

CHAPTER 3—MILK

Jack Lait's dairy farm.**Milk production an exacting business.**

There were 20 million milk cows in the United States in 1954. Only half of them, 10.7 million, were on commercial dairy farms; but this half produced four-fifths of the whole milk sold for consumption as fluid milk, condensed milk, and cheese. On the other hand, the dairy farms produced less than a fifth of the cream sold, largely to be made into butter. The rest came from farmers who did not make dairying their main business.

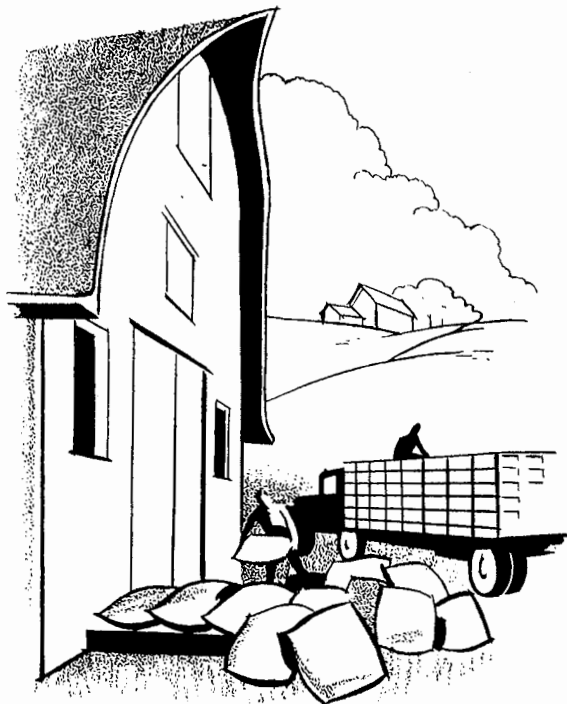
The principal milk-producing region in the United States is the Northern dairy belt. It extends from New England through Wisconsin and Minnesota and is divided into five major dairy areas. The oldest of these is the Northeast dairy area, which takes in Maine, New Hampshire, Vermont, most of New York, and parts of Pennsylvania and Massachusetts.

In the heart of this area are the lovely rolling green hills and meadows of south-central New York, where Jack Lait runs a 215-acre farm with some 38 head of cattle—24 of them milking cows and the remainder young stock.

Jack Lait is not a large-scale producer. His gross income in 1954 was a little over \$7,000, which puts him in what the Census calls Economic Class III; the big Class I dairy farm would probably gross five times as much, around \$35,000. Eighty to ninety percent of his returns comes from whole milk, though the sale of cattle and calves brings in around \$500 a year; few people realize that a considerable portion of the beef marketed in the United States comes from cows culled from dairy herds, and bull calves are of course ordinarily sold for veal. The Laits usually have a pig or two and some 60 to 70 chickens, which provide a little cash from the sale of eggs; but on the whole, the business is strictly dairying, for the fresh milk market. An exacting business it is too, requiring meticulous attention to detail, with a couple of dozen cows to be milked at least 730 times a year, and half again as many to be fed, watered, and cleaned up after just about as frequently. Of all farmers, the successful dairyman has to have a temperament peculiarly suited to his work. "The eye of the master fattens his cattle." It must be a calm as well as a knowledgeable eye; for if the ruminating cow seems to be as placid as a statue, the fact is that she is singularly sensitive to good or bad treatment and that even a change in the daily routine can have a prompt effect in reducing her milk production.

True conservation farming.

The soil here is what is known as gray-brown podzolic, leached by the 40-inch yearly rainfall and developed under the immense forest that originally covered this area. It is not particularly fertile but responds well to manure and to the fertilizer which the dairy farmers use as liberally as they can afford to. The system of farming is calculated to keep the soil in good condition, for this is primarily a hay-and-pasture area, with a minimum amount of land in row crops. Of the Laits' 215 acres, 70 are harvested cropland, and most of this is hay; there are hardly 20 acres in oats and corn, the latter grown for silage. The total pasturage adds up to a hundred acres, about a fourth of it pastured woodland. Another 25 to 30 acres is in woodland not pastured. So more than nine-tenths of this farm has a year-round vegetative cover such as might gladden the heart of a conservationist. The whole countryside, in fact, looks as pastoral as though it had stepped out of a poem by John Milton.

