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Agricultural Experiment Station

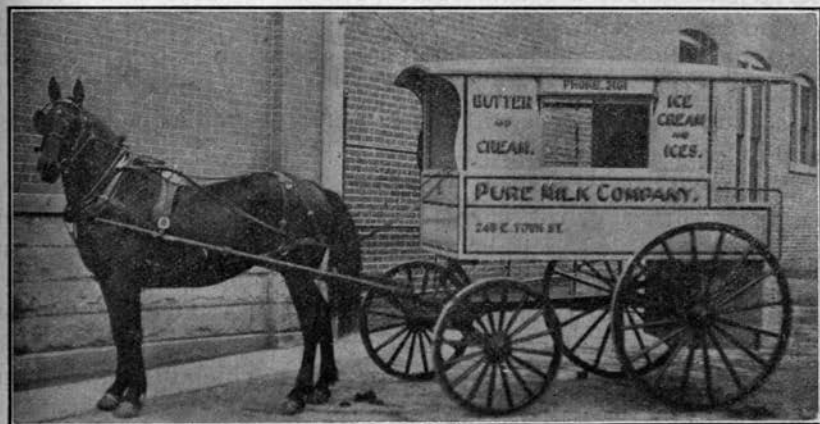
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CIRCULAR NO. 147.

CLEAN MILK

ESSENTIAL REQUIREMENTS FROM PRODUCTION TO CONSUMPTION

BY C. H. YATES AND R. E. BRAND



SERVICEABLE AND CONVENIENT WAGON FOR CITY MILK DELIVERY.

SOME OF THE IMPORTANT REQUIREMENTS FOR THE PROPER CARE AND HANDLING OF MILK

The essential requirements for the production of sanitary milk may be summed up in the two words, *cleanliness and cold*. This means nothing more than that the milk shall be kept clean and cold from the time it is taken from the cow until it is consumed.

CLEAN MILK

Dirt in milk means trouble and expense to the producer, distributor and consumer: trouble, because criticized by dealers, consumers and health boards; expense, because dirty milk sours more quickly than clean milk and may be refused by the dealer or consumer and because it is inferior to clean milk for pasteurization, butter or cheese production, and will bring a lower price. Unless, therefore, milk is fairly clean and quickly cooled, no increased price can be demanded for it, no matter what its cost of production.

CLEANLINESS

Milk, as secreted by healthy cows, is clean. If it could be drawn and handled in that condition, it would keep without material change for a considerable period. If there is dirt on the cow or the milker, or on the pail or utensils, some of it will get into the milk and much of it will stay there, no matter how much straining the milk may have. Why? Because much of the dirt goes into solution and will pass thru any strainer just as easily and quickly as will water.

A very good practical strainer consists of a cone-shaped receptacle with a gauze or cotton strainer at the bottom or outlet of the vessel. It should be of a size most convenient for use, but should hold at least two gallons. The straining cloth, or strainer, is made up of four thicknesses of sterile gauze and one thickness of sterile absorbent cotton. The cotton is placed between the layers of gauze and held in place by a ring which fits tightly over the edges of the gauze and cotton. No. 4 mesh gauze should be used. It comes in 100-yard rolls and can be purchased direct from

the mills which make it, or from a drug supply house, at about 5½ cents a yard. Sterilized absorbent cotton may be had in one-pound or ten-pound rolls and may be purchased of any drug supply house at a cost of about 25 cents a pound. Only enough gauze and cotton to cover an eight-inch space is required for 100 gallons of milk. The cotton should be burned as soon as used, so as to destroy any germs or dirt it may contain. A metal strainer must never be used, and a strainer pail should be avoided; but if such a pail must be used, the strainer should be cut out and all the rough edges and corners smoothed with solder before using it for milk.

About nine-tenths of the dirt in milk has been found to be cow manure. The remaining one-tenth consists principally of cow's hair, milker's hair, dirt from the cow, dirt from the milker, dirt from the barn, particles of hay and straw and germs from diseased cows. Thus dirty milk contains material unfit for human consumption.

CLEANLINESS A REAL ECONOMY

What is meant by cleanliness? Cleanliness for ordinary market milk means giving the cow and milker at least the same attention as we would give ourselves before sitting down to the dinner table. For certified milk, cleanliness means the same attention and care to cows and milkers every day, as one would give to himself on Sunday before attending church.

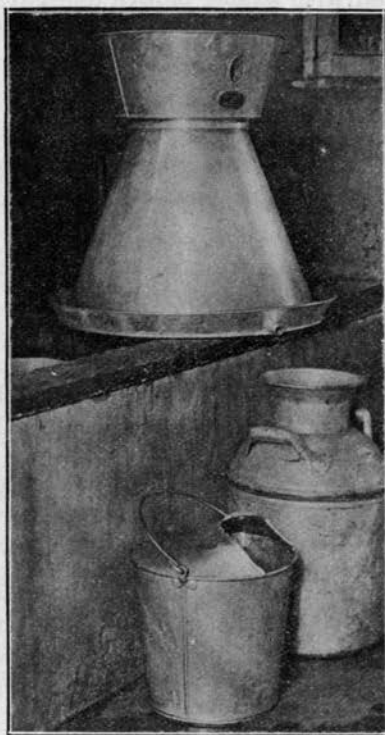
Many dairymen seem to think that all milk of about the same butter fat content is rated alike by the city distributor. Such is not the case except with milk of the same standards of cleanliness, which means, so far as the distributor is concerned, of equal keeping qualities. Milk not properly drawn and cared for is, from the market standpoint, like fruit or any other perishable farm product not properly produced and cared for, and is rated accordingly. It would be just as fair to expect top market prices for sunburnt, weedy hay or wilted vegetables, as for milk that is dirty and not properly cooled. Cleanliness is therefore a real economy, as it eventually commands a better price for the product. This is especially true if the milk is sold directly to the consumer.

COOLING

Proper cooling is reducing the temperature of the milk to 45° Fahrenheit within twenty minutes after it is drawn from the cow and keeping it at that temperature until delivered at its destination.

HOW TO COOL MILK

Milk quickly cooled to 45° F. keeps longer and in better condition, even if dirty, than milk cooled to a higher temperature.



ONE FORM OF COOLER AND A CEMENT TANK FOR HOLDING CANS OF MILK.

Milk in small quantities cools more quickly than milk in large quantities, and in a thin vessel more quickly than in a thick one. Milk passed over a cool surface in a thin stream cools more quickly than in any other way, as by this method milk can be cooled from 90° to 45° F. in thirty seconds. Any other method requires from one to twelve hours for the same result.

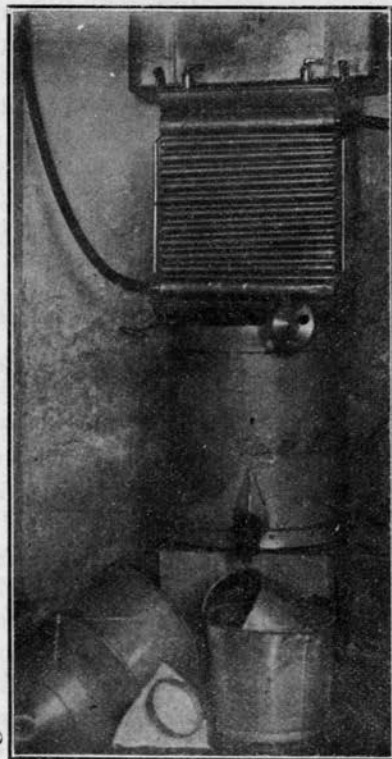
A good dairy thermometer can be purchased for twenty-five cents from any drug store or by mail from any dairy supply house, and should be kept where the milk is cooled, as any dairy farmer should be able to answer such questions as: How do you cool your milk? To what temperature? How long does it take to get the milk to this temperature?

