

Why Milk Pasteurization?

The Harvest is a Barren One

By Jean Bullitt Darlington

IN the first article in this series, "Sowing the Seeds of Fear" (THE RURAL NEW-YORKER, March 15, 1947), the false and misleading propaganda against raw milk was analyzed and shown to be without any foundation in fact. The analysis was directed particularly to the articles published in *Ladies Home Journal* (December 1944), *Coronet* (May 1945), *The Progressive* (July 15, 1946), and *The Reader's Digest* (August 1946). The second article, "Plowing Under the Truth" (THE RURAL NEW-YORKER, May 3, 1947), revealed some of the startling omissions, innocent and otherwise, indulged in by these writers, as a result of which they attempted to distort or conceal the nutritional superiority of raw milk.

Having disposed of both this positive and negative propaganda, we now come to an analysis of the final objective urged by these propagandists—universal milk pasteurization, and the adoption of the U. S. Public Health Service Milk Ordinance and Code as a means to that end. Both these goals are enthusiastically urged by Milton Mackaye (*Ladies Home Journal*) and Holman Harvey (*The Progressive* and *The Reader's Digest*), but Dr. Harold J. Harris (*Coronet*), a member of the

American Medical Association, while favoring universal pasteurization, makes no mention of this Ordinance. Mr. Mackaye says:

"The U. S. Public Health Service has a Model Ordinance on milk sanitation which any community can get by writing for it but the situation all over the country [presumably by the absence of the ordinance] is still dangerously spotty." (Brackets mine).

Mr. Harvey's support of the Ordinance is a little more direct than Mr. Mackaye's. He says:

"Back in 1923 the U. S. Public Health Service drew up a reasonably liberal standard Milk Ordinance which communities might voluntarily adopt to protect their milk supplies. The ordinance established basic sanitary procedures and set up and defined various standard grades. . . . It would be a big step forward if every state adopted the standard Milk Ordinance."

Of course the reader inference desired by both these men is that in those communities where this Ordinance is in effect, there can be no danger of people contracting milk-borne disease, a conclusion which, as will presently be shown, is not true. Mr. Harvey does, however, admit the present discouraging status of the Ordinance in these words:

"Today, despite the unremitting efforts by the Public Health Service to induce municipal authorities to adopt this fundamental ordinance, it has been accepted by only 1,172 communities, fewer than one in five. They have, however, a population of 26,770,000. . . . Even in those communities that have protected their citizens by adopting this ordinance, the record of enforce-

ment is shockingly low. In no year have more than 164 of them — 14 per cent — had better than 90 per cent enforcement. In many cases the ordinance, once adopted, has lapsed with time and is today a dead letter." (*The Reader's Digest*, Aug. 1946, condensed this quotation).

He then attempts to explain this failure as the result of "changes in local administrations, pressure from farmers' groups, and simple inertia." The actual fact is that the U. S. Public Health Model Ordinance is a poor regulation that tends to encourage inferior milk production. An examination of the Ordinance itself demonstrates this very clearly. (53)

This Ordinance makes provision, not for one, but for three grades of raw milk: Grade A raw*, requiring, among other things, the tuberculin and Bang's tests for cattle, which insure the protection of farm workers as well as milk drinkers from tuberculosis and undulant fever; Grade B raw**, with no requirement for Bang's testing of cattle, and therefore no protection for either of these groups; and finally, Grade C raw milk, which

*The test of clean milk and careful, sanitary milk production is the number of bacteria the milk contains. In all milk regulations, there is a bacteria count limit set which will confirm the apparent compliance with the regulations as prescribed. The allowance for Grade A raw set by the Model Ordinance is 50,000 bacteria per cubic centimeter.

**Grade B raw is permitted to have a count as high as 1,000,000 bacteria per c. c.; a disgraceful score for any farm producing milk.

has no sanitary requirements whatsoever not even to Bang's testing nor bacteria count.