Jack Lait's invisible partners.

This does not mean, however, that the dairy cows of the area manufacture their milk entirely from grass and clover. They also get carefully calculated rations of grain and concentrates. But Jack Lait does not produce this part of the feed. Like the other dairymen of the region, he has it shipped in from the Middle West. If he had to raise all his feed himself, he could keep only half as many cows on the same amount of land. By having other farmers raise some of it, he can about double his production. Expensive as this process is, the demand for fresh milk in the cities and towns of this most densely populated part of the United States is so great that it pays. In effect, then, a sizable share of Jack Lait's milk production comes from Midwest soil, and Midwest farmers are unseen partners in his business.

In fact, of all farm businesses dairy production is one of the most intricate, integrated, and highly organized within and among producers and handlers. This is fundamentally because of the nature of milk.

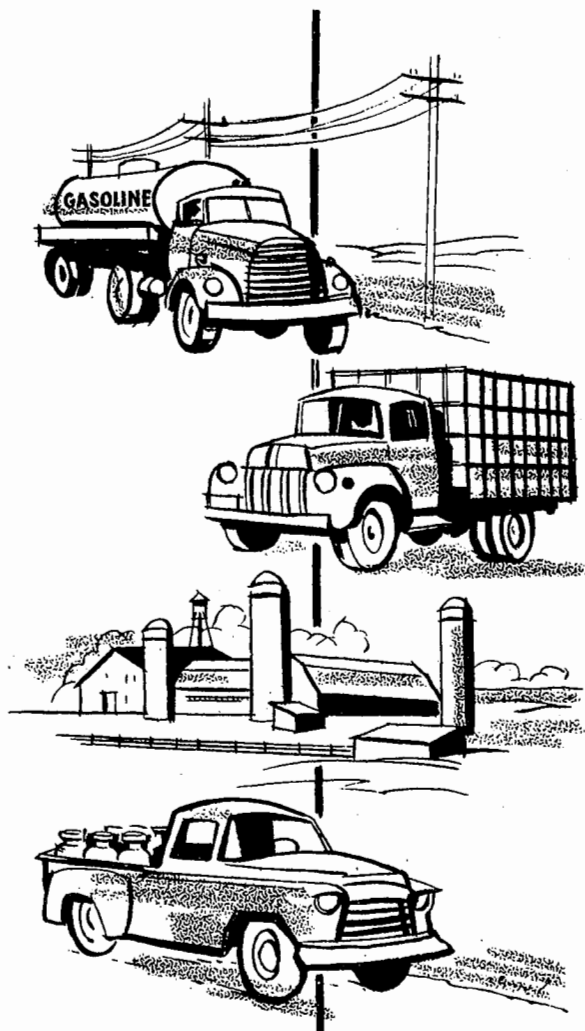
The universal food of youngsters.

Infants the world over start life with milk as their only food. In the United States they graduate from the breast to cow's milk; and from then on, the milk of cows is the most universal and important food of every American youngster, though children in many other countries are not so fortunate. Increasingly it has become an important part of the diet of all young people, even up to the age of 20 or so, and nowadays of people from 20 on. In fact this most nearly complete food has so grown in popularity, largely as a result of modern nutritional research and education, that the per capita consumption of milk and milk products—other than butter—increased about a fifth from 1925 to 1954. Though milk is not in the same category as air and water from the standpoint of human need, in this country it is probably the most nearly indispensable food; and if some catastrophe suddenly cut off the milk supply of any sizable part of the population, the result would be calamitous. At the same time, this well-nigh indispensable food is peculiarly perishable, becoming loaded with germs when it is wrongly handled and requiring at every stage from production to consumption the utmost cleanliness, sanitation, refrigeration or other sanitary safeguards, and dispatch.

Safeguarding the milk supply.