Will it pay to do this? Yes, because it will insure a better keeping milk, a more even product, and therefore a better selling product. If a dairyman wishes to get a better price for milk, this is the quickest, easiest and least expensive way to get it. From twelve to twenty cents per 100 pounds above the market

price is now being paid by many distributors for milk properly cooled with ice and kept cold until delivered at its destination. Five cents' worth of ice for each 100 pounds of milk will be ample for cooling purposes during the months of warm weather, which, for this purpose, should be considered as lasting from April 1 to October 1. However, for best and most economical results, some form of cooling apparatus should be provided. Such a cooler may be had for from \$10.00 to \$25.00 from any reliable creamery supply house. The capacities range from about fifty gallons per hour, upward. Of the many kinds of coolers on the market, we give illustrations of two which seem to meet the essential requirements, viz., simplicity, quick cooling and ease of cleaning.

A CLEAN HERD A HEALTHY HERD

Healthy cows are one of the essentials of a clean herd, as unhealthy cows are a potent factor in the production of impure milk. Healthy cows mean cows free from any disease, especially tuberculosis, and cows that have never aborted or had garget (Mammitis) or any other form of udder disease. To insure healthy cows have the herd tested for tuberculosis by a competent veterinarian and examined by him as to their general health, at least twice a year; separate the doubtful and reacting cows from the rest of the herd, putting them in a separate barn if possible; dispose of them as soon as convenient, and replace them with cows guaranteed as to health and production.



ANOTHER COOLER, STIRRER, WEIGH
CAN, HOODED MILK PAIL, AND
STRAINER WITH STRAINER
CLOTH AND RING AT
ITS SIDE.

HOW TO KEEP THE HERD HEALTHY

With a healthy herd of good producers, it is of great importance to keep them healthy. The best way to do this is to keep them clean by currying and brushing and when necessary, washing tails and flanks; by clipping long hairs from udder, flanks, tail and belly; by housing them in well-lighted, well-ventilated barns, with clean bedding, preferably shavings; by feeding wholesome food in a balanced ration; by keeping a supply of clean water conveniently located so that it can be had as wanted; by having regular milking hours; and by a regular inspection of the herd by a competent veterinarian at least twice a year. This inspection can be contracted for at so much a year to treat all diseases that may occur in the herd. Where this arrangement has been tried it has generally resulted in the veterinarian using every effort to keep disease out of the herd, as prevention is much easier than cure. Such methods tend not only to keep the herd healthy, but also to encourage the milk flow in quantity and persistency.

ECONOMY OF HEALTHY COWS

Tuberculosis is one of the most common, and from the standpoint of sanitary milk production, one of the worst diseases of dairy cattle. Its elimination can only result from the hearty cooperation of all owners of cattle with such regulations as may be recommended by those whose knowledge and experience best qualify them as authorities on this subject. Such authorities recommend the tuberculin test as the best method of detecting this disease, especially in its early stages, and have agreed that this test properly applied, gives correct results ninety seven times out of one hundred. As cows with this disease often show no outward signs of it that a competent veterinarian can discover and since one tuberculous cow may infect a whole herd, it is important that the cattle be tested and those found with the disease be put in a separate building with separate pastures and attendants provided for them. If the same help must take care of all the cows, the tuberculous cows should be taken care of last and a change of clothes provided, so as not to carry infection to the healthy cows. It is best, safest, and in the end, cheapest, to dispose of unhealthy cows as soon as possible. No dairyman can

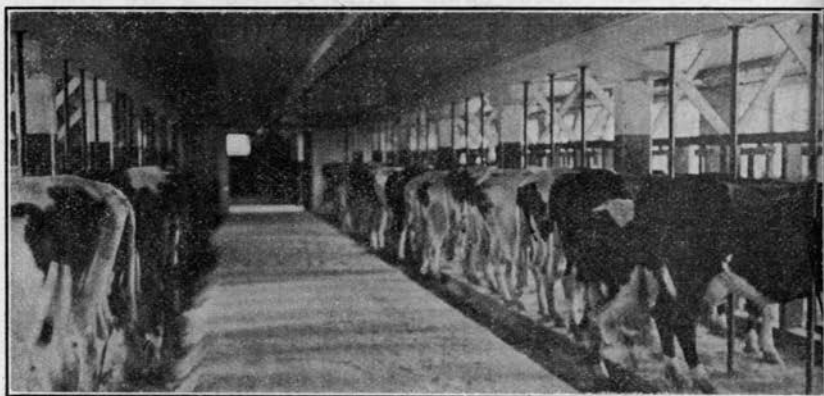
afford to keep tuberculous cows. First, because a cow with tuberculosis tends downward instead of upward, as a rule, in vitality and production. Second, because, as the disease is contagious, a whole herd may be infected by one diseased cow. The tuberculin test would have eliminated the diseased cow and would have thus removed the source of contagion, at a cost not to exceed the value of this one cow. Tuberculin-tested cows are valued higher today in all markets than untested cows. Some cities and towns prohibit the sale of milk from non-tested cows.

Some dealers and breeders in the East are today selling cows on the following terms: They take the order in the spring for what will be needed in the fall, and in the fall for what will probably be needed in the spring. A price is agreed on for a cow giving 30 pounds of milk a day (when fresh) for 20 consecutive days, with the understanding that for every 5 pounds a day over 30 pounds, an increased price will be paid, and for every 5 pounds less than 30 pounds, a decreased price will be paid, provided the animal is accepted. At the end of 60 days these cows are retested with tuberculin, and any cows reacting or not complying with the guarantee are returned to the seller at his expense. It is economy to purchase in this way, even if one has to pay ten or twenty dollars more per cow than he would in an open market. Where there is a demand for this class of cows, a supply can be had.

Since the above conditions are true, facts point strongly to the conclusion that it pays to eliminate tuberculous cows from the herd, and since we obtain more milk from a given number of healthy cows in a given time, and more profits as well, a clean herd is a real economy.

CONSTRUCTION OF THE COW BARN

The cow barn should be designed and located with special reference to natural drainage, good light, ventilation and ease and convenience of the work. Light and fresh air are essentials and should be admitted in abundance. An air space of 500 cu. ft. per cow is sufficient. Provide ventilation, not drafts of air directly over the animals, but air admitted and ejected in such a manner as to exchange the foul air for pure air without discomfort or danger to any occupants of the building. Hard, smooth ma-



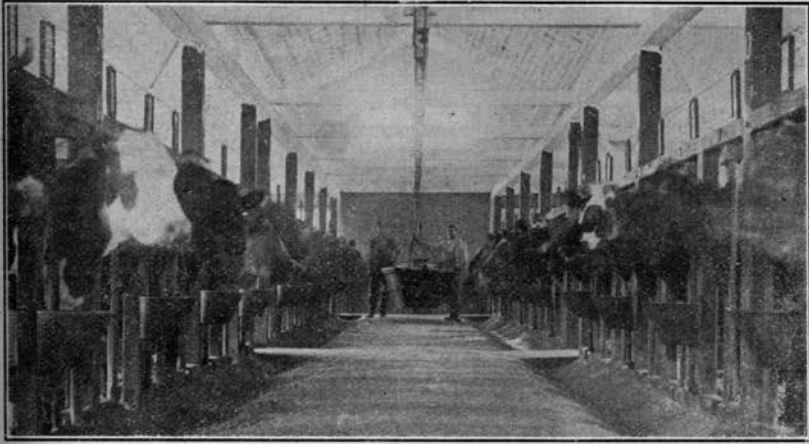
WELL-LIGHTED STABLE, AND PROPER MANURE GUTTER.

terial which does not absorb liquids and has no cracks is the best for stable floors. Stalls should have some sanitary division, preferably of iron piping, between the cows. The stalls should not be too long or too short, but adapted to the cows kept, and should have gutters in the rear that are open and shallow, with incline enough to carry off the water used in cleaning them. These gutters should extend outside the building, and discharge there into a gutter or pipe leading by a sharp incline into a cesspool or container not less than twenty feet distant—the outlet of the cesspool discharging into a covered drain with sufficient fall to carry it in some convenient point at least 1000 feet distant. The outlet of the barn gutter should be an open outlet, and not connected with the discharging pipe or gutter to the cesspool. Otherwise, odors from the cesspool may come into the barn from this source, and if the gutter should become clogged or stopped up, it would be more difficult to remove the obstruction.

