

***Why Milk Pasteurization?
Plowing Under the Truth
By Jean Bullitt Darlington***

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By Jean Bullitt Darlington

MY first article, "Sowing the Seeds of Fear," that appeared in *THE RURAL NEW-YORKER* of March 15, 1947, dealt with the milk pasteurization propaganda that was published in *Ladies Home Journal* (December, 1944); *Coronet* (May 1945); and *The Progressive* (July 15, 1946) and *The Reader's Digest* (August, 1946). In these articles, the fourth being a condensation of the third, all the authors hewed diligently and slavishly to the pasteurization "party line" of repeating, with trimmings of gross exaggeration, the usual false facts and figures, all of them outworn, with only one aim in view: to create fear in the public mind about the effects of drinking raw milk.

There is no excuse for such misrepresentation, but even more reprehensible than this "positive" propaganda is the insidious "negative" propaganda that has been indulged in by these writers. By "negative" propaganda I mean the total disregard of the great body of evidence obtained through scientific study over the years, which establishes without question the superior nutritive value of raw milk over that which has been pasteurized.

Here, for example, is what Milton Mackaye said in his *Ladies Home Journal* article:

"There is *no plausible argument* against the pasteurization of milk . . . individual tastes for raw milk can safely be chalked up to obsession. There is no change in flavor; *nor is there any decrease in food-value content.*" (italics mine)

In his article in *Coronet*, Dr. Harold J. Harris carefully avoided this all-important matter of the nutritional superiority of raw milk. However, Holman Harvey, writing in *The Progressive*, stated bluntly:

"For years medical men generally held the opinion that pasteurization destroyed vital nutritional elements in milk, and especially opposed the use of pasteurized milk for children and invalids. Modern investigation has largely dispelled that fear, and today the *Public Health Service*, supported by an overwhelming majority of the medical profession, says that pasteurization has 'no significant effect on milk's food value . . . the only vitamin affected is C, which modern children can receive in plentiful supply from fruit juices.'" (italics mine)

The Reader's Digest condensed that version and then in both articles Mr. Harvey gave a single example in human nutrition to support his and the U. S. Public Health Service's unfounded position:

"In feeding tests conducted a few years ago among 3,700 children in ten states, children given only pasteurized milk gained slightly more in weight and height than those given raw milk. . . ."

It is quite evident that Mr. Harvey did not consult the report of the survey to which he refers, for it could not, by any stretch of the wildest imagination, be called "feeding tests." It was simply a survey conducted by the U. S. Public Health Service which consisted in

weighing and measuring 3,700 children, between the ages of 10 months and six years, in 39 cities in 10 States, and attributing their then reported height and weight to be the result of whether or not they had had raw milk for approximately one half of their life span, regardless, among other things, at which end of their life span (10 months to six years) they might have had the raw milk. (18) The validity of the questionnaire and the result of the survey depended entirely upon the answers received from parents, which, by the very nature of the questions asked, could not possibly be relied upon. The parents of the 10 months old children might conceivably have answered with reasonable accuracy just how long their infants had been fed certain foods, but to have carried such innumerable, trivial details in their heads, as these parents were assumed to have done, and with precision, for up to six years, would presuppose a perfection of memory impossible of human attainment.

Having determined upon a policy of pasteurization promotion rather than a program of clean, raw milk production, the U. S. Public Health Service was so hard pressed for evidence to support its unsound position that it had to conduct its own unverified survey. It was in no sense a

[Ed. — This is the second of a series of three articles. The third part will appear in an early issue.]

controlled experiment and it was certainly not a "feeding test," as Mr. Harvey would have had his readers believe. Yet the survey has been used time and again by all of the propagandists as a convenient subterfuge to obscure and confuse the real issues.