In view of the tremendous effort that has been made by the U. S. Public Health Service to totally eliminate the sale of all raw milk, what explanation is there for this unbelievable inconsistency of making provision for these inferior raw grades? It is to be found in the Ordinance (page 96) in the following words:

"Pasteurization is the only measure which if properly applied to all milk will prevent all milk-borne disease. . . . It may be asked, if the above is true, why the Public Health Service Milk Ordinance does not require the pasteurization of all milk. The answer is simply that if the ordinance were so worded only a small percentage of cities could be induced to adopt it. It was considered wiser to frame the ordinance so as to make it adaptable not only to cities which were ready for pasteurization of all milk but also to the many other communities in which there still persists a strong sentiment against pasteurization." (53)

This is a typical example of a cowardly lack of conviction on the part of the U. S. Public Health Service, and the evidence shows it has reaped its own rewards. Certainly there can be no defense, logical or ethical, for encouraging something that it is desired to eliminate, and the fact that "fewer than one in five communities" have adopted the Ordinance after it has been urged for the past 23 years, should have long ago convinced its sponsors of the fallacy of their own position. So much then for the raw milk provisions of the Ordinance.

As to the regulations in the same Ordinance affecting pasteurized milk, we find severe condemnation from no less an authority than Dr. C. E. North. Dr. North was a member of the National Commission on Milk Standards which pioneered from 1910 to 1921 in the field of milk grading. This is what Dr. North has to say of the Ordinance in relation to pasteurized milk:

“The Commission on Milk Standards, and the cities and States following its recommendations, make the test for bacteria on the dealer’s raw milk before pasteurization the critical test on which the grading of milk is based. The character of the mixed raw milk in the dealer’s possession decides its grade. *In the U. S. Public Health Service ‘Milk Ordinance and Code’ no standard for the dealer’s raw milk is required. . .* The most cardinal of all principles agreed upon by the authorities who originated Grade A milk was that the determination of the grade into which any milk is classed must be based on the bacterial plate count of the raw milk before pasteurization. It was recognized that pasteurizers often make very dirty milk look like clean milk. All bacteriologists on the Commission agreed that tests of the milk after pasteurization were a most unreliable indicator of the bacteria in milk before pasteurization, since many species are easily killed by heat. On the other hand, the test of raw milk before pasteurization, is the most certain of all indicators of the contamination of milk in the production and handling and of its age and the temperature at which it has been kept. To substitute inspections of dealers’ machinery and score cards for this test only dodges the real issue. If sanitation means anything, it means technique. If sanitary technique has been practiced, it should result in sanitary milk. Therefore the test of the milk is the test for sanitation. A standard for the raw milk before it is pasteurized is a standard for sanitation.” (54) (Italics mine).

With such a full and complete statement from so eminent an authority as Dr. North on the woeful lack of adequate supervision of milk produced for pasteurization, there is nothing further that need be said, other than to point out that the U. S. Public Health Service has done nothing to meet the criticism, nothing to follow the constructive suggestions, made by Dr. North. It is evident therefore that this Ordinance does little, if anything, to insure clean milk production or, as a matter of fact, to insure the very objective for which it has been so widely advocated, namely, universal pasteurization.

Frankly, however, it matters very little whether or not the Ordinance is a step in the direction of pasteurization, because pasteurization is not, from the standpoint of national health, a proper goal anyway. This is readily ascertainable from the Public Health Service's own annual reports. (12) These reports, compiled and published annually, consist of a column table, giving the kind of disease, the number of cases in, and deaths from each outbreak, and other pertinent data, including the kind of milk or milk product to which such disease has been attributed, and a column designating whether such milk was raw or pasteurized.

The designation "Raw" appearing in the column headed "Raw or Pasteurized" indicates that the reported outbreak was attributed to the consumption of milk from:

(a) Any raw milk produced for sale by a licensed milk producer, complying with regulations and inspections which vary from city to city and from state to state, from the lax to the stringent;

(b) Any raw milk from privately owned cows and goats, which are under no inspection or control whatsoever, with the single exception of tuberculin testing, made compulsory by Federal statute;

(c) Any raw milk which may have been consumed on farms which are producing milk for pasteurization, with few or no standards for clean production; or

(d) Any raw milk of still lower grade, suitable only for manufacture.

The designation "Pasteurized" indicates that the reported outbreak was attributed to milk all of which is under inspection and control; for pasteurization is rarely, if ever, done unless official action requires it.

The cases reported are shown to have come from contamination not only in the milking, but in the processing, bottling, distribution and manufacture of over 50 billion quarts of milk a year, the product of over 25 million cows, and many goats, produced on four and a half million farms and distributed by thousands of dealers to 140 million people in the United States, Hawaii, Alaska and Puerto Rico. In addition, disease is reported which may have been caused through contamination by handlers in all of the nation's 25 million homes and in its many institutions.