Mangers are not necessary and may become infected from the discharges of a diseased animal. Since mangers are hard to clean and disinfect thoroly, disease may be contracted by other animals using the manger.

Feeding from open depressions in the floor in front of the stanchion or head fastening, has been found to be an excellent substitute for the manger. When properly constructed, this depression is both convenient and sanitary. It should be water-

tight and extend without division of any kind the entire length of the row of stanchions. If built with rounded corners and with sufficient incline toward a convenient outlet where the water may

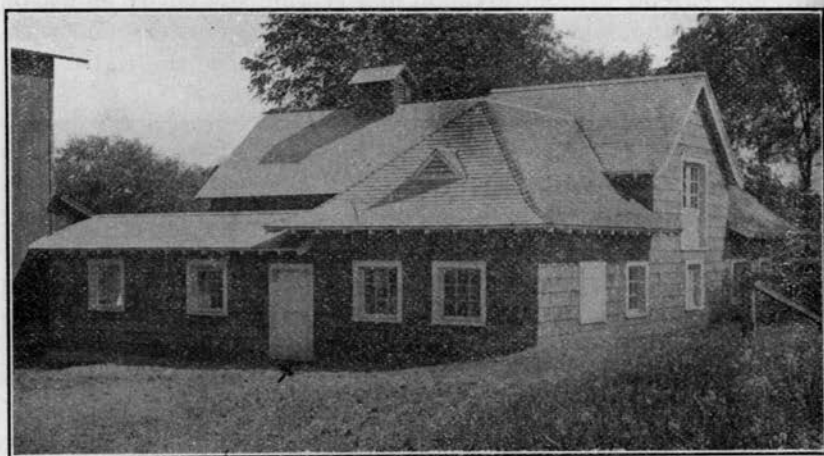


PROPER FEEDING FLOOR, CONVENIENT WATERING DEVICE, TROLLEY, AND CAR FOR DISTRIBUTING GRAIN AND SILAGE.

be drawn off, it may be easily and quickly cleaned and if necessary disinfected. A hose and stiff broom after the morning feeding will make the feeding floor sweet and clean for the next feeding. Once a week soap and hot water should be applied with a brush to these floors, followed by a thoro flushing with cold water, to insure the removal of any grain or undesirable taints that may have adhered to the floor or the adjacent surfaces.

THE MILK ROOM

The milk room should be conveniently located, but not adjacent to any source of contamination. It should be so separated from the cow barn that it will be necessary to leave the cow barn before entering the milk room. Milkers should not carry the milk to the milk room, but should pour it into a strainer which discharges into the milk room. A jointed pipe which can be easily removed and taken apart for cleaning daily is best for the discharge of the strainer. This pipe should carry the milk into a cooler which will reduce the temperature to 45° F. Thus the milk will be protected and quickly removed from the dust and odors of the



MILK HOUSE ON AN EASTERN DAIRY FARM. SHIPPING DOOR AT "X".
COVERED PASSAGE ON LEFT. MILK HOUSE ON RIGHT.

stable, and cooled within a few minutes after it leaves the cow, to a temperature that will check the growth of any germs it may contain. The milk room should contain a vat, preferably of galvanized iron or cement, containing ice and water, into which the cans of cooled milk should be placed and kept until wanted for transportation, bottling or separating, as the case may be. It should have an outlet so that the water may be easily removed and the tank kept free from odors, or if preferred, a cold storage room may be provided for this purpose, adjacent and convenient to the milk room.

BOTTLING

If the milk is to be bottled, it should be done as it comes from the cooler, and the bottled milk at once placed, not submerged, in ice water or in the cold storage room, so as to maintain the temperature to which it was cooled. This means economy of ice and a better kept product at all times, especially during warm weather. It insures a better and more desirable product to the purchaser or consumer, and is also the easiest and most convenient method of handling milk. If the milk is bottled as it comes from the cooler, the milking should be arranged so as to insure

an even product as it comes to the cooler, otherwise it will be necessary to mix all the milk of the herd in a receptacle before bottling.

CLEANING THE UTENSILS

The utensils and containers should be washed in a room separate from the milk room, so that the odors and heat of the wash room may not affect the air and temperature of the milk room. A properly ventilated, five or ten-foot passageway between the two rooms with swinging doors at either end, will be found convenient and effective. The floors of these rooms should be of water-tight material, preferably cement, and should slope to some convenient outlet leading thru a trap to the general drainage system, or a separate and equally efficient system of disposal. All utensils should be rinsed in clean, warm water and finally boiled, or steamed for twenty minutes in a room or enclosure provided or other clean place to drain and dry until used. If a steam room or sterilizer is used, the utensils may remain there until needed. If the passageway between the milk room and wash room is so arranged as to have an abundance of sunlight, the utensils could be kept there until needed.

MILKERS' SUITS

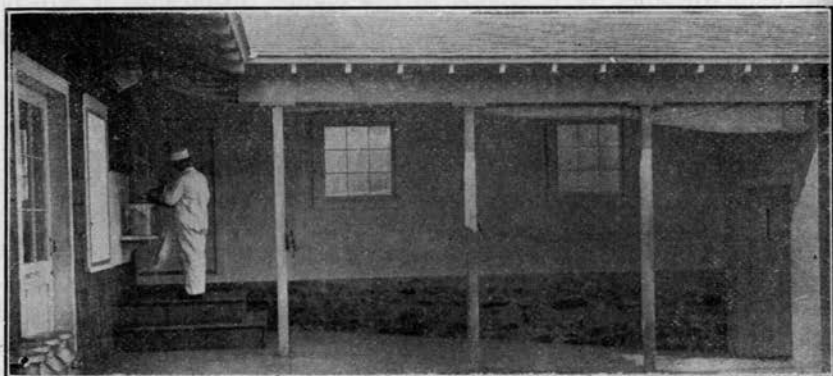
The milkers should have clean hooded pails, clean, dry hands and clean clothes. A suitable and convenient place should be provided for them in which to keep their milking suits and to wash their hands before milking. It should adjoin the wash room, but should be separated by a partition.

TOILET

If a toilet is provided, this should also be separated from the wash room by a passage, with swinging doors at either end to insure freedom from contaminating odors.

WATER

A good supply of water is necessary to a dairy. Water from a considerable depth is best as it is generally pure and cold. To keep the water pure, it is necessary to protect it from contamination. The top of the well should be covered and the ground leading up to it sloped, or graded so that surface water will drain away from the top of the well quickly. Cows and other animals should be



OUTDOOR PASSAGE BETWEEN STABLE AND MILK HOUSE, PAGE 10. MILKER
EMPTYING PAIL INTO STRAINER, WHICH DISCHARGES INTO
COOLING VAT IN MILK ROOM.

kept from standing around the well. This can be done by putting a board or wire fence around it with a swinging or self-closing gate. No filth or manure should be stored or piled within 100 feet of the well. Water from a shallow well (less than 40 feet deep) within 100 feet of any building, should never be used for washing milk utensils. If no other supply is available, have the water analyzed by your local health board, and if it is found to be of doubtful quality, boil it thoroly before using for any purpose.

ECONOMY OF PRODUCTION

The expense of milk production is more often increased by excessive feed cost than by expensive equipment. The dairyman who claims that he cannot afford to give more care to his milk is apt to be one suffering from excessive cost of production, not because of the care given the cows and the milk, but because his cows are not returning him a just profit on the feed consumed. The expense must be regulated by the market demands. Therefore, the investment must not exceed the essential requirements for the production of properly safeguarded milk for the market use. An expensive equipment is not essential for the production of clean milk. Understanding the fundamental points of sanitary production, each dairyman can adapt his local conditions to modern

requirements with but slight additional cost. Whitewashed walls and ceiling, cement floors, abundance of sunlight, and clean methods practiced daily, will make clean milk production in any dairy barn possible. But the better the equipment, the less the labor required to insure cleanliness.

