth through the entire period of growth.

Adults need this milk throughout their lives, to help keep their teeth sound and bodily resistance up to normal, in the opinion of many leading medical authorities.

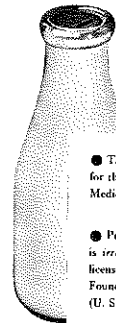
The milk is offered as a *preventive* measure only, *not* curative. Children who already have rickets, and others with special needs, should use it only as it fits into the physician's diet program. If you have the slightest doubt about the use of Producers *Irradiated Milk* by yourself or anyone else in your family, ask your doctor and be governed by his recommendation.

Your Finest Milk Made Better

Producers Creamery owes its large patronage to a policy of furnishing the best milk modern methods can produce. *Irradiated Milk* is simply the best pasteurized milk made even more beneficial. You now have one more reason—and a vital one, indeed—for making milk the foundation of your family diet.

If you are not now a patron of Producers Creamery, you will want to avail yourself of this milk, beginning tomorrow. There is no advance in price.

PRODUCERS CREAMERY
Benton Harbor, Mich. Telephone 6154



● This seal denotes that the advertising for this milk is accepted by the American Medical Association, Committee on Foods.

● Producers *Irradiated Vitamin D Milk* is irradiated with ultra-violet rays under license by the Wisconsin Alumni Research Foundation, under the Steenbock patent (U. S. Patent No. 1680918).



We have kept our Pledge

TO THE PEOPLE OF THIS COMMUNITY

YEARS ago we promised the people of Benton Harbor and St. Joseph that Producers Creamery would always provide them with the purest and finest milk that the most up-to-date methods could produce. Guided always by the opinion of the medical fraternity, we have long been among the first in America to adopt new methods as dairy science progresses.

In making *Irradiated* Vitamin D Milk available to you, at no advance in price, we have again kept our pledge.

This milk is Producers, both Regular and Special, pure, rich, pasteurized milk which has been enriched with Vitamin D by a process known as irradiation, or exposure of milk to ultra-violet rays.

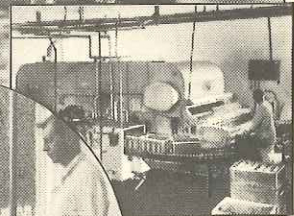
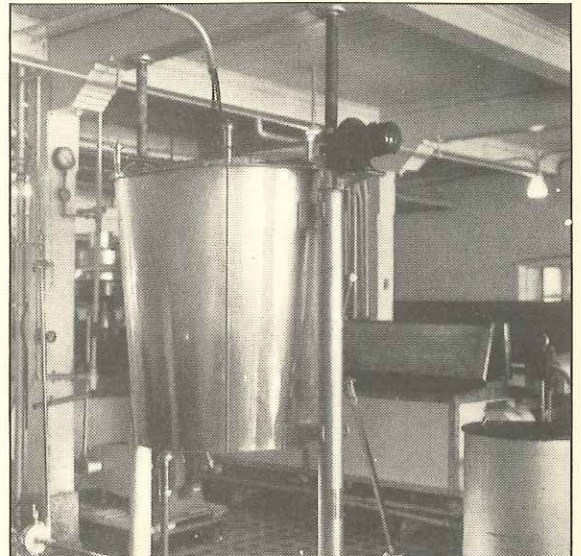
This milk contains sufficient Vitamin D to prevent rickets in children. Rickets is delayed hardening of the bones, and in extreme cases is the cause of bowlegs, poor chest development, and defective teeth. Medical science has proved that rickets is caused by a lack of Vitamin D, which is the vitamin that enables our bodies to properly assimilate the necessary bone-forming minerals, calcium and phosphorus, contained in milk.

The Vitamin D content of Producers *Irradiated* Milk is also sufficient to offset the deficiency in our adult diet. It is vitally important in the prenatal and nursing diet and in the feeding of the child from birth through the entire period of growth. Adults need this milk throughout their lives, to help keep their teeth sound and body resistance up to normal, in the opinion of many leading medical authorities.

No foreign substance has been added to *Irradiated* Milk. The taste is unchanged. The Vitamin D potency is not reduced by cooking. It is just your most nearly perfect food, with a new and vital reason for making milk the foundation of a healthful, happy life.

Sincerely yours,

PRODUCERS CREAMERY



This beautiful building houses one of America's most modern and efficient dairy plants.

The new Irradiator, whose ultra-violet "sun" rays give Irradiated Milk its Vitamin D.

Where milk begins the exact sanitary process which results in Producers high standard of purity and quality.

Bottles are filled automatically — untouched by human hand.

PRODUCERS IRRADIATED Vitamin D MILK

"Ask Your Doctor"

Approved by a large majority of the physicians of Benton Harbor and St. Joseph.
This seal denotes that the advertising for this milk is accepted by the American Medical Association, Committee on Foods.



Irradiated with ultra-violet rays under license by the Wisconsin Alumni Research Foundation, under the Steenbock patent (U. S. Patent No. 1680818).



Help them Grow

STURDY BONES AND SOUND TEETH



One obligation which every mother owes her children is to protect them from the handicap of rickets.

Rickets is a bone disease which in extreme cases results in such conditions as bow-legs, bulging forehead, softening of cranial bones, malformation of chest and pelvis, and weak teeth. Over one-half of America's children have rickets in some degree, according to medical surveys.