It will be a rewarding experience and a valuable antidote for any frightened reader of milk propaganda to examine these Public

Health reports carefully. If the scare technique employed by Messrs. Mackaye, Harris and Harvey has led some to the belief that pasteurization is the only way to insure a disease-free milk supply, he may be surprised to learn that many milk-borne diseases are traced to pasteurized milk; some of them being traced to improper handling and "under pasteurization," and others to milk which was contaminated prior to pasteurization, so that even proper pasteurization did not prevent them.

According to the latest of these annual reports, there were 1,492 cases and nine deaths from pasteurized milk in 1945, while from raw milk there were 450 cases and six deaths. Here are the figures taken from the 1945 report for comparison with the 1944 figures previously published in **THE RURAL NEW-YORKER** (March 15, 1947, p. 233):

Kind of Milk	Cases		Deaths	
	1945	1944	1945	1944
Raw Milk.....	450	430	2 diphtheria, 4 typhoid	1 typhoid
Pasteurized Milk.....	1492	224	9 food poisoning	
Past. and Raw.....	0	3		
Ice Cream Raw.....	9	24		
Ice Cream Past.....	0	145		
Ice Cream Unknown....	0	65		
Hospital Formula.....	9	43	1 gastroenteritis	2 diarrhea
Evaporated Milk.....	0	10		
Cheeses	315	505	1 food poisoning	17 typhoid
	2275	1449	17	20

Is not this latest report of the U. S. Public Health Service itself a more than sufficient answer to the oft repeated propagandist refrain that pasteurization will prevent all milk-borne disease? If the further argument be advanced that pasteurization, if properly applied,

will always be a cure-all, attention is called to one of a number of cases which clearly refute this claim, and which is also included in the 1945 report. Concerning an epidemic of 300 cases of food poisoning in Phoenix, Arizona, the report reads: "Pasteurization charts for July 26 show milk was properly pasteurized and leads to assumption that toxin was produced in milk while it was stored without proper refrigeration and was not completely destroyed by pasteurization." Also included in the same 1945 report is a single epidemic of gastroenteritis in Great Bend, Kansas, in which there were 468 cases and nine deaths traced to the drinking of pasteurized milk due to "insanitary conditions in dairies, unsterilized bottles, improper pasteurization." That single epidemic in which more cases and deaths occurred than were attributed to raw milk in the entire year, serves to point out the utter stupidity of current milk ordinances which provide lower sanitary requirements for the production of milk which is to be pasteurized than for milk which is to be consumed raw.

According to U. S. Department of Agriculture milk statistics for 1945 (55), there were over 27 billion quarts of milk consumed in fluid form, of which approximately 18½ billion quarts were pasteurized and 8½ billion were consumed raw (this includes fluid milk consumed on farms where produced).

On the basis of these figures, the relative frequency of milk-borne disease can be easily determined by dividing the number of raw and pasteurized quarts consumed by the number of diseases traced to raw and pasteurized milk respectively. We find that there was one case of disease for every 12,400,000 quarts of pasteurized milk consumed, and one case of disease for every 18,900,000 quarts of raw milk consumed. Not only is it comforting to learn that the danger of contracting any milk-borne disease, which has been made to appear so great, is, in reality, so infinitesimally slight in spite of the manifold opportunities for contamination, but what is so particularly reassuring is the discovery that in 1945 one could have drunk 6,500,000 more quarts of raw milk than pasteurized without any fear of being "stricken."

It is indeed a sobering thought that, by constant and continual repetition of such false and misleading information as has been put forward by the pasteurization propagandists in the articles examined and in hundreds more like them, not only the public, but the medical profession as well, has been duped into endorsing pasteurization so that it is now applied to 85 per cent of the total fluid milk supply. In the face of the stupendous nutritional loss which is inflicted thereby, the result, while a temporary victory for the synthetic or compensatory school of nutrition, is truly a national tragedy, because the percentage of pasteurization is the inevitable measure of the inferiority of a milk supply.