Hoard's Dairyman has gathered statistics showing the manner in which many farmers are feeding their cows. It was found that the feed cost of a pound of butter fat varied from 11 cents to 54 cents, and that the cows do better and feel better when fed a balanced ration than when fed an unbalanced or unpalatable one.

If the feed cost of one pound of butter fat is 54 cents, it is too high and of no special benefit to the cow or her owner. This cost will vary with the locality and with the individual animals but largely with the price and kind of feed. Yet when this cost is beyond that permitting of a reasonable profit to the dairyman, there must be something wrong.

If dairymen would breed up herds of better cows from a strain of persistent milkers free from all diseases; weigh the milk of each cow daily or weekly, so that the production of each cow may be known; use healthy bulls from heavy milking families; raise their heifer calves until the average production is above ten quarts of four percent milk per day per annum and supervise the work regularly and constantly, then the same number of cows would eventually produce more milk at a less cost per quart and the same price from the dealer would then give more net profit than under old conditions. For example:

Cost of production of 300 qts. from 50 cows is.....	\$ 9.00 per day
Price received is $3\frac{1}{2}$ cents per quart. 300 at $3\frac{1}{2}$ cents..	10.50 per day
Profit from 300 quarts,.....	\$ 1.50 per day
Cost of production of 500 qts. from 50 cows is.....	\$12.00 per day
Price received is $3\frac{1}{2}$ cents per quart. 500 at $3\frac{1}{2}$ cents. .	17.50 per day
Profit from 500 quarts,.....	\$ 5.50 per day
* Increased profit from the same number of cows,....	\$ 4.00 per day

If it is the methods of feeding or the character of the cows, the Agricultural Experiment Station may be able to point out the difficulty and help the dairyman make a profit at the prevailing

*These assumptions are based on the latest available data. For detailed information see Illinois Agricultural Experiment Circular No. 134, —Cow Index of Keep and Profit.

prices by economizing at home, which is a much surer way to net returns than waiting for an increased price from your market. Still with proper care the price paid for good milk will rise. One producer cannot always enforce his demands, but a united demand from a majority of producers is inevitable if the cost of production increases so that sound financial reasoning shows sufficient profit impossible. This means proportionately increased price to the consumer.

THE DISTRIBUTOR

The distributor or dealer is in intimate contact with most of the questions relating to economic, sanitary milk production and is between the upper and nether stones of the mill, as it were, as he has to meet the demands of both the producers and consumers and at the same time fulfill the requirements of the national, state and local departments under which he operates. He must take the milk as it comes to him and deliver it in the condition and package demanded by his customers, and since modern requirements necessitate more care and expense to the distributor than formerly, he must grade his prices for purchase and sale so as to insure a reasonable business profit. The dairyman demands an advanced price from the distributor for extra care and expense which he also is obliged by the authorities which control his supply to maintain. The consumer demands this improved product at no increase above former market prices. How to meet this problem successfully and to survive financially is, therefore, the greatest problem of the distributor at the present time.

HOW THE DISTRIBUTOR MEETS HIS PROBLEM

The distributor tries to convince the consumer, thru unprejudiced sources that his claims are valid; that he is entitled to a price commensurate with the cost of the product which the consumer demands and the authorities compel him to supply; that less than that price means a less sanitary product; that decreased cost of production and handling would mean the removal of such safeguards as are considered essential for the proper protection of the consumer and that discourage rather than stimulate the production of unsafe milk which sells readily at a reduced price.

Unsanitary milk should be so labelled as to identify its character clearly, so that those who purchase it may know they are courting danger and in order that the better product will then not be confused with the inferior, but will command a better price. In other words, the distributor must create a demand, at its proper food value, for what he is compelled to supply.

The natural trend of the situation is to eliminate from this struggle all distributors whose capital will not tide them over the period necessary to establish a fair price for what the public may finally demand. With a fair price, the small dealer can exist, otherwise he must withdraw from the field. In the meantime the survivors must establish such economies as market conditions necessitate,—even perhaps to the elimination of some safeguards which now seem essential.

TRANSPORTATION

Another point of importance to both dealer and producer in the handling of the milk supply for large cities is that of transportation. In some cities milk cannot be used if, on arrival, it has a temperature above 50° F. This is a necessary and reasonable requirement but is difficult to maintain unless the transportation companies are required to keep the milk below 50° F. while in their care. To do this the companies should provide proper shelter for milk on their platforms, and refrigeration in transit. They should deliver milk at its destination within a reasonable time. State or national laws should insure this protection to the producer, distributor and consumer by assigning proper penalties for failure to meet these demands.

DUTY OF THE CONSUMER

The consumer should demand standards and insist on their enforcement by the proper authorities. He should know what kind of milk he wants as well as its value and be willing to pay for the value. He should be able to buy milk with the same intelligence of choice he displays in buying any other article of food in common use.

HOW TO GET THIS INFORMATION

At present the score card system is the only guide for the consumer. By this system each dairy farm and each distributor is rated according to his equipment for, and methods of handling milk. Where this system is in force, these ratings are kept on file at the Health Commissioner's office, and may be seen at any time by any citizen. The perfect score, 100, is rarely attained. Above 90 is reached only by those farms producing certified milk, less than one percent of total supply; above 70, by a small proportion of city market milk, about 10 percent; and below 70, by balance of the supply, about 90 percent.

Milk should be labelled and guaranteed under proper penalties as are other liquids today. Its price should be proportional to the quality guaranteed. Each store and delivery wagon should post conspicuously the grade of milk it carries. A consumer could then purchase intelligently and in each instance would get full value for the price paid. This cannot be done until consumers refuse to buy milk unless so guaranteed, for no authority can compel dealers to furnish what the consumers do not want and will not pay for. Other food products are graded according to the standards. Why should not milk, one of the few products which cannot always be judged by its appearance, be so graded? Other things being equal, if milk from dairies, scoring below 70, is entitled to the market retail price, then milk from dairies, scoring below 70, should receive a correspondingly lower price.

In the absence of any other form of guarantee, the opinion of the health board or physician is today the only reliable source of information within convenient reach of the average consumer, except for certified milk. The health board and medical societies of many of our cities have accomplished much for the improvement and safeguarding of the milk supply. It now remains for the consumer to complete this good work by requiring a guarantee of cleanliness on each bottle of milk sold and by seeing that the price shall grade with the guarantee, somewhat as follows:

	Dairy score
1st grade, Certified milk.....	Above 90
2nd grade,	Above 70
3rd grade,.....	Below 70

A SIMPLE TEST FOR UNCLEAN MILK

When a bottle of milk is received, place it where it will be undisturbed for one hour; then without disturbing the contents, lift the bottle until the entire bottom of the bottle can be examined for sediment.

As has been previously stated, 90 percent of the sediment found in the milk is cow manure, and 10 percent a collection of equally undesirable and dangerous matter. Clean milk has no sediment. Which is the consumer willing to pay for? If he demands and will pay a fair price for clean milk, then unclean milk can be sold only at a reduced price, thus establishing its identity.

THE CONSUMER'S RESPONSIBILITY

Even if it is clean and cold when received, milk will spoil if carelessly handled by the consumer. It should be on ice as soon as received and kept there until used. If a part of the contents are used, destroy the paper cap and invert a clean china cup over the top of the bottle before returning it to the ice chest. Milk absorbs odors and dust quickly. It should therefore not be exposed to them, either in the kitchen or refrigerator. Consumers should refuse to purchase or use milk which shows sediment. It is a sure indication of unclean methods and is a probable source of danger.

Standards must be established in each locality. A proper milk ordinance which contains requirements forbidding any dairyman or dealer to sell milk for any purpose without a permit must be insisted upon. The issuance of a permit must be dependent upon compliance with requirements necessary for public safety. These requirements then will be reasonably fulfilled if the ordinance forbids any milk to be sold from a dairy scoring lower than 60 by the U. S. score card system, or by any distributor whose city milk plant or store scores below 70 by the same system; if it compels frequent scoring and the dairyman and distributor to post these scores in conspicuous places; if it forbids the collection of empty bottles or cans from a house where there is an infectious disease until such premises have been disinfected and released from quarantine by the Board of Health; if it forbids the

handling of milk by anyone who has any infectious disease or has been exposed to such a disease; if it forbids the location of a dairy or dairy store near any source of contamination, and if it provides proper penalties for all violations of these requirements.