In its fight to combat rickets, medical science has proved that Vitamin D is the necessary element, the right amount of which enables the body to properly absorb calcium and phosphorus from our foods.

Sufficient Vitamin D to prevent rickets and help children develop sound bones and teeth is contained in Producers *Irradiated* Vitamin D Milk, which we

have made available to this community in both of our grades at no advance in price.

Producers *Irradiated* Milk tastes no different than Producers delicious, creamy milk has always tasted. No foreign substance has been added. Cooking does not diminish its Vitamin D potency. This milk supplies Vitamin D in a pleasant, automatic form, along with the normal concentration of the minerals the growing child needs.

Irradiated Milk is for all. Children need it from birth on through the entire period of growth. It is especially important in the pre-natal and nursing diet.

And many medical authorities are of the opinion that adults need this additional Vitamin D throughout life, because of its scarcity in our diet.

It offers you one more reason—and a vital one—for making milk the foundation of your diet.

PRODUCERS *IRRADIATED* Vitamin D MILK

Ask Your Doctor

- This seal denotes that the advertising for this milk is accepted by the American Medical Association, Committee on Foods.
- Approved by a large majority of the physicians of Benton Harbor and St. Joseph.



- Irradiated with ultra-violet rays under license by the Wisconsin Alumni Research Foundation, under the Steenbock patent (U. S. Patent No. 1680818).

TO PROTECT YOUR CHILDREN FROM RICKETS

We brought Irradiated Milk TO THIS COMMUNITY

Many mothers would be shocked to know how many babies suffer from rickets. Medical surveys indicate that actually more than 50 per cent of all children have rickets in some degree.

Rickets is the disease of delayed hardening of the bones. In extreme cases it results in bow-legs, poor chest development, "pigeon breast," bulging forehead, softening of cranial bones, defective teeth and similar conditions which handicap the child for life.

In Producers Irradiated Vitamin D Milk your child has the calcium and phosphorus in balance with enough Vitamin D to prevent rickets and insure normal growth and sound teeth.

The Vitamin D permits his body's utilization of the normal amount of these minerals which he needs so badly. And including this

vitamin in the diet becomes a pleasant automatic routine involving merely the drinking of delicious milk.

Producers Irradiated Vitamin D Milk is just the Twin Cities' favorite pasteurized milk which has been enriched with Vitamin D by exposure to ultra-violet light. No foreign substance is added. The flavor is unchanged. Every quart is enriched with a uniform amount of the "sunshine" vitamin.

This milk is for all the people. It is especially beneficial in the pre-natal and nursing diet and in the feeding of children from birth on through the entire period of growth.

Why not begin this milk today? There is no advance in price. Phone 6154, Producers Creamery. Or just give your order with any of our drivers.

PRODUCERS IRRADIATED VITAMIN D MILK

"Ask Your Doctor"

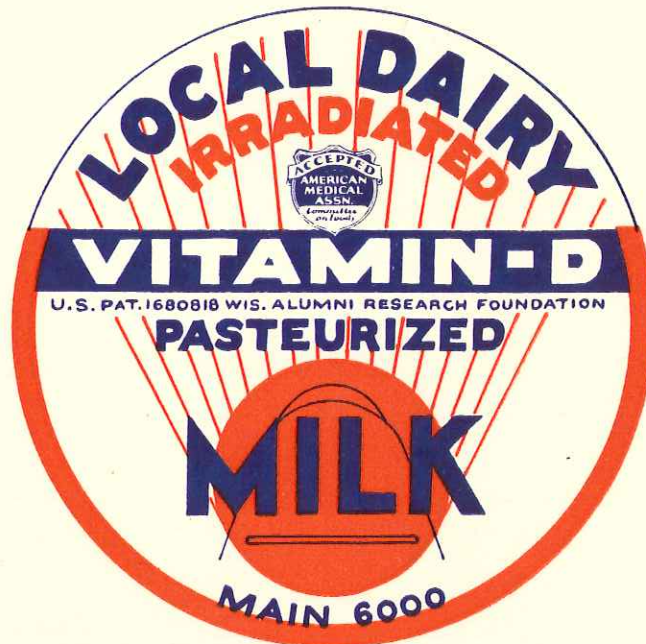
● Approved by a large majority of the physicians of Benton Harbor and St. Joseph.

● Irradiated with ultra-violet rays under license by the Wisconsin Alumni Research Foundation under U. S. Patent No. 1680819.

● This seal denotes that the advertising for this milk is accepted by the American Medical Association, Committee on Foods.



Suggested Bottle Cap Design *for* IRRADIATED VITAMIN D MILK



Bottle caps for *Irradiated* Vitamin D Milk should be distinctive in appearance. This design has that quality and is suggested as an aid to customers in preparing their own cap designs.

The following points should be noted:

Cap must show patent information and word "Pasteurized" as indicated above.

The A.M.A. Seal of Acceptance may be incorporated in the design only if authorized by the American Medical Association, Committee on Foods. (If you wish to use the seal and are in doubt as to how to proceed, write us.)

Any local requirements as to grade, butterfat, day of week, etc., must be met.

Special cap designs will be suggested to purchasers of CP Milk Irradiators upon request and upon receipt of samples of cap now used on grade of milk which will be irradiated.

THE CREAMERY PACKAGE MFG. COMPANY

1243 W. Washington Blvd., Chicago, Ill.

Branches in Principal Cities