To make matters worse, Mr. Harvey followed the arbitrary policy of the U. S. Public Health Service in deliberately brushing aside the massive data of scientific findings in respect of which there has never been any real challenge based on the merits. Every student of milk knows that there are many convincing health and economic arguments against the pasteurization of milk and, Messrs. Mackaye and Harvey to the contrary notwithstanding, that the most important of all is that it **does** decrease the food value. Let us then consider some of the scientific evidence that is available to show that raw milk is superior nutritionally to pasteurized milk. Here are a few of the losses in nutritive value which have been determined by the chemical method or by biological assay to show that raw milk is superior nutritionally to pasteurized milk:

1. Pasteurization causes a loss in the soluble *calcium* and *phosphorus* contents (19), and thereby affects the metabolism of *calcium*, *phosphorus* and *nitrogen*. (20) There is six per cent less *calcium* available after pasteurization. (21)
2. Pasteurization causes the disappearance by volatilization of 20 per cent or more of the total *iodine*. (22)
3. Pasteurization destroys 50 per cent of the

vitamin C content in milk. (23) Fresh raw milk contains from 20 to 25 milligrams of *vitamin C* per liter. (24)

“ . . . the cows of the country produce as much *vitamin C* as does the entire citrus crop, but most of it is lost as result of pasteurization.” (25)

4. Pasteurization destroys 25 per cent of *vitamin B₁*. (26)

5. Pasteurization destroys from nine to 16 per cent of *vitamin B₂*. (27)

6. Pasteurization totally destroys or materially reduces all of the *enzymes* in milk. (28) Those affected are: *protease, lactase, diastase, lipase, salolalase, catalase, peroxidase, aldehydrase* (29) *amylase* and *phosphatase* (30)

7. Pasteurization destroys the guinea pig “*anti-stiffness*” factor in cream (31), and destroys the monkey “*anti-anemia*” factor in milk. (32)

8. Pasteurization destroys an “important unidentified growth-promoting material” in milk, known as “*factor X*” of the U. S. Department of Agriculture studies. (33)

9. Pasteurization destroys the *germicidal* property of milk. (29)

It is clear from this brief list of nutrients which are *known* to be damaged in whole or in part by pasteurization, that the position of the U. S. Public Health Service and Mr. Harvey, that “only *vitamin C*” is lost, and the claim by Mr. Mackaye that there is no decrease in food-value content, are both untenable and unworthy of any credence.

Complete authoritative data are not available on the comparative importance of these nutrients for the very good reason that there are no data as to how many nutrients there are in milk nor of the role or function each performs; and for the further reasons that a number of nutrients that have been found in milk have not as yet been identified, that

many, known and identified, have never been assayed, and that still many others remain a complete mystery. If all of the nutrients in raw milk could be identified and all of their functions ascertained; if it could be proven that these functions are unimpaired by the process of pasteurization, which by present pasteurization methods obviously could not be proven, then, and only then, could any person or organization be justified in making the sweeping claim that Mr. Mackaye makes, on no authority but his own, and Mr. Harvey likewise, on the somewhat skimpy authority of the U. S. Public Health Service.

No one can deny that at the present time there is a woeful lack of knowledge of human requirements for many of the vital known and unknown nutritional factors and the possible effects of their underprovision. As stated in the *U. S. Dept. of Agriculture Yearbook, 1939*:

“Physician and nutritionist alike lack the necessary measuring sticks to evaluate the vague symptoms of ill health resulting from malnutrition. Attempts are being made to measure nutritional status in cases where there are no marked symptoms of deficiency, but such attempts are sorely handicapped by inadequate knowledge both of how to make the measurements and of how to interpret such measurements as are made. With present day knowledge it is possible to measure only a very few of the nutritional disorders that result from a mild deficiency of one or more of the essential food factors. Knowledge of the human requirements for certain of the well-known vitamins and less common minerals is completely lacking. This lack of scientific methods and information ob-

structs progress in promoting *positive and abundant health*. So long as mild deficiencies resulting from slightly faulty diets are not detectable, the means of alleviating such conditions through a fully adequate diet will continue to be neglected and what might be called negative health will become progressively worse." (34) (italics mine)

In the light of the knowledge that a number of the nutritional elements in milk are destroyed in whole or in part by pasteurization, and because of the impossibility, with the knowledge presently available, of determining the long-run effects of the deficiencies caused thereby, it would seem perfectly clear that the U. S. Public Health Service is careless, if not capricious, in claiming that losses suffered through pasteurization can be dismissed as having "no significant effect." It may be reasonably argued that in adopting such an arbitrary attitude, the Public Health Service, through its pasteurization propaganda, may well be obstructing "progress in promoting positive and abundant health."