The milk laws of today incur at the first some hardship and some extra expense to the dairyman, but eventually gain, because of improved conditions, better business arrangements and a better mutual understanding between producers, distributors and consumers.

Present laws mean:—

1. Cleaner and safer milk. Cleaner milk means more attention given to daily details of producing and handling the milk, thus insuring safer milk because there is less danger from contamination and infection on account of unsanitary methods.

2. Increased cost of production and handling under required methods. This increase means extra labor, repairs and improvements for sanitary requirements, not a large cash outlay, but more careful supervision. A little cement and whitewash, properly used, will in a short time without great expense vastly improve the character of the worst cow building. The extra labor will pay for itself several times over in increased net returns.

3. An increased price to consumers, as the extra cost involved in producing the product demanded necessitates a correspondingly increased cost to the consumer.

It would be well if women, the domestic rulers of the nation, would take a prominent part in spreading the fundamental principles of this great question. Schools of Household Science and women's organizations that consider the betterment of human conditions, should in connection with other questions of food and sanitation, give some time to the consideration of our milk supplies.

SUGGESTIVE FORMS AND FORMULAS*

Following is an example of a city ordinance which covers many of the important points, essential to a clean milk supply. The score cards, application blanks, license and permit forms given are the means of keeping in touch with the milk supply of the community. Thru the proper filing of such records one at any

*Modeled largely after those used in eastern states.

time could find out the conditions under which his milk was produced. The health officers would have a check on the various deliveries and could much more readily locate a disease due to improperly handled milk. Local conditions may require many changes or modifications, but these forms will serve as a guide to those unfamiliar with the existing regulations in many of our cities and towns.

MILK STATUTES

CONCERNING THE ADULTERATION, INSPECTION AND SALE OF MILK

SECTION 1. Any milk which is sold or exchanged shall be deemed to be sold or exchanged as a standard quality unless otherwise expressly stated at the time. Milk of standard quality shall contain not more than eighty-eight and one-quarter per cent of watery fluid, not less than eleven and three-quarters per cent of milk solids, not fat, and not less than three and one-quarter per cent of milk fats; and the certificate of the Director of the State Agricultural Experiment Station shall be *prima facie* proof of the composition of any milk.

SECTION 2. No person shall sell or exchange any milk which is adulterated or not of standard quality, or which has been wholly or in part skimmed, or shall supply milk that is tainted or partly sour to any customer buying the same for sweet milk.

SECTION 3. No person shall sell milk from which the cream or any part thereof has been removed, without distinctly and durably affixing a label of metal in a conspicuous place upon the outside and not more than six inches from the top of every can, vessel or package containing such milk; and such metal label shall have the words, "Skimmed Milk", printed thereon in letters of not less than one inch in height, and such milk shall be sold only at retail out of a can, vessel or package so marked.

SECTION 4. Every person who shall violate any provision of section two or three shall be fined not more than—dollars for each offense.

SECTION 5. All sales of milk or cream shall be made by wine measure.

SECTION 6. No person, firm or corporation having custody of any container for milk intended for sale shall place, or permit to be placed therein any article other than milk, skimmed milk, buttermilk, cream or water, or other agent used for cleansing of said container.

SECTION 7. No person, firm or corporation shall send or permit to be delivered to any producer of milk, any container for milk, containing any offensive material.

SECTION 8. Every person who shall violate any provision of section five, six or seven shall be fined—dollars for each offense.

SECTION 9. The dairy commissioner shall have power to enforce the provisions of the preceding sections of this act and, when the necessary evidence is submitted by the proper authority that any of the said provisions have been violated, he shall make complaint to the proper prosecuting officer.

SECTION 10. The warden and burgesses of a borough or the mayor with the approval of the common council of a city may appoint a competent person as milk inspector who may personally, or by some competent person appointed by him, inspect all milk or cream sold in such borough or city, may inspect all animals producing such milk, the buildings and places where such animals are kept, the dairy and other places where such milk or cream is kept, handled, produced or sold, whether the same be within the limits of such borough or city or not; and said burgesses or common council may prohibit the sale of such milk or cream, within the limits of such borough or city, except by such persons as shall register their names, residences and numbers in a book kept for the purpose at the office of the clerk of such borough or city. The clerk shall receive for each name so registered, fifteen cents from the treasurer of such borough or city. Such inspector or assistant shall have the right to take samples of milk or cream from any producer or vendor upon the tender of the market price thereof, but he shall, if such producer or vendor so requests, seal and mark a duplicate sample of such milk or cream and leave the same with such producer or vendor. The warden of any borough or the mayor of any city may for cause remove the inspector.

SECTION 11. Every person who shall knowingly sell milk, or any product of milk, from a cow which shall have been adjudged as affected with tuberculosis or other blood disease by the commissioner of domestic animals, shall be fined not more than—dollars, or imprisoned not more than—days, or both.

AN ORDINANCE RELATING TO INSPECTION OF MILK

Investigation of Milk SECTION 1. It shall be the duty of the Board of Health Commissioners of the City of ———, through its members or agents to investigate the quality of milk which may be sold or exchanged within said city and they shall make or cause to be made such examination thereof as may be necessary to ascertain whether or not adulterated or impure milk is sold or exchanged in said city contrary to the statutes of the state, or to the provisions of this ordinance and shall also report all such violations to the prosecuting attorney for the prosecution forthwith.

Power of Entrance to Any Premises and to Stop Teams And Persons SECTION 2. Said Board of Health Commissioners and its agents shall for the purpose of the foregoing section, have the power to enter any building and upon any premises within the said city where milk is sold or exchanged at any reasonable time for the purpose of making examinations as provided in the preceding section, and it shall be lawful for such Board of Health Commissioners and its agents for the purpose of examination to stop and detain any person or vehicle within said city, carrying milk which is to be sold or exchanged or to be delivered on sale.

Inspection of Dairies SECTION 3. Said Board of Health Commissioners and its agents is hereby empowered to inspect all animals producing such milk, the buildings and places where such animals are kept, the dairy and other places where such milk is kept, handled, or sold, whether the same are within the limits of the city of ———, or not.

Licenses Shall be Procured SECTION 4. Every person who conveys milk in vehicles or otherwise in said city of ———, for the purpose of selling the same in said city, or who produces milk within the city limits, shall annually on the first day of April, or within thirty days thereafter, procure a license from the clerk of the Board of Health Commissioners of said city to sell milk within the limits thereof, and shall pay to said clerk for the use of said city the sum of ——— cents for every such license. The said clerk shall pay over quarterly to the treasurer of said city all such sums collected by him.

Requirements For License SECTION 5. The licenses herein provided for shall be issued only in the names of the owners of the vehicles, by means of which the business is carried on, and shall for the purpose of this chapter, be conclusive evidence of ownership, and no license shall be sold, assigned or transferred. Every license shall bear a special number and state the name, residence and place of business of the licensee, whether or not the milk sold by him is of his own production, and if not, the name of such other producer and where any and all milk sold by him is produced. Every such license shall also state the number of wagons or other vehicles used by such licensee in his milk business, and the name and residence of every driver engaged in carrying, selling or delivering milk for him.

Signs Upon Vehicles SECTION 6. Each licensee shall, before engaging in the sale of milk as aforesaid, cause his name, the number of his license and his place of business to be placed in legible characters, to the satisfaction of the clerk of the Board of Health Commissioners, in such conspicuous place or places as said clerk of the Board of Health Commissioners may designate, on the outer side or sides of all carriages or vehicles used by him in the conveyance and sale of milk.

Report Changes of Employees SECTION 7. Every such licensee shall report to the clerk of the Board of Health Commissioners any change of driver or other person employed by him in the business aforesaid during the term of his license, together with the name and address of every such substitute driver and employee, and of any or all additional employees.