This loss is terribly serious because it occurs, not once in 19 million quarts, not sometimes, or infrequently, or just now and then, but in every quart of

milk that is pasteurized. Each one of the 18½ billion quarts sold as pasteurized milk in 1945 was nutritionally deficient. It was robbed of a long list of valuable nutrients. (THE RURAL NEW-YORKER, May 3, 1947, p. 319). The calcium loss alone amounted to 2,819,346 pounds in one year! What, too, of the 50 per cent loss of vitamin C and of all the other elements — vitamins, minerals, enzymes — known and unknown? All are squandered with like profligacy. And for what?

So much space was devoted to misinformation about undulant fever (medically known as brucellosis), in the propaganda articles under discussion, that it is advisable and necessary at this point to have some authentic information on the subject.

The fact that undulant fever is a serious disease is succinctly stated by a California State Department of Health publication:

“Brucellosis in California (Undulant Fever) by Harlin L. Wynns, M. D., Chief, Bureau of Epidemiology.

. . . While few people die of this disease, nevertheless it is a serious disease because of the fact that it has a tendency to be chronic, of long duration, and convalescence often extends into months and even years.” (56)

As to the extent of the disease, let us turn to Iowa, the leading hog producing State, which has the unenviable record for the most cases of undulant fever. Dr. Carl F. Jordan, Iowa State Department of Health, states that from 1930 through 1941 a total of 20,594 cases of undulant fever were reported in the entire United States, an annual average of 1,716 cases, and that during the same period there were 1,887 re-

ported cases in Iowa, an annual average of 157 cases. (57) Iowa, therefore, with barely two per cent of the national population, had almost 10 per cent of the cases of undulant fever reported.

Next, and by far the most important, is the method by which brucellosis is transmitted from animals to man. There are several well known authorities who have spoken clearly on this point. A. V. Hardy, also of Iowa, has stated:

"It is still evident that in the United States the incidence of recognized brucellosis in man tends to vary directly with the extent of the hog-raising industry. . . It was previously assumed, as a result of the studies of the Mediterranean Fever Commission, that brucellosis was acquired through the ingestion of infected raw dairy products. It has since been established through experimental study and the interpretation of epidemiological observations that the infection may readily be acquired through cutaneous contact with infective secretions, excretions, or tissues. This appears to explain the ease of infection of bacteriologists, who are generally able to avoid the ingestion of those organisms with which they work but can scarcely hope to prevent entirely the contamination of fingers and hands. The high incidence of infection in packing-plant employees is readily understood when it is known that *Brucella* may penetrate the normal or minutely abraded skin. Likewise the high rate of infection in men on the farm, as compared with the women, can be explained only as a result of the more common skin

contamination by infective discharges of cattle or hogs." (58)

Dr. J. Howard Brown, of Johns Hopkins, has recently written:

"Although hogs are resistant to *Brucella abortus*, cattle in close association with hogs occasionally become infected with *Brucella suis*. In the two milk-borne outbreaks reported by the U. S. Public Health Service (1941 and 1942) as due to *Brucella suis*, the incriminated cows had been allowed to run with infected hogs in the same lot." (8)

Dr. E. G. Hastings, of the Department of Bacteriology, Wisconsin College of Agriculture, says:

"It is necessary to keep in mind that the organism causing practically all the cases of contagious abortion [Bang's disease] in cattle is a member of a family which has two other branches, one of which is found in the goat and sheep and the third in swine. . . the number of cases of undulant fever in man due to the bovine [cow] form of the organism is less than the number due to either of the other forms. . . If the bovine form of *Brucella* has a great ability to cause disease in man, the greater number of cases of undulant fever should occur in the dairy regions. The data gathered shows that the incidence of the infection in man has little if any relation to the intensity of dairying, but it does have a relation to the swine industry." (59) (Brackets mine).

In a recent article in the *Holstein-Friesian World*, Dr. George H. Conn, quotes Dr. B. A. Beach, Professor of Veterinary Medicine, University of

Wisconsin, as to the percentage of cases of undulant fever that could be proven to be caused by milk infection from the cow. In answer to the query, Dr. Beach's reply, as quoted, was:

"I do not believe the answer to that question is definitely known. We do know, however, that a percentage of the cases of undulant fever are due to *Brucella abortus*. Whether any of them came through the milk has as far as I know, never been demonstrated. Considerable work has been done by the Iowa Department of Health. The majority of their cases are due to the suis [hog] type." (60) (Brackets mine).