For example, the Service smugly dismisses the loss of even vitamin C in milk as of no account, because "modern" children will get their vitamin C in fruit juices. Such an assumption is specious for the reason that it presupposes too much. Parents who provide each of their children with a quart of milk, may or may not be able to afford to pay for additional fruit juices. Fruit may be difficult or even impossible to obtain; the need for such a

supplement may not be recognized, or, if it is recognized, the extra effort and/or expense may not be regarded as justified.

This seemingly innocent remark about "modern" children is of great significance. The belittling of the importance of the natural vitamin or other nutrient, obtained in the natural way in the proportion provided by nature, is the key to the whole false philosophy of nutrition which is being currently promoted by the food processing and synthetic vitamin interests, and which might be called the *synthetic* or *compensatory* school of nutrition. The success of these commercial interests depends on maintaining this unsound position, and it is therefore profoundly disturbing to find the efforts of the U. S. Public Health Service to promote this artificial, compensatory type of nutrition, so closely paralleling the efforts of the commercial milk interests, at the cost of the public health and welfare.

The dangers inherent in this commercialized nutrition are expressed or implied in the following statements made at the National Nutrition Conference in May, 1941:

"It is the opinion of this section that all essential nutrients can and should be provided through natural foods." (35)

"Vitamins and other nutrients should be obtained from natural foods rather than from manufactured concentrates." (36)

Comparing the food of the past with that of the present day:

"The foods used were natural, whole foods, furnishing the essentials for human nutrition. Today the situation in a modern industrial country is entirely different. Comparatively few people produce their own food. Production and distribution are commercialized. There is a greater variety of foods, transported over greater distances; but many of them are processed and refined so that they have lost the elements they contained in their natural state. (37)

". . . as food production has become more specialized and commercialized, economic factors have come to complicate food choice and in many cases limit the family food supply in ways that were not formerly true. Furthermore, economic competition in production and processing has a greater effect on food composition than the soil has. (38)

"Nature puts into the foods we eat the vital elements necessary for balanced health. Many of them have been depleted through our zeal for over-refining and by modern cooking methods." (39)

To anyone who believes that the last word on milk has been said, and that it would be possible to state with any degree of certainty that the losses incurred through the pasteurization of milk have "no significant effect," a recent paper "New Developments in Nutrition Research" is recommended for careful reading. (40) The author states:

"The animal body requires about 50 different specific compounds. . . . Milk contains almost all of these 50 nutrients needed by the animals—and you and I belong to this category, I hope you realize."

Then follows an account of a few of the latest findings concerning the presence of several of the nutrients which are found in milk, and their functions. *Vitamin E*, for example,

which had formerly been thought to be concerned solely with the function of reproduction, has now been discovered to be essential for the maintenance of the heart muscle; also, it has been found that vitamin E must be present in the intestinal tract along with *vitamin A* and *carotene*, if the benefit of vitamin A is to be derived. The function of *vitamin B₂* (riboflavin) has been discovered only recently to be involved in the formation of the red blood cells; and, together with the special milk protein, casein, vitamin B₂ prevented liver cancer in 96 per cent of animals tested. *Vitamin B_c* (folic acid) is a new primadonna among the vitamins, because "we feel that there is something about folic acid which can make the animal body a very poor host for cancer development." (40)

The fact that certain of these nutritive properties of milk are known to be either wholly or partially destroyed by pasteurization brings us to the interesting problem of the effects which such losses may have upon human beings. Worthwhile *human* experiments to determine the relative nutritional values of raw and pasteurized milk have been lacking, because of the unequal factors of heredity and environment which would affect and limit adequate control of such experiments, as well as because of the restricting element of time. One exception is noted in the case of calcium and phosphorus retention, which is measurable; and human experiments have shown that there is a decrease in the availability of calcium and phosphorus as a result of pasteurization.