License for Portion of Year SECTION 8. Said clerk of the Board of Health Commissioners may, at any time after the first day of April in any year, issue licenses in form and upon terms herein provided, to continue in force from the date thereof until the first day of April next, to parties who may begin the business aforesaid after the first day of April in the current year.

Record of Licenses SECTION 9. Said clerk of the Board of Health Commissioners shall keep a record of all licenses issued, in a book prepared for that purpose, which shall set forth the matters and things specified in the license.

Penalties for Violation SECTION 10. Any person who shall engage in the business aforesaid without being first licensed as herein provided, or who shall violate any of the provisions of sections seven, eight, nine and ten of this ordinance shall, for the first offense, pay a fine not exceeding —A— dollars, for the second offense, a fine not less than —A— dollars nor more than —B— dollars, and for each subsequent offense, shall pay a fine of not less than —B— dollars nor more than —C— dollars, and may be imprisoned not more than ——— days.

Police to Assist in Enforcement SECTION 11. It shall be the duty of the members of the Police Department to assist the Board of Health Commissioners, its agents, servants and employees, when required, in the performance of the duties of the said Board prescribed by this ordinance, and to report to the clerk of said Board, or other person designed by said Board, to receive such notices, any violation of this ordinance or of the laws of the state in respect to the handling, transportation or sale of milk within the knowledge of said Police Department or any member thereof.

Shops, Stores, etc. SECTION 12. No person shall, in the city of ———, sell milk at a shop, store, booth, stand or market-place until he shall have made written application to the Board of Health Commissioners and shall have furnished to such Board, such particulars as to his business as may be required, on stated forms to be prepared by said Board, for such purpose.

Suspension of License SECTION 13. The President of the Board of Health Commissioners shall have power and is hereby directed to suspend any license issued or to be issued under this ordinance, when in his opinion just cause exists for so doing. For the purpose of carrying out the provisions of the foregoing ordinance, the Board of Health Commissioners passed the following:

ORGANIZATION OF MILK INSPECTION

Appointment and Duties of Milk Inspector 1. A milk inspector shall be appointed, who shall collect samples of milk, only in bottles or receptacles obtained from the laboratory of the Board and deliver the same to the laboratory for examination; said inspector shall see that the rules and regulations governing the milk supply are observed and report any infringements. He or his representatives shall visit all dairies supplying milk to the city of ———, and all places where milk is offered for sale, as often as is deemed necessary by the Board and report the conditions of the same in writing.

Bacteriological Examination 2. All chemical and bacteriological examinations of milk shall be made at the laboratory of the Board and under the supervision of the bacteriologist, for which compensation shall be provided.

Regulations 3. Rules and regulations governing the milk supply of the city of _____.

License No person shall engage in the sale of milk or cream in the city of _____ unless he shall first obtain a license from the Board of Health in accordance with section seven of the City Ordinance.

Vehicles How Marked Everyone using any vehicle for the delivery of milk in the city of _____ shall have designated thereon, in legible Roman letters not less than two (2) inches in height, the owner's name and the number of the wagon for the purpose of identification.

Vehicles to be Kept Free from Anything Unwholesome No person shall carry upon any wagon or vehicle, upon or from which milk or cream is being brought, stored, deposited, sold, delivered or distributed as food for any human being, any refuse or any unwholesome, noxious or filthy matter.

No Impure or Adulterated Milk Sold No person shall sell any impure or adulterated milk.

Everything Clean All milk premises, vehicles, receptacles and persons handling milk shall be kept scrupulously neat and clean.

Stores All stores or other places in which milk is kept for sale shall be kept in good sanitary condition and the milk protected from contamination.

Stables Cow stables shall be well-lighted and ventilated and kept clean.

Diseased Cows No milk from an unhealthy or diseased cow shall be used, kept or offered for sale and no milk shall be sold or distributed in the city of _____, that was drawn from cows, within fifteen days before or five days after parturition.

No Privies, etc., in Proximity to Milk No water-closet, privy, cesspool or urinal shall be located within any room used for the handling or storage of milk or cream, nor in any room opening into the same; nor shall any milk or cream be stored or handled or sold from any room used for sleeping or domestic purposes.

Cooling and Bottling Immediately after milking, the milk shall be removed from the stable into a milk room; the bottling of milk or cream must be done only in a light, clean, well-ventilated room from which dust and insects are excluded by screening.

- No Bottles Filled on Street** Milk and cream bottles shall not be filled at any other place than the dairy room and under no condition shall the vendor fill the bottles on the delivery route.
- Cleansing of Cans and Bottles** All cans or bottles used in the distribution of milk must be thoroly cleansed and sterilized by boiling water or steam before they are again used as receptacles for milk.
- Tickets** If dairymen or other persons offering milk for sale, use tickets as representatives of value, these tickets must be in coupon form and must be destroyed after once using.
- Notifications of Contagious Disease in Family** If any person or persons having any connection with any dairy or with the handling of milk and cream for sale, or any resident member of the family or any person so situated, be stricken with and infectious or contagious disease, any notice thereof must be immediately sent to the Board of Health.

FORMS

APPLICATION FOR PERMIT

I, _____, hereby apply for a permit to produce milk for the city of _____ in accordance with the rules of the Board of Health of said city during the year ending May 31, _____

Location of dairy, _____

Name of owner, _____ Address _____

No. of cows, _____, Ave. production, _____

Retailed in, _____

Wholesale to, _____ Add. _____

APPLICATION FOR LICENSE

I, _____, hereby apply for a license to sell milk in the city of _____ in accordance with the rules and regulations of the Board of Health of said city, during the year ending May 31, _____

Location of dairy, _____

Location of store, _____

No. of wagon, _____ Obtain milk from:

Name, _____ Add. _____

Name, _____ Add. _____

No. _____

CITY OF _____ ILL.

MILK INSPECTION
Public Health Department

**Milk Producer's
Permit**

NAME _____

RESIDENCE _____

Issued _____

Seal

CITY OF ILLINOIS
BUREAU OF MILK INSPECTION
PUBLIC HEALTH DEPARTMENT

1910 **Milk Producer's Permit** 1911

This Certifies That _____

of _____

*has complied with the regulations of the Board of Health of the City of
_____ concerning the production of Milk, and is hereby granted
permission to offer his product for sale in said city, so long as the regulations
of the said board are observed.*

No. _____ Issued _____ 191— _____

Food Inspector

NOT TRANSFERABLE

Post this in a CONSPICUOUS Place.

No.

CITY OF _____ ILL.

MILK INSPECTION
Public Health Department

**License
To Sell Milk**

NAME _____

PLACE OF BUSINESS _____

Issued _____

Seal

CITY OF ILLINOIS
BUREAU OF MILK INSPECTION
PUBLIC HEALTH DEPARTMENT

1910 **License to Sell Milk** 1911

No.

This Certifies That.....
residing at.....*Street, and doing business*
at or from.....*is hereby granted*
license to sell milk in the City of.....*Illinois, so long as the regulations*
of the Board of Health are observed.

.....
Food Inspector

PERMIT NO.

NAME OF PRODUCER

PERMIT NO.

NAME OF PRODUCER

NOT TRANSFERABLE

Post this in a CONSPICUOUS place.

MILK DEPOT SCORE CARD.