So the United States economy, with its rapidly growing nonfarm population and rapidly shrinking number of farmers (in Jack Lait's part of the country, central New York, less than 15 percent of the population are farmers), has developed a remarkably complex milk industry. The producers themselves are well organized in most of the big dairy areas—so well that they can register effective protests when they think something is seriously wrong with prices or marketing conditions. Since 1937, a Federal law, the Agricultural Marketing Agreement Act, has operated in most of the major areas (except where it is not needed or where there are adequate State controls) to fix the prices handlers must pay for milk and prescribe the method of prorating the returns to producers. This is a very complicated procedure since the price varies according to the use to which the milk is to be put, which in turn varies with the area and the season, and also according to the fat content and quality of the milk, the price and supply of feed locally available, handling costs, and other factors. The law, based on the fact that milk is so peculiarly essential a food, provides for public hearings and is designed to insure an adequate supply, adequate returns to producers, and orderly marketing in the public interest. In addition, of course, sanitary regulations govern production and handling from the cow's udder through collection and pasteurizing and bottling to the ultimate retail outlet, and they are especially strict in the case of milk to be used fresh.

No farmer can go it alone.



The general truth that no farmer today can be self-sufficing or independent in the sense that almost all farmers used to be applies with particular force to dairymen in the position of Jack Lait. At one end, he is dependent on others for an important part of his feed. At the other end, his product has to be taken off his hands regularly, promptly, and efficiently, and go through an elaborate, rather costly distribution system. He is subject to a cost squeeze at one end and a price squeeze at the other that might crush him without some such protection as the marketing agreements provide. Even so, he has to do an increasingly efficient production job to stay in business, and this requires cooperation of another sort.

As in all branches of agriculture, two factors have a particularly vital bearing on the efficiency and profitableness of a dairy operation—how much production per cow?—how much milk per man-hour of labor?

Dairy-cow breeding program.

Of the various elements that determine the former, breeding is the most important. The average production of United States dairy cows has been steadily rising. From an average of 4,167 pounds a year in 1924 it has gone up to 5,512 in 1954, an increase of almost one-third in 30 years. To a considerable extent this is due directly or indirectly to the nationwide Dairy Herd Improvement Association (DHIA) movement which began in the United States in 1906 (having originated in Denmark) and had spread to about 21,000 herds by 1956. In the interval, two simpler plans adapted to smaller herds, the Weigh-a-Day-a-Month and the Owner-Sampler programs, grew out of the DHIA movement; and the cow-testing, recordkeeping habit became so widespread that it was possible to inaugurate the national Proved Sire Program in 1935.

Throughout the country there were some 2,266 associations in the DHIA program in 1956. Each association has a supervisor who spends one day a month at each member's farm and makes an official record of each cow's production, feed consumption, etc., for that day. This costs the producer about \$0.40 a cow a month or, say, about \$105 a year for the average of 22 milking cows in a herd the size of Jack Lait's. In the two other plans the owner himself does the weighing and recordkeeping. The Owner-Sampler plan costs about \$0.25 a cow a month, or some \$66 a year for a herd the size of Lait's, and the Weigh-a-Day-a-Month plan (which omits butterfat testing) about \$0.05 a cow a month—\$13 a year for a herd the size of Lait's.

In addition to these programs involving the county agents, the State Extension Service, and the Federal Government, there is the work of the breed associations, which keep official Herd Improvement Registry (HIR) records of all the animals in purebred herds, and in the case of some breeds, Advanced Registry (AR) records of selected animals. Finally, the Proved Sire Program makes systematic use of the production records of all the daughters of each sire to determine his ability to raise production levels when bred to cows in a given herd. A dairyman who uses only proved sires, selected to fit the production of his particular herd, should be able to increase yields consistently with each new generation.

Improvement more rapid than ever.