It is therefore the opinion of these competent, scientific authorities that few cases of undulant fever are known to have been caused by drinking raw milk; that most cases are caused by direct contact with animals; and that undulant fever is an occupational disease and therefore primarily a problem of the livestock industry, not a milk problem.

How, then, can undulant fever be prevented? The small number of bovine cases contracted through contact with cows and the still smaller number possibly contracted through drinking raw milk would naturally be eliminated if the cows were disease free. The Bureau of Animal Industry of the U. S. Department of Agriculture has for many years been developing methods calculated to conquer Bang's disease in cows, and with a fair measure of success. Herds under its "test and slaughter" method are tested over a period of time and when determined to be Bang's free are known as "approved," the test being given annually

thereafter or as deemed necessary. Any reactors found through the Bang's test are removed from the herd and slaughtered, and the government indemnifies the owner for the loss to a certain extent. This is somewhat similar to the method used for the tuberculin testing of cattle which is now universal and compulsory.

The drastic "test and slaughter" method has latterly been supplemented by the "calfhood vaccination" plan, by which it is hoped to establish immunity to the disease in the cow's early life, just as human beings are protected against smallpox or diphtheria. Time will test the ultimate success of the current vaccination plan which presently is producing good results. If it does not measure up to its initial promise, other and improved methods of immunization will undoubtedly replace the ones advocated today. At any rate one thing is certain—total eradication of the disease in cows will automatically protect human beings from undulant fever.

The pasteurization of milk, on the contrary, will not prevent any of the cases of undulant fever contracted by occupational workers which, as already shown, make up the great majority of cases. Milk regulations which advocate pasteurization as the cure-all and neglect to require the much needed Bang's testing, therefore serve only to promote the disease by removing one incentive to Bang's testing and making the dairymen feel that such a safeguard is unnecessary, hence unimportant.

From the health standpoint, as in the case of tuberculin testing, insistence on Bang's testing of all herds producing milk, whether or not it is to be pasteurized, would solve the problem

of bovine undulant fever. It is quite evident that the propaganda which is put forth to emphasize the danger of disease to the few (milk drinkers), while ignoring the danger to the many (occupational workers), is motivated by considerations other than health.

If the pasteurization of milk causes so much nutritional loss and at the same time offers no greater security from milk-borne disease than is shown by the 1945 report of the U. S. Public Health Service, has it then no merit? Is there no place for the pasteurization of milk in the scheme of things? In one of the ablest books yet written about the milk industry, Dr. Roland W. Bartlett, Professor of Agricultural Economics, University of Illinois, cites the study made on milk ordinances by Dr. M. J. Prucha, Professor Emeritus in Dairy Bacteriology, University of Illinois. (61) Dr. Prucha, recalling the early days of pasteurization, has this to say:

"There was much opposition to pasteurization of milk and at best, it was looked upon as a temporary expedient to obtain a safe milk supply until the time when the dairy industry would learn to produce clean and safe milk." (Italics mine).

Thus pasteurization was originally adopted as a *means* to a proper end, and then defended only as a temporary expedient. It was naturally assumed that the dairy industry would discontinue the destructive process of pasteurization when it had learned how to produce a clean and safe milk supply and as its acquired knowledge was put into effect. It did not take the industry very long to learn how to produce a clean and safe milk supply,

and the knowledge has been on hand and available for many years. Dr. North (54, p 128) recalls the discovery of the principles involved, and the illuminating fact that the technique of sanitary milk production can be transferred to any dairy farm, together with the even more encouraging fact that it will be practiced by any dairyman in return for a bonus. Looking back, Dr. North describes these findings in the following words:

“Here was a perfect mechanism for control of milk sanitation that could be expanded indefinitely. The simple sanitary technique, the bonus, and the laboratory test, each played their part in a perfect system of control.”

Much of the credit for the successful application of these principles to milk production on a large scale can be given to Dr. North for his untiring efforts to promote it under the title of Grade A. Further, he confirms this fact that the technique can be applied on a large scale and expanded indefinitely, when he cites the case of New York City where “politics ignorant of the meaning of Grade A destroyed this clean milk supply.” A few years ago, there were one million quarts of clean milk of Grade A quality coming into New York City from 6,000 dairy farms.