(41) (42)

The importance of any loss of calcium can be noted by reading what the 1939 *Agriculture Yearbook* has to say:

"Calcium is rather abundant in nature, yet there is a calcium problem in nutrition because so many people no longer eat natural foods and because so many natural compounds of calcium are comparatively insoluble and therefore difficult for the body to use. One of the most common deficiencies in American diets, in fact, is a deficiency of calcium." (43)

The importance of calcium in building bones and teeth has long been recognized and the Director of Dental Studies at the London Hospital found that children who drank raw milk before the eruption of the first permanent molars and were continued on raw milk, were free from dental caries. (44) Another confirmatory finding of the superior nutritive value of raw over pasteurized milk is the study made of raw and pasteurized milk as it affected the height and growth of Scottish school children. It was found that the height and weight increase of the children having raw milk was greater. (45)

The damage to human beings, which may be caused by partial loss of calcium, phosphorus and other milk nutrients because of pasteurization, is not readily observed, but, like soil erosion, the progress in deterioration will be relentless, inevitable and devastating. For confirmation of this statement it is important to examine the evidence available through animal experiments. In one of the discussions at the National Nutrition Conference, Dr. E. V. McCollum of Johns Hopkins University presiding, it was stated:

"It is clearly recognized that, with few exceptions the fundamental knowledge which we possess concerning the number and nature of the chemical substances which constitute the essential nutrients, their distribution in our ordinary foods, and the pathological effects of their underprovision, was derived from animal experiments." (46)

Again, from the 1939 *Agriculture Yearbook* we learn:

"Experiments with rats have added enormously to our knowledge of what foods contain and what the various nutrients in foods do to the body. These experiments have pointed the way to the prevention and cure of many deficiency diseases and to a better understanding of the relation of food to health.

". . . the rat is typical of many animals, and its nutritional requirements have proved to be like those of human beings in so many ways that it is extremely useful. As the early physiologists discovered in many decades of difficult study, the fundamental bodily structure and functions of all mammals are very much the same." (47)

". . . the rat lives very fast. Its span of life is two or three years, so that one year is equivalent to 20 or 30 years in the life of a human being." (47)

The talk given at the same National Nutrition Conference by Henry C. Sherman, Columbia University Professor of Nutrition, contained these remarks:

"The rat has been largely used in full-life experiments. The only known important difference between human and rat nutrition is that we are much more responsive to the

ascorbic [vitamin C] and nicotinic acid values of the food than the rat. Thus there is definite evidence (amply convincing if one has the time to study it thoroughly) that the nutritional improvements shown in experiments with rats are well within the scientific probabilities of the benefits which nutrition can bring to human beings." (48)

Since vitamin C is not as much a requirement of the rat as it is of man, it follows that whatever ill effects from pasteurization are demonstrated in rat experiments, can be attributed to deficiencies *other than* the loss of vitamin C.

Concerning experiments made in England to determine the relative nutritional value of raw and heated milk, the following is quoted from the authors' report:

"Our results show definitely that some dietetic factors are destroyed when milk is sterilised, and to a definite but lesser degree when it is pasteurized, and that, although with the method evolved fresh milk is capable of supporting sustained growth and reproduction in rats, heated milk is no longer capable of doing so." (49)

Five years later, the same authors, continuing their work on rats, reported:

"Attention is drawn to a loss of hair shown by some rats of the second and third generations receiving pasteurized milk, which did not occur in corresponding groups of raw-milk fed rats. . . .

"Two does which had received sterilised milk for about eight months showed remarkable improvement after receiving raw milk for about eleven weeks and one gave birth to a litter (dead when found—

probably stillborn) when mated to a buck from the raw-milk groups. ". . . previous to this, 15 matings had been attempted with does and bucks both reared on sterilised milk, and no signs of pregnancy were shown on any one of these occasions." (50)

According to the authors of another experiment on rats at Oregon State College:

" . . . in all experiments, the growth of the rats fed mineralized raw milk or supplemented mineralized raw milk was superior to that of similar experimental groups fed mineralized pasteurized milk or supplemented mineralized pasteurized milk." (51)

Having observed the superior growth of the animals which had raw milk rations over those grown on pasteurized milk rations, the same authors performed autopsies and examined particularly the heart, adrenal gland, muscles and liver. The results of the autopsies showed that the raw-milk-fed animals had no abnormalities, whereas in many cases it was "noted that the nuclei of heart cells from pasteurized-milk-fed animals were shrunken." (51) Various other degenerative changes were found in the gland, muscles and liver, which indicated the superior nutritive value of mineralized raw milk over mineralized pasteurized milk.