Now a new element has come into the picture which promises a far more rapid advance in average production than could possibly have been achieved before. This is artificial insemination. The first United States artificial breeding association for dairy animals was organized in New Jersey in 1938. Within two years a million cows were involved in these organizations. Artificial breeding can extend the merit of a good sire from the normal 40 to 50 cows a year by natural mating to 5,000 or even 10,000; and with further technical improvements the number may be increased before many years to 25,000. Moreover, distance is no barrier since the seminal fluid can be shipped long distances, even overseas, under refrigeration. For a small herd the cost of artificial breeding is far less than that of keeping a bull; the dangers of handling these animals are eliminated; and the dairyman is saved the slow and often disappointing process of proving his own bulls by breeding them and raising all the daughters to producing age. Artificial insemination also prevents the spread of certain diseases. Proved sires are now used for about two-thirds of all cows bred artificially, and the other third are bred to bulls of exceptional merit in the process of being proved.

Production up, feed costs down.**MILK PER COW**

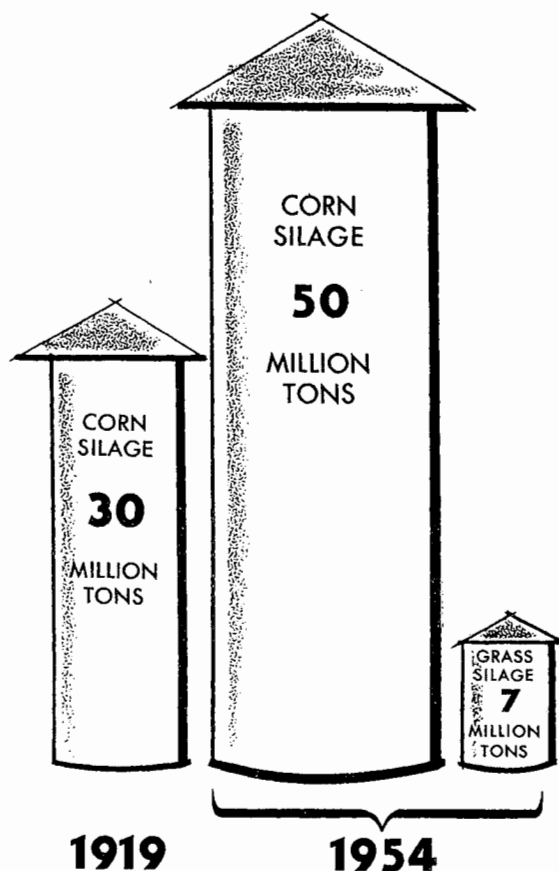
At least half the cost of producing a hundred pounds of milk is the cost of the feed. A cow weighing 1,200 pounds and producing 4,000 pounds of milk a year requires just as much feed every day to maintain herself as does a 1,200 pound cow producing 14,000 pounds of milk. All the latter needs is enough extra feed to produce the extra quantity of milk; she needs nothing extra for maintaining life processes. The result is that the cost of feed per 100 pounds of milk drops rapidly with higher production. DHIA records for 1953-54 show that for a cow producing 4,000 pounds the feed cost is \$3.15 per hundred pounds. For a cow producing 14,000 pounds the feed cost is \$1.61 per hundred pounds—about 50 percent less.

The average DHIA cow in 1954 produced 9,363 pounds of milk. Jack Lait's herd is far below that figure, averaging about 6,600 pounds. His milk sales per cow were about \$260 in 1954, whereas herds in the same area averaging 8,000 pounds brought returns of more than \$300 per cow. The Lait's probably do the best they can with the limited resources of a \$7,000 gross income—which nets a good deal less than half that. At any rate Jack is among the 10 percent of producers who are well aware of the relation between production levels and costs, keep careful records, cull their cows, use the better producers for breeding, and follow a program calculated to upgrade the herd. At best this is a slow process, but it would be far slower without the widespread cooperation between producers and scientists involved in the recordkeeping, breeding, and artificial insemination organizations.

Feed the major expense.

We noted that Jack Lait's milk sales per cow amounted to some \$260 in 1954. To get this return he had to spend \$100 per cow on grain and concentrates, or a total of \$2,400 for the 24 milkers. Nor is this all, because the \$275 he spent for fertilizer and lime to spread on pasture and cropland was an indirect feed cost, and so was some of the \$365 for gas and oil, and the \$120 for machine hire, and the \$370 for hired labor to supplement the work of himself and his family; so that in fact most of the direct production expense of \$3,500 to \$3,600 given in Census figures went for feed. Expenditures for seed and for machinery repair, not reported in the Census of 1954, would add a little more.

