MINNESOTA FEED SERVICE

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Production Records—A Key to Better Dairying

HAROLD SEARLES *

Some Minnesota farmers today are losing money every hour they work with dairy cows. Others are getting as much as $1.22 per hour or more.

The average farmer earns about 9 cents an hour for his labor on his dairy herd.

Why the discrepancy? Obviously one farmer is doing a good job while the other is not. Feeding, management, breeding—all play a part in the success or failure story of the dairyman.

More and more dairymen are recognizing that keeping production records is an important step in profitable dairy production. Such records tell the dairyman which cow to keep and the amount of feed each cow needs.

The Agricultural Extension Service now has three record-keeping systems, one of which should fit the needs of every dairyman.

The standard DHIA program, which today has 136 associations and covers 2,800 farm herds, is one. Another older system is the owner-sampler plan. The new system recently introduced is the Weigh-A-Day-A-Month plan. This article will explain each of these systems.

Why Record Plans Are Needed

The present price and cost situations make it imperative that each cow in the herd return a profit. Good cows cannot carry the poor ones and keep the herd profitable. It isn't possible for the low-producing herd to return the owner a decent income.

Our chart shows the costs and labor return for either individual cows or for herds at different levles of production. The figures are based on 1955 DHIA records covering 2,800 herds. Neither prices nor costs have changed greatly since then.

The labor income for the average milk cow of $9 per year tells one reason why the number of dairy herds is declining rapidly. Many herds and cows are below this, so return neither labor income nor market price for the feed. This means that labor is wasted and the whole farm income lower because the cows were kept on the farm.

Labor returns for the 400-pound cow, however, will explain a part of the reason why many herds are getting larger. These cows return their owners $122 each, or $1.22 per hour for labor. Most dairymen can reach this 400-pound level; whole associations of 25 members are reaching it now.

The price of butterfat would have to be $1.34 a pound for the average cow or herd to return the same labor income as the 400-pound herd does with butterfat at 87 cents a pound. Butterfat at $1.34 would increase labor income $113 per cow for the average herd, and $204 per cow for the 400-pound herd. The labor income would be $1.20 vs. $3.26 an hour.

Looking at it another way, what would it take to get a $3,000 labor income for these different herds? Twenty-five 400-pound cows would do it today, but it would take 333 of the average producers! In fact, it is impossible for the average producers to reach the $3,000 income, because family labor could not care for that many cows and the income would not permit the hiring of any help.

Twenty-five 400-pound cows put 268,775 pounds of milk and 10,000 pounds of butterfat on the market. The 333 average producers (221-pound cows) put 1,881,783 pounds of milk and 73,593 pounds of butterfat on the market—only a little more than seven times as much! Our market situation would be healthier if some of the unprofitable cows were removed from our herds. The owners would also be better off.

Production records on every cow would show those that are paying for

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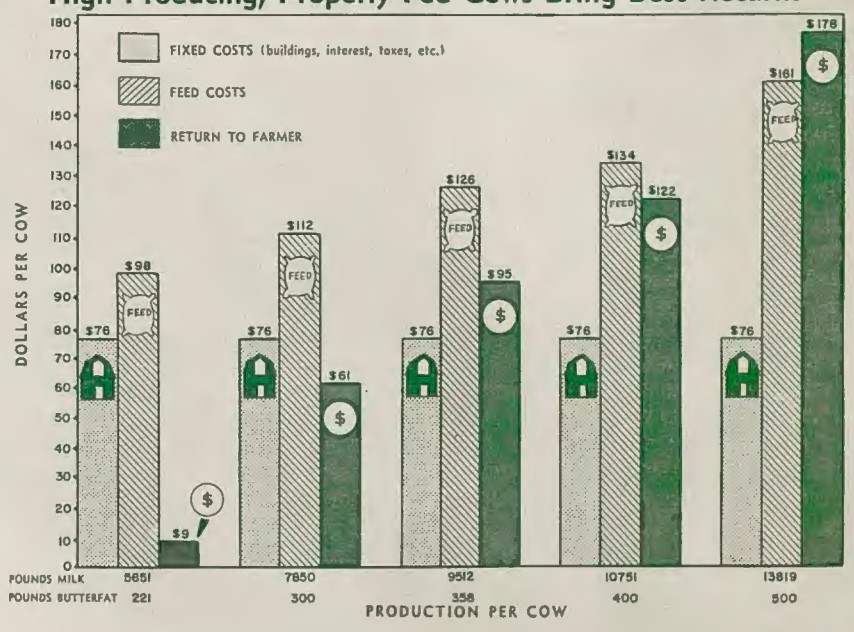
High Producing, Properly Fed Cows Bring Best Returns



* Extension Dairyman.