Clean and safe milk is vital to health. Opposed to this obvious fact, the propagandists for pasteurization have made it appear that it is not important to produce clean and safe milk. This is not true. Nor is it true, as they would also have the public believe, that it is economically impossible. Immunity from Bang's disease and sanitary milk handling constitute the simple answer

to the pasteurization fanatics. When pasteurization was first put into effect, every possible effort was exerted by the U. S. Department of Agriculture and the dairy industry to determine just what was necessary for clean and safe milk production. After extensive experiments it was discovered what those requirements should be, the four most essential factors being: 1. Sterilized utensils. 2. Clean cows with clean udders and teats. 3. The small-topped milk pail (the newer milking machines have the pail completely covered). 4. Refrigeration at 50 degrees after milking. Other important factors were found to be clean and healthy milk handlers and unpolluted water supply. Wherever these recommendation have been observed, the results have been excellent. In fact, through these experiments it was learned that any farm and any farmer can, with proper incentive, produce clean milk.

The same ideas underlay the original development of Certified milk under the Medical Milk Commissions, and numerous local examples of a successful application of these principles of clean and safe milk production can be found all over the country, whether it be called Grade A, Certified, Inspected, Approved or Guaranteed. Care must be taken, however, to distinguish Dr. North's principles of safe milk production from those in the U. S. Public Health Service Ordinance, and others like it, which are designed primarily to promote pasteurization.

Pasteurization has been amply demonstrated to be a retrograde process. It may be useful when adopted only as a temporary means to a worthy end, but it can never be justified as an end in itself.

This is precisely the dilemma which faces its promoters. Because their position cannot be defended by logic or reason and thus appeal to man's higher faculties, these promoters have been obliged to resort to the scare technique, appealing to man's more primitive instinct of self-preservation. Since the truth about raw milk and pasteurization, when brought into the open (as it never is but as has been in these articles), does not even provide sufficient evidence to warrant exploitation through fear, the evidence has to be either manufactured, made up out of whole cloth, misrepresented, or so distorted that the real truth will go unrecognized.

Very properly, it may here in conclusion be asked; "Why Milk Pasteurization?" Pasteurization is destructive of many of the essential nutritional values in milk. Nor can it be defended as a preventive of undulant fever because it does not even pretend to meet the danger of that disease where its incidence is greatest. The only possible defense that could ever have been offered for pasteurization is that it did act as a temporary expedient pending the acquisition of more knowledge of methods insuring a safe and clean supply. That defense cannot, however, be availed of today when the requisite knowledge is at hand but for some reason has been prevented, or at least delayed, from being properly and adequately applied to the benefit and for the health of the entire nation.

When, as in the case of milk, the truth is plowed under and only seeds of fear are sown, the harvest is a barren one for those who are most dependent upon it. On the other hand,

the harvest is rich indeed for the monopoly interests, whether they be engaged in business for a profit or fanatically devoted to the cause of government control.

(The End)

REFERENCES

53. Milk Ordinance and Code, Public Health Bull. No. 220 (1939 Edition); Fed. Sec. Agency, U. S. P. H. Service, Washington, D. C. (1939).
54. North, Chas. E., M. D. "Milestones in Milk Sanitation"; 18th Ann. Report, Pa. Assn. of Dairy Sanitarians, p. 137, Troy, Pa. (1942).
55. "Milk Facts," 1946-1947 Ed., Milk Industry Foundation, N. Y. C.
56. California's Health, Vol. 2, No. 1, p. 1 (July 15, 1944).
57. Proc. 48th Ann. Meeting U. S. Livestock Sanitary Assn., p. 185, Chic., Ill. (Dec. 1945).
58. Hardy, A. V., "Huddleson, I. F., Brucellosis in Men and Animals"; The Commonwealth Fund, New York, (1943).
59. Hastings, E. G., "Undulant Fever and Bang's"; Hoard's Dairyman, Vol. 88, No. 23, p. 702-3 (Dec. 10, 1943).
60. Conn. George H., "Milk and Undulant Fever," Holstein-Friesian World, (Aug. 3, 1946).
61. Bartlett, R. W., "The Milk Industry," p. 254; Ronald Press Co., N. Y. C. (1946).

Reprint No. 28-B
Lee Foundation for Nutritional Research
Milwaukee 3, Wisconsin

July 5, 1947