So Jack Lait tries to figure out rations that will keep feed costs down as much as possible. Roughage—pasture, hay, ensilage—is the cheapest source of energy and also provides a good deal of protein, especially if the roughage is high quality clover or alfalfa. He gives the animals all they will eat; a cow will clean up 50 pounds of corn silage a day in the barn, and 20 to 25 of hay a day even when on pasture. But milk is 3.6 percent protein, and a sizable amount of this most expensive feed ingredient must be fed daily to keep up the milk flow. The aim is to get it from the cheapest available source. Corn is 7 percent protein, oats 10 percent, barley 9 percent; Jack may use one or all in various proportions, plus soybean or linseed meal or wheat bran or some other concentrate running much higher in protein than the grains. In the end he comes out with a mixture averaging, say, 16 percent protein if his hay is not of the highest quality, or 14 percent if it is.

Emphasis on grass.**Mastitis the biggest disease problem.**

The cost of high-protein rations, especially in a grain deficit area such as Jack Lait's, puts increasing emphasis on getting all the nutritive value possible out of the roughage part of the feed. Partly this is a matter of pasture management. Pasture forage changes in composition and nutritive value with the seasons of the year and the stage of maturity of the plants, and fertilized grass may be twice as high in protein as unfertilized. In the case of bluegrass, for example, the use of manure may mean a yearly increase of as much as 325 pounds of protein to the acre. This is as good as feeding 800 pounds of soybean meal of 41 percent protein content. Using fertilizer and manure also stimulates new growth and makes the grass more appetizing to the animals.

Better ways of handling and preserving forage are equally important. More and more hay, for instance, is being chopped in the field, blown onto wagons, blown into the barn, and artificially dried, to save not only labor but the maximum amount of nutrients. Also, more and more farmers are turning grass and legumes into silage, which preserves the nutritive values of the green plants better than any other method. The fine-cut fresh material is packed tight in the silo, usually with molasses or some other carbohydrate added to feed the bacteria that produce the lactic acid needed to preserve the silage; or more recently sulphur dioxide gas is injected into the ensilage as the cheapest kind of preservative. This grass silage is often fed at the rate of more than 100 pounds a day per cow. Good milk yields can be produced on roughage alone with this kind of feeding. They are not as high as with grain and concentrates, but the economics of production may force a stronger trend toward straight roughage feeding in some areas.

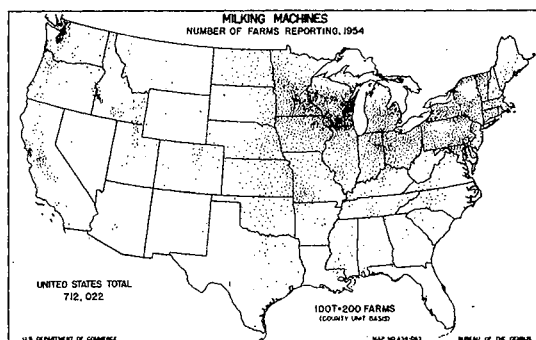
Prevention and control of disease is also more or less constantly on Jack Lait's mind. Fortunately, tuberculosis is now completely under control, as all herds are tested regularly. Bang's disease is still responsible for losses amounting to \$100,000,000 a year, but testing, vaccination of calves, and other measures have achieved a considerable degree of control.

The most common and serious disease is mastitis. Sooner or later practically every cow in the United States gets this udder infection, which always brings a temporary and sometime a permanent reduction in milk yield, boosts the bacteria count of the milk, and may in extreme cases ruin whole herds. Losses are estimated by the United States Department of Agriculture at \$225,000,000 a year. No dairyman can hope to succeed who is not constantly on the alert for mastitis and conscientious in preventing and controlling it. Several kinds of micro-organisms cause the disease, particularly streptococci and staphylococci. At one time there were high hopes that penicillin might completely control mastitis, but there are too many causes for any one remedy to be effective in all cases. Good dairymen have learned that they can minimize the damage by very careful herd management, unremitting emphasis on sanitation, periodic testing of all animals, accurate diagnosis of those affected, and treatment with the proper drug, depending on the cause in each specific case.