Internal Parasites of Cattle

HENRY J. GRIFFITHS *

A program of parasite control on Minnesota farms will result in healthier, faster growing, and better finished cattle. All this will mean a better profit margin for the farmer.

Cattle may become infected with many kinds of internal parasites. Numerous protozoan (single-celled) and helminth (worm) parasites occur frequently in cattle, often causing large losses. Cattle of all ages and breeds are hit, though the ill effects are more noticeable in animals up to 2 years old.

This article reviews the helminth or worm parasites of cattle. It does not cover the protozoan diseases such as coccidiosis, anaplasmosis, and trichomoniasis of cattle.

Conditions Favoring Parasites

To be successful, a helminth must be able to get into an animal, grow, mature within its host, propagate, and produce offspring which in turn find their way into another animal. With present-day husbandry practices, the worm parasites successfully maintain their kind, in spite of our efforts to control them.

The severity of an infection usually depends on the number of invading parasites. When the initial invasion is very large, there are obvious symptoms of parasitism.

With lighter infections, the damage being done by the invaders does not show up as much outwardly. Nevertheless, these low-grade infections are very important, causing continued economic loss and serving as signposts to more serious trouble which may show up later.

Most of the helminth parasites are insidious in their method of attack, and clinical symptoms may be confused with and ascribed to other conditions. It is hard to judge the loss caused directly by helminth parasites since they usually do not cause death.

More often they are associated with hidden economic losses. Some of those are reduced yield and quality; wasted feed and labor; depreciation of animal products, and condemnation of parts and carcasses on slaughter; interference with breeding and reproduction; inefficient utilization of feed; decreased rate of gain and retarded growth; and, perhaps most important of all, lowered resistance to other disease-producing agents.

The important worm parasites of cattle are roundworms, tapeworms, and flukes.

Roundworms

In the digestive tract of cattle there may be found about ten different kinds of roundworms of economic importance. These include the common stomach worm; the medium stomach worm; the hair stomach worm; the hookworm; the minute intestinal roundworms known as cooperids; the small intestinal hairworms; the intestinal threadworms; the thread-necked strongyles; the nodular worm; and the whipworm.

These roundworms all have a direct life cycle and do not require an intermediate host for their transmission. The adult worms in the intestinal tract lay eggs which are passed out in the feces of the animal. Depending on temperature and humidity, the eggs hatch in from 5 to 10 days and develop into infective larvae which can develop into adult worms if swallowed by susceptible grazing cattle.

Lungworms

In the lungs of cattle may be found the thread lungworm, ranging 2 to 3 inches in length. This parasite is especially harmful to younger animals, and severe losses may occur from a verminous pneumonia. Lungworm infections are more frequently seen in cattle grazing on low, wet pastures, or during seasons of prolonged mild, wet weather.

Liver Flukes

Three kinds of liver flukes are found in cattle in the United States. In this immediate area, only the large American liver fluke is found. There is little doubt that heavy fluke infections do harm cattle. Each year, extensive economic loss to the tune of several million dollars results from condemnation of cattle livers in packing plants under federal inspection.

Tapeworms

Several species of adult and larval tapeworms are also found in cattle. Just how much effect these parasites have on their hosts is questionable. Due to their size and impressive length and ease of diagnosis, they are often blamed for extensive losses where perhaps some smaller parasite or disease-producing agent may have been overlooked. Nevertheless, their eradication and control is highly desirable for they do use nutrients needed by the animal itself.

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Parasite Control

Since roundworms cause the greatest loss and disease in cattle, let's consider their control.

To carry on an effective control program, the fundamentals of the biology of cattle parasites must be kept in mind. Prevention can then be practiced cheaply. Although parasites are especially serious in the warmer, more temperate regions, **cold weather offers no protection or insurance against them.**

Accurate diagnosis is important but not always easy. Fecal examination for parasite eggs will, in most instances, indicate whether an animal is infected —but very often heavy damage has been done by the time the parasite has become mature and egg-laying.

Although several drugs may be used effectively for control of parasites, phenothiazine is now the most widely used for intestinal roundworms of cattle.