EQUIPMENT	SCORE		METHODS	SCORE		MILK SUPPLY:
	Perfect	Allowed		Perfect	Allowed	
Milk and Salesroom LOCATION—Deduct when Connected with Store 1, Living Rooms 2, Kitchen 2, Laundry 4, Barn 4	4		Milk and Salesroom CLEANLINESS—Deduct when Unclean Floor 2, Unclean Walls 2, Unclean Ledges 1, unclean Ceiling 3	8		Name
Construction CONSTRUCTION—Allow for Floor if Cement, smooth, etc. 2; Wood 1, if defective 0; Proper Drainage 1; Walls and Ceiling, smooth and free 2	5		No Unnecessary Articles No odor 2; No dust 1, No Flies 3	2		Name
LIGHT -- Deduct 1 point for every 3 per cent less than 15 per cent floor space	5		Washroom CLEANLINESS—Floor 1, Walls and Ceiling 1	2		Name
VENTILATION —Automatic System 3, Ajust. Windows 1	3		DRAINAGE —Ample 1, Trapped	2		Address
SURROUNDINGS —Kept Clean within 10 feet of doors and windows (no allowance if under same roof as barn)	2		Vats and Refrigerators CLEANLINESS—Deduct for Unclean Interior 1, Odor 2, Dirty Water 2	5		Address
Washroom LOCATION—So that dirty utensils do not have to pass thru milkroom 1, smooth Cement Floor 2, Hot water 2	5		Washing and Cleaning Utensils WASHED with Brushes, Alkali and Water	3		R. R.
Vats and Refrigerators Impervious Construction 2, Well covered or closed 1	3		RINSED in Clean Water Well Drained 1	2		R. R.
Tubs and Washing Facilities Smooth Tubs 1, Revolving Brushes 1, Rinsing Facilities 1, Draining Facilities 1	4		STERILIZED with Live Steam	1		Platform
Utensils CONSTRUCTION—Smooth, free from spaces 3 CONDITION—Free from rust 2	5		Handling and Bottling Milk Not done at time of Washing Bottling Machine, etc., Kept Covered	5		Platform
Bottling and Other Machinery CONSTRUCTION—So that can be cleaned 2, Covered when not in use 1	3		ATTENDANTS—Allow for clean Suits 3, Clean Hands 2	2		Time
Bottle Caps In clean and dust-proof boxes	1		Storage of Milk Promptly Cooled to 50° F. or below Stored below 50° F. At 51° to 55° F. 5, 56° to 60° 3, Over 60° 0	3		Time
TOTAL	40	1	No other Articles in Milk Box	6		Time
			Milk Delivery Product Protected Product Iced	2		Time
				1		Tub. Tested
				3		Tub. Tested
			TOTAL	60		Tub. Tested

Score for Equipment + Score for Methods = FINAL SCORE

Signed: _____

Food Inspector. _____

Dairy Score Card.

DETAILED SCORE.

EQUIPMENT.	SCORE		METHODS	SCORE	
	Perfect	Allowed		Perfect	Allowed
COWS.			COWS		
Health	6		Cleanliness of cows	8	
Apparently in good health... 1			STABLES		
If tested with tuberculin once			Cleanliness of stables	6	
a year and no tuberculosis			Floor	2	
is found, or if tested once in			Walls	1	
six months and all reacting			Ceiling and ledges	1	
animals removed..... 5			Mangers and partitions..... 1		
(If tested only once a year and			Windows	1	
reacting animals found and			Stable air at milking time.....	6	
removed, 2.)..... 2			Barnyard clean and well drained	2	
Comfort	2		Removal of manure daily to		
Bedding	1		field or proper pit..... 2		
Temperature of stable..... 1			(To 50 feet from stable, 1.)....		
Food (clean and wholesome).....	2		MILK ROOM		
Water	2		Cleanliness of milk room.....	3	
Clean and fresh	1		UTENSILS AND MILKING		
Convenient and abundant.... 1			Care and cleanliness of utensils	8	
STABLES.			Thoroughly washed and steril-		
Location of stable	2		ized in live steam for 30 min-		
Well drained..... 1			utes	5	
Free from contaminating sur-			(Thoroughly washed and		
roundings	1		placed over steam jet, 4; thor-		
Construction of stable..... 4			oughly washed and sealed with		
Tight, sound floor and proper			boiling water, 3; thoroughly		
gutter..... 2			washed, not scalded, 2)		
Smooth, tight walls and ceil-			Inverted in pure air..... 3		
ing	1		Cleanliness of milking.....	9	
Proper stall, tie and manger. 1			Clean, dry hands..... 3		
Light: Four sq. ft. of glass per			Udders washed and dried... 6		
cow (Three sq. ft., 3; 2 sq. ft.,	4		(Udders cleaned with moist		
2; 1 sq. ft., 1. Deduct for uneven			cloth, 4; cleaned with dry cloth		
distribution.)			at least 15 minutes before milk-		
Ventilation, Automatic system.	3		ing, 1.)		
(Adjustable windows, 1)			HANDLING THE MILK.		
Cubic feet of space for cow: 500			Cleanliness of attendants.....	1	
to 1000 feet..... 3			Milk removed immediately from		
(Less than 500 feet, 2; less than			stable	2	
400 feet, 1; less than 300 feet, 0;			Prompt cooling. (Cooled imme-		
over 1,000 feet, 0.)			diately after milking each cow)		
UTENSILS			Efficient cooling: below 50° F....	5	
Construction and condition of	1		(51° to 55°, 4; 56° to 60°, 2.)		
utensils			Storage; below 50° F. 3		
Water for cleaning	1		(51° to 55°, 2; 50° to 60°, 1.)		
(Clean, convenient, and abund-			Transportation; iced in summer.		
ant.)			(For jacket or wet blanket al-		
Small-top milking pail..... 3			low 2; dry blanket or covered		
Facilities for hot water or steam	1		wagon, 1.)		
(Should be in milk house, not					
in kitchen.)					
Milk cooler	1				
Clean milking suits	1				
MILK ROOM					
Location of milk room	2				
Free from contaminating sur-					
roundings..... 1					
Convenient..... 1					
Construction of milk room.....	2				
Floor, walls, and ceiling..... 1					
Light, ventilation, screens... 1					
Total	40		tal	60	

**UNITED STATES DEPARTMENT OF AGRICULTURE,
BUREAU OF ANIMAL INDUSTRY,
DAIRY DIVISION.**

SCORE CARD FOR MILK.

Place.....

Class..... Exhibit No.

ITEM	PERFECT SCORE	SCORE Allowed	REMARKS
Bacteria	35	.....	Bacteria found per } cubic centimeter ;
Flavor and odor.....	25	.....	{ Odor
			{ Flavor.....
Visible dirt.....	10	.....	.....
Fat	10	.....	Per cent found
Solids not fat.....	10	.....	Per cent found
Acidity.....	5	.....	Per cent found.....
Bottle and cap.....	5	.....	{ Cap.....
			{ Bottle
TOTAL.....	100	.....

Exhibitor,

Address,

(Signed)

Judge.

Date,, 191

(over)

DIRECTIONS FOR SCORING.**Bacteria Per Cubic Centimeter—Perfect Score, 35.**

	POINTS.		POINTS.
400 or less	35	55,000 to 60,000	19
400 to 700	34.5	60,000 to 65,000	18
700 to 1,000	34	65,000 to 70,000	17
1,000 to 2,000	33.5	70,000 to 75,000	16
2,000 to 3,000	33	75,000 to 80,000	15
3,000 to 4,000	32.5	80,000 to 85,000	14
4,000 to 5,000	32	85,000 to 90,000	13
5,000 to 6,000	31.5	90,000 to 95,000	12
6,000 to 7,000	31	95,000 to 100,000	11
7,000 to 8,000	30.5	100,000 to 110,000	10
8,000 to 9,000	30	110,000 to 120,000	9
9,000 to 10,000	29	120,000 to 130,000	8
10,000 to 15,000	28	130,000 to 140,000	7
15,000 to 20,000	27	140,000 to 150,000	6
20,000 to 25,000	26	150,000 to 160,000	5
25,000 to 30,000	25	160,000 to 170,000	4
30,000 to 35,000	24	170,000 to 180,000	3
35,000 to 40,000	23	180,000 to 190,000	2
40,000 to 45,000	22	190,000 to 200,000	1
45,000 to 50,000	21	Over 200,000	0
50,000 to 55,000	20		

Note.—When the number of bacteria per cubic centimeter exceeds the local legal limit the score shall be 0.

Flavor and Odor—Perfect Score, 25.

Deductions for disagreeable or foreign odor or flavor should be made according to conditions found. When possible to recognize the cause of the difficulty it should be described under Remarks.

Visible Dirt—Perfect Score, 10.