A horse-and-tractor farm.

From the standpoint of labor-saving devices, Jack Lait is reasonably well equipped. Like more than half the dairy producers in this area, he still uses both horse and gasoline power for field work. The biggest labor saver in harvesting is the field forage harvester, a machine that not only cuts and chops standing corn, grass, and legumes for ensilage, but can also be adapted to picking up and chopping hay and straw from the windrow. These machines, first introduced about 1920, are becoming so popular, especially in dairy areas, that the number on farms jumped from 80,000 in 1950 to 200,000 in 1954. Though they represent a considerable investment, one-third of those in the East were owned by farmers with less than 180-acre farms. In many cases the cost is reduced by joint ownership or by doing contract work for other farmers.

Milking by machine.

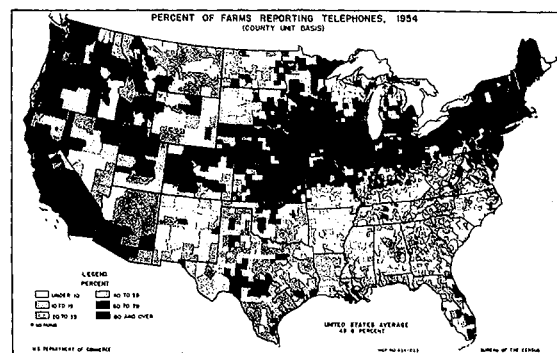


The most universally used mechanical device among dairy farmers is of course the milking machine; 90 percent of the producers in the Northeast area had them in 1954. This machine takes the tediousness out of the milking chore. Each machine more than doubles the number of cows one man can handle in an hour, and he can run several machines simultaneously. Vacuum cups attached to the four teats are actuated by rhythmic pulsators that suck out the milk, which is emptied into a container; or in the most up-to-date and economical method, it is passed along through a pipeline to a stainless steel tank in the milkroom, where it is cooled by refrigeration and stored until the refrigerated tank truck of the dairy company collects it each day, all without any direct handling and therefore with greatly reduced chances of contamination.

The well-run farm.

The Lait's big, clean, well-lighted barn is arranged for handling and distributing feed in carts and for ease in the twice-a-day removal of manure from the gutters, to be spread on the fields daily with a mechanical manure spreader (not pitched with a fork from the tail of a wagon as in the old days) or if necessary stored temporarily under cover to keep the fertility elements undamaged by weather. Jack Lait would like to have one of the gutter cleaners that removes manure mechanically with a revolving-screw pushing device but has not been able to afford it yet.

Home life reflects agricultural advance.

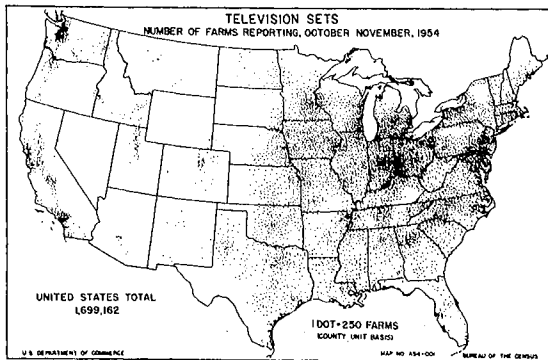


The revolutionary developments that have occurred in agriculture in recent decades are nowhere more strikingly evident than in the home and community life of farm families. Like Dan West and Fred North, John Lait has a good paved road running past the farm, which is not many miles from a good-sized town. He and Mary and the three youngsters do not feel that they live away out in the country, isolated from city life like the older generation. In the car or truck they can get to town quickly to see movies, visit a wide array of shops and stores, eat at a restaurant, and in fact enjoy most of the advantages of a city without the disadvantage of having to live in one. Although they seldom have occasion to travel by air, they are not far from an airport. They have a radio in the house and another portable one that as often as not is in use in the barn. This, with a daily paper delivered at the door, keeps them in touch with the news, daily market developments, and so on. In fact, like city folk, they are constantly bombarded by air with news reports, commentaries, music, drama, advertising, and a regular farm program.