This remarkable drug has a wide range of application, a high degree of efficiency, a good margin of safety, and can be given in several ways. Its popularity and effectiveness is primarily due to its activity against adult and post-adult stages of a large variety of nematodes of cattle and sheep. It is usually administered in two ways: (1) to treat the animals to remove adult parasites; (2) as a preventive to keep animals from becoming infected with parasites.

Therapeutic doses are administered when animals are known to be infected. Such treatment removes the adult worms and eliminates the source of pasture or feedlot contamination by which other animals become infected. All animals in a herd should be treated, not just those that do not appear to be doing well. The dose may be given as a drench, in a capsule, as a bolus, or mixed with feed.

Whenever possible, prevent cattle from becoming infected. Phenothiazine fed at low levels daily can greatly reduce the worm population by reducing egg production or by making worm eggs incapable of developing into young infective forms on the ground. This

greatly reduces reinfection on pasture or in the feedlot.

For many years, medicated feeds have been used to control various internal parasites. Herd treatment by this method, though lacking the reliability and effectiveness of individual dosing, has proved to be practical. The value of a medicated feed depends on its being able to provide a suitable medicinal agent in effective amounts at the right place and time. Treatment alone is not the complete answer to parasite control. Successful prevention and control comes through treatment supplemented by good management, good feeding, and proper sanitation.

Treat cattle infected with roundworms periodically with phenothiazine. Before the cattle go to pasture in the spring, give the young stock a full therapeutic dose of phenothiazine. Usually this should be an ounce for calves and not more than 2 ounces for older animals.

To destroy those young migrating stages which were not in the intestine at time of the first treatment, give a second treatment a few weeks later. Depending on the parasite problem of the herd, a further dose may be necessary in late fall just before the cattle are housed for the winter. A control and treatment program should be discussed and worked out with the local veterinarian.

To reduce pasture contamination, daily feeding of phenothiazine in addition to therapeutic treatment may be necessary throughout the pasture season. A mixture of 1 part of phenothiazine and 10 parts of loose mineralized salt should be available at all times to young stock and beef animals. If desired, a free-choice mixture may be offered containing 1 part of phenothiazine by weight to 3 parts each of bonemeal, limestone, and salt.

Since phenothiazine is partly absorbed into the blood stream, milk from treated cows may be slightly colored. It should not be used for human consumption until 4 or 5 days after the drug has been administered.

A further control method is the low-level system. This consists of daily feeding of a 2-gram dose of phenothiazine to calves, yearlings, bred heifers, and bulls—but not to milking cows. Before adopting the low-level feeding regimen, see that the cattle first receive a therapeutic dose.

Of more recent introduction is the incorporation of therapeutic doses of phenothiazine in specially prepared feeds or feed pellets. These mixtures are fed for a certain number of days, depending on the anthelminthic content.

DAIRY RECORDS

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neither feed nor labor. One of the three record programs would fit every dairyman in the state. Several counties have as many as six DHIA associations; others have only a few herds in a neighboring county association.

Weigh-A-Day-A-Month

This is the new, simple, lowest cost method of record keeping. It is especially suited to the small herd, or any herd that has not found record-keeping possible up to now. Unlike the standard DHIA, it does not require a certain number of cooperating dairymen to make it go.

The farmer weighs the milk from each cow one day a month, recording it on the form mailed to him once a month. These records are sent to a central office. There they are calculated to give the monthly milk production for each cow and her accumulated total.

The plan will give the monthly herd average and, at the end of the year, the total for each cow and herd-average per cow. If the farmer furnishes the milk income for the herd and monthly feed costs, the returns above feed cost per cow for the herd for the month and the average for the year will also be figured.

This record will not show the variation in fat production due to difference in butterfat tests. For cows of the same breed in a herd, however, big milk variations point to the good and poor cows.

The cost for Weigh-A-Day varies from county to county, from 60 cents to $1 a cow, with a $5 minimum for the herd for the year paid in advance.

DHIA Owner-Sampler

The Owner-Sampler system operates as a part of the Standard DHIA, differing from it mostly in that the supervisor does not weigh and sample the milk. Instead he figures the record from the weights and samples which the owner takes himself.

It is thus a completely private record of the milk and fat production of each cow. The records cannot be used for sire proving and no publicity is given to them.

It fits the herd that is in a Standard DHIA community where the supervisor has time to do the extra work in addition to handling the records of his standard members.