With some changes in the diet tried on the rats, the same workers experimented on guinea pigs, to learn the comparative values of raw whole and raw skim milk with pasteurized whole and pasteurized skim milk. This is what they found:

"Animals fed raw whole milk grew excellently and at autopsy showed no abnormality of any kind. Those

on the pasteurized milk rations did not grow as well and developed a definite syndrome [a number of symptoms occurring together], the first sign of which was wrist stiffness. On pasteurized skim milk ration the syndrome increased in severity until the animals finally died in periods ranging from a month to a year or more. They showed great emaciation and weakness before death but remained in normal posture and had little tendency to paralysis of the limbs. Upon autopsy the muscles were found to be extremely atrophied and in most cases were streaked with closely packed, fine white lines of calcification running parallel to the muscle fibres." (31)

Speaking of his animal experiments a professor of Ohio State University had this to say:

"We have studied heat labile [affected by heat] substance in meat and in raw and pasteurized milk. The animals used in our own experiments have been largely cats. The summary of our studies of milk is as follows:

1. The colloidal structure of milk is altered by pasteurization (which is heat). Certain vitamins, enzymes and hormones, some of which are not yet identified, are badly injured.

2. The effect of pasteurized milk as a partial ration is (a) incomplete mineralization of the offspring. (b) The inability of the animal to remineralize its own skeleton adequately after pregnancy and likely to produce a rachitic condition in the offspring. (c) Failure in the development of teeth. (d) Muscular and ligamentous atony. (e) Tendency toward colonic dilation and gas-

tric atony as well as changes in the histological factor of various organs. (f) Tendency toward development in allergies. (g) Tendency toward sterility in subsequent generations." (52)

As to the comparative effects of raw and heat-treated milk as found in his experiments with cats, Dr. Francis M. Pottenger, Jr., well-known California physician and scientist, reports:

"What vital elements were destroyed in the heat processing of the foods fed the cats? The precise factors are not known. Ordinary cooking precipitates proteins, rendering them less easily digested. Probably certain albuminoids and globulins are physiologically destroyed. All tissue enzymes are heat labile and would be materially reduced or destroyed. Vitamin C and some members of the B complex are injured by the process of cooking. Wulzen and Van Wagtendonk have described a thermolabile substance in milk that may be one of the factors. Minerals are rendered less soluble by altering their physico-chemical state. It is possible that the alteration of the physico-chemical state of the foods may be all that is necessary to render them imperfect foods for the maintenance of health. It is our impression that the denaturing of proteins by heat is one factor responsible.

"The principles of growth and development are easily altered by heat and oxidation, which kill living cells at every stage of the life process, from the soil through the plant, and through the animal. Change is not only shown in the immediate generation but as a germ plasm injury

which manifests itself in subsequent generations of plants and animals." (28)

All the reports and findings that have been cited here are the result of careful, scientific work by recognized authorities in their special fields. Their quoted statements are moderate, reasoned and objective. The experiments have been carried on in different places and by different persons over a period of years, and all of them are in harmony. Each one demonstrates the nutritional superiority of raw milk over pasteurized, and when they are considered together, the evidence is overwhelming in favor of raw milk.

In view of the close similarity of bodily structure and functions between man and other mammals, it behooves everyone to become fully acquainted with the tragic results in these rat, cat and guinea pig experiments. With the deteriorating effects of pasteurized milk on these animals now positively established, by reason of their short life span, are we not driven to the compelling conclusion that the only alternative for us humans is a planned program to foster "positive and abundant health" by natural foods, as distinguished from the *compensatory* type of nutrition to which we are all being exposed, attractively yet ruthlessly, by the pressure of the Big Business-Science alliance?

(To be Continued)

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