POPULAR REPORT

It need hardly be said that like almost all farm families in their economic group in the area, the Laits also have electricity, telephone, electric refrigerator, and washing machine. They want to get a freezer as soon as they can afford it; over half of the families in their economic group in the area had freezers in 1954.

Television comes to the farm.



Recently the Laits acquired a television set. The purchase of television sets by farm families within the past few years is the most striking current evidence of the rapid disappearance of traditional differences between city and country. The farm Census collected statistics on television ownership for the first time in 1954. In 1950 there were very few sets on farms. By 1954 a third of all the farmers in the United States had them. The concentration is of course greatest where there are nearby broadcasting stations. In this 4- to 5-year period, more than 8 out of 10 farmers in New Jersey bought television sets; almost 8 out of 10 in Rhode Island; about 7 out of 10 in New York, Massachusetts, Connecticut, Ohio; about 6 out of 10 in Indiana, Delaware, Maryland, California; more than 5 out of 10 in Michigan, Iowa, Pennsylvania, New Hampshire. In Montana, Wyoming, and Nevada less than one farm in 10 had television—but many more undoubtedly would have had if programs had been available.

In other words Jack and Mary Lait want the same good things for themselves and their children that city families have, and they get these things as soon as they can afford to. This particular device for entertainment and education is especially well calculated to make them feel in intimate contact with persons and events far beyond their own neighborhood. Also, it is well calculated to stimulate the sale throughout rural areas of the same products that are sold in the cities—clothing, household devices, breakfast foods, and everything else—so that farm and city people will become even more indistinguishable.

Differences in dairy areas.

While Jack Lait's farm is typical of the Northeast dairy region, conditions vary considerably among the different major areas, of which there are 4 others—Eastern Ohio-Western Pennsylvania, Central Michigan-New York Lake Shore, Northern Lake, and Northern Woods. The Northern Lake area, for example, produces only twice as much milk as the Northeast area but 10 times as much butter and 16 times as much cheese. In fact, the North Central States produce 80 percent of the United States butter supply, about 79 percent of the American cheese, 65 percent of the farm-type cheeses, and 50 percent of the evaporated and condensed milk. But as we have noted earlier, much of the cream supply, which goes into butter, comes from farms where dairying is secondary to other kinds of production.

Besides these main dairy areas there are seven smaller ones where dairying is important—Nashville Basin, Gulf Coastal, Ozark-Springfield, Snake River-Utah Valley, Southern California, Sacramento-San Joaquin, Puget Sound-Coastal.

Of all the dairy areas, Southern California is the most unique, not to say fabulous. Here a handful of farmers, comparatively speaking, have made Los Angeles the leading county in the United States in milk production and number of milk cows. Of 23,847 commercial farms in the Southern California area in 1954, only 1,101 were dairy farms, four-fifths located around Los Angeles. The herds run from 200 to 300 cows each. Average sales in 1954 were \$107,000 per farm, over nine-tenths from dairy products. Average production per cow was 11,112 pounds and average sales per cow \$548. Total investment per farm averaged \$136,502. Most of the farms do not raise their own feed; they buy high-quality baled alfalfa hay, often trucked from considerable distances, or fresh-cut green alfalfa delivered daily by truck. Cows are replaced every two to three years by animals not raised on the farm but bought from other farmers, often in distant parts of the country. The average expenditure for feed in 1954 was \$48,000, and for labor, \$15,000. One man handles as many as 60 cows. This system of utilizing the cow's endocrine system to produce milk in big, highly specialized, biological factories seems to be a product of climatic and economic factors in that particular area.

The Los Angeles area is an extreme case, not likely to be duplicated elsewhere. By contrast with the average investment of more than \$135,000 per farm there, Jack Lait's total investment is \$24,000—\$14,000 in land and buildings, \$10,000 in machinery and livestock. But in his area as elsewhere, the general trend is toward larger farms, bigger herds, more production per cow, more machinery, heavier investment, an increase in the proportion of farms in the higher income brackets—more of almost everything, in fact, except low-income producers and young people to go into dairying.