Examination for visible dirt should be made only after the milk has stood for some time undisturbed in any way. Raise the bottle carefully in its natural, upright position, without tipping, until higher than the head. Observe the bottom of the milk with the naked eye or by the aid of a reading glass. The presence of the slightest movable speck makes a perfect score impossible. Further deductions should be made according to the amount of dirt found. When possible the nature of the dirt should be described under Remarks.

Fat in Milk—Perfect Score, 10.

	POINTS.		POINTS.
4.0 per cent and over	10	3.2 per cent to 3.3 per cent	6
3.9 per cent to 4.0 per cent	9.8	3.1 per cent to 3.2 per cent	5
3.8 per cent to 3.9 per cent	9.6	3.0 per cent to 3.1 per cent	4
3.7 per cent to 3.8 per cent	9.4	2.9 per cent to 3.0 per cent	3
3.6 per cent to 3.7 per cent	9.2	2.8 per cent to 2.9 per cent	2
3.5 per cent to 3.6 per cent	9	2.7 per cent to 2.8 per cent	1
3.4 per cent to 3.5 per cent	8	Less than 2.7 per cent	0
3.3 per cent to 3.4 per cent	7		

NOTE.—When the per cent of fat is less than the local legal limit the score shall be 0.

Solids Not Fat—Perfect Score, 10.

	POINTS.		POINTS.
8.7 per cent and over	10	8.1 per cent to 8.2 per cent	4
8.6 per cent to 8.7 per cent	9	8.0 per cent to 8.1 per cent	3
8.5 per cent to 8.6 per cent	8	7.9 per cent to 8.0 per cent	2
8.4 per cent to 8.5 per cent	7	7.8 per cent to 7.9 per cent	1
8.3 per cent to 8.4 per cent	6	Less than 7.8 per cent	0
8.2 per cent to 8.3 per cent	5		

NOTE.—When the per cent of solids not fat is less than the local legal limit the score shall be 0.

Acidity—Perfect Score, 5.

	POINTS.		POINTS.
0.2 per cent or below	5	0.22 per cent to 0.23 per cent	2
0.2 per cent to 0.21 per cent	4	0.23 per cent to 0.24 per cent	1
0.21 per cent to 0.22 per cent	3	0.24 per cent or over	0

Bottle and Cap—Perfect Score, 5.

Bottles should be made of clear glass and free from attached metal parts. Caps should be sealed in their place with hot paraffin, or both cap and top of bottle covered with parchment paper or other protection against water and dirt. Deduct for tinted glass, attached metal parts, unprotected or leaky caps, partially filled bottles, or other conditions permitting contamination of milk or detracting from the appearance of the package.

REQUIREMENTS FOR CLEAN DAIRIES

TO BE POSTED AT DAIRIES

Stable yards must be clean and well drained, and the manure removed frequently.

The water supply must be plentiful and pure.

Stables must be clean, light, roomy, well ventilated, and whitewashed at least twice yearly.

The cows should be bedded with clean material and stables should be kept free from manure.

No sweeping or cleaning of stables should be permitted while milking is in progress.

The windows and doors should be screened to protect milk from the flies.

When feed is kept in the loft the ceiling should be tight to prevent the falling of dust and chaff into the milk.

The cows should be healthy in every way and should not be milked within thirty days before or six days after calving.

Cows should not be fed upon putrifying slops of any kind.

Filth should not be allowed to cake upon the cows and the udder should be washed and dried before milking.

The milkers should be clean and healthy and no person exposed to any contagious disease should be employed about a dairy.

Milkers must wash their hands before milking.

The milk room must be used for no purpose other than the handling of milk and must be clean and well ventilated.

Milk should be removed from the stable promptly to the milk room and cooled immediately.

All utensils used in the care and handling of milk, including bottles, must be washed and sterilized with boiling water or live steam after each using.

Milk must not be chemically preserved or adulterated.

Milk must not be delivered in bottles that are to be returned, to any house where any contagious disease exists.

HELPFUL FORMULA FOR CLEANING UP DAIRIES

WHITEWASH

Slack 100 pounds quick lime, and add water up to 60 pounds. To each quart of this mixture add five quarts of water. Add to this 1 pound of salt dissolved in warm water. Stir well and apply hot.

*GOVERNMENT WHITEWASH.

Slack one-half bushel unslacked lime with boiling water, keeping it covered during the process. Strain and add one peck of salt dissolved in warm water, 3 pounds of ground rice boiled to a thin paste, $\frac{1}{2}$ pound powdered Spanish whiting, 1 pound clear glue dissolved in warm water. Mix these well together and let the mixture stand for several days. Keep the wash thus prepared in a kettle or portable furnace and when used put it on as hot as possible with a paint or whitewash brush.

DISINFECTANTS

Deadly Poison. Bichloride of Mercury.—Corrosive Sublimate, 1 ounce to 8 gallons of water. 1 part to 1000 parts. First dissolve the poison in hot water and then dilute. Apply with brush or spray.

Sulphate of Iron.—Copperas. (Cheap and good.) Dissolve as much copperas as the desired quantity will hold. Apply with sprinkler. Lumps of dry copperas are useful for purifying drains.

After a stable has been disinfected, it should be allowed to remain empty several days for a thorough airing.

All stables from which any animal has been removed suffering with a contagious disease, such as tuberculosis, abortion, mammitis (garget,) etc., should be thoroughly disinfected.

Corrosive Sublimate. (Twice as expensive as copperas.) Do not keep in metallic vessels. Use earthenware.

Soluble in 16 pints of water at 59° F.

“ “ 13 “ “ “ “ 77° “

“ “ 2 “ “ “ “ boiling.

Deadly Poison. Antidotes:—Emetics, white of eggs, castor oil, milk in abundance, table salt.

* From Farmers' Bulletin No. 63, U. S. Department of Agriculture.

SUMMARY

POINTS TO WHICH THE PRODUCER SHOULD GIVE HIS ATTENTION

1. Be sure that you are producing clean milk from healthy cows, and that your cost of production is not too high.
2. Keep only cows that are good and persistent milkers,—6000 to 8000 pounds per year.
3. Clean up your barns and cows and keep them clean. Clip long hairs on the cows' udders, bellies and tails.
4. Replace rusty cans with new ones.
5. Put a coat of whitewash all over the inside of your cow barns twice each year.
6. Let in all the sunlight you can.
7. Give the milkers something clean to put over their milking clothes when milking. White suits are best, but anything clean will do.
8. Improvise something for each man to wash his hands in before milking.
9. Provide a dry towel for him on which to dry his hands before milking.
10. Have the milk from each cow carried by the milker (or poured thru a clean short-jointed pipe) to another room from that in which the milking is done.
11. *Have the milk cooled and sealed up as quickly as possible and keep it cold.* See that this is done each day and the improved product will command an increased price, if cooperation among the producers is maintained.

POINTS FOR THE DISTRIBUTOR

1. Encourage production of good milk.
2. Handle the best milk obtainable.
3. Do all possible to have it reach its destination in the best condition.
4. See that all containers are properly cleansed and sealed.
5. Provide proper shelter and refrigeration in transit and storage.
6. Try to avoid delay in delivery.
7. Create a demand for pure milk by:
 - a. Grading your milk.

- b. Causing the grade to be distinctly labeled, thus making the inferior grades distinguishable at sight.
- c. Fixing the price according to the quality.
- d. Keeping the standards of grade up to the price.

POINTS FOR THE CONSUMER

1. Milk is a food easily contaminated.
2. All milk is not of the same food value.
3. Improper handling decreases that value from a sanitary and hygienic standpoint.
4. Get such information as will enable you to purchase milk intelligently. On the basis of 100 for proper sanitary conditions, the average score for dairies supplying large cities and towns is below 60.
5. Since modern requirements compel the distributor of milk to deliver an improved product, transportation companies should be required by law to safeguard the milk properly in transit, to carry it to its destination promptly and regularly.
6. Help stimulate the production of clean milk by aiding the distributor to secure a market for the improved product at a price commensurate with its value.
7. Know the kind of milk you want. Know its value and pay the price as long as the product is up to the grade standard.
8. Milk, as soon as delivered, should be put in a cool place and so covered as to keep out odors, dust and germs.