The cost is about half of the Standard DHIA cost. Average monthly cost is around $4 for 10 cows and 10 cents a month for each cow over the 10. There is room for great increase in the owner-sampler system.

Standard DHIA

"Standard DHIA" is the new designation for the regular DHIA in the nation. It has been in operation in Minnesota since 1910. The first association, in Freeborn County, averaged 186 pounds of fat. Sons and grandsons of the original members are still in DHIA.

In the standard associaiton, detailed records are kept by the supervisor in the DHIA herd book. Each month he records for each cow the daily and monthly milk production, the butterfat test, the fat for the month, and the pounds of feed consumed. These are added to the accumulated total, and at the end of the year the individual cow's record shows milk, test, and fat produced. It also gives the feed cost and the return above feed cost. The record is shown as a 305-day lactation and the yearly total for comparison with other cows of the herd. Calving dates and dry dates are recorded. The calf is identified by sire and eartag number.

For the herd, there is a monthly total production of milk and fat, the feed cost and return above it, and the average per cow. These are also figured for the year, so that progress from year to year can be measured.

The 305-day lactations are reported as completed to prove sires. This is the source of sires for the artificial breeding association. It is also the only check they have on how well the sires are doing in transmitting production.

The Agricultural Extension Service, with the assistance of the USDA, summarizes the records yearly to obtain cost data and other information which can help all dairymen to do a more profitable job.

The various breed associations carry on their official test programs through the Standard DHIA association, under the supervision of the Extension Service.

The cost averages about $8 a month for a herd of 10 cows, and 20 cents per cow for additional cows. Associations with extra-good supervisors may pay considerably more than that.

These three types of production records—Weight-A-Day-A-Month, Owner-Sampler, and Standard DHIA—are in operation in almost every county, under direction of the County Agent. You can get complete information about them from his office.

Water Solubility vs. Citrate Solubility of Fertilizer Phosphates

A. C. CALDWELL *

No one will dispute the current widespread interest in the solubility of fertilizer phosphates. This interest can be attributed to a number of things. Among them are: greater fertilizer use, competition for the fertilizer dollar, entry into the market of completely water-soluble mixed fertilizers, high analysis solids of high water solubility, plus recent research indicating an advantage for water-soluble materials under certain conditions.

This article reviews some of the work on phosphate availability to show more clearly those circumstances under which water solubility might be expected to be an important factor in phosphate use.

Phosphate Solubility Classes

Phosphates may be grouped into these four main classes, based on solubility:

1. **Water-soluble phosphates,** which include monocalcium phosphate and the ammonium phosphates. Examples of fertilizer materials which are almost completely water soluble are the ordinary and concentrated superphosphates —16-20-0, 11-48-0, 21-53-0, phosphoric acid, and mixed liquid fertilizers.

2. **Many solid mixed fertilizers** in which the phosphate is present largely as a mixture of ammonium phosphate (water soluble) and dicalcium phosphate (citrate soluble). The water-soluble phosphate in these fertilizers may be present from approximately 10 percent to as high as 70 percent.

3. **Citrate-soluble phosphates** which are made up of dicalcium phosphate or calcium metaphosphate. According to most fertilizer laws, in order for a phosphate to be labeled "available" it must be citrate soluble (i.e., soluble in a neutral normal solution of ammonium citrate under specified conditions).

4. **Other phosphates** which are essentially neither citrate soluble nor water soluble, such as some tricalcium phosphates and the apatites. Examples of the apatites are most unprocessed rock phosphates.

Soil and Plant Factors Affecting Phosphate Use

There are a number of soil and plant factors which affect the use of applied phosphate. Among the soil factors are the pH and amount of available soil phosphorus. Crops vary also in their ability to use phosphates of various chemical forms.

Experiments have shown non-water-soluble materials like calcium metaphosphate to be as available as water-soluble phosphates like concentrated superphosphates to most crops on acid and neutral soils. On these soils, some vegetable crops like potatoes made more use of superphosphate.

Water-soluble phosphates are better sources of phosphorus to crops like corn and oats when only small amounts are used (such as in starter) on acid soils very low in available phosphorus. There was not much difference in availability of phosphates when water-soluble forms were present to the extent of 50 percent or greater.

On alkaline soils, citrate-soluble phosphates like calcium metaphosphate were not as available to crops as the phosphate in concentrated superphosphate. There are different degrees of utilization of the phosphates, however, depending on the characteristics of the crops themselves. Long-season crops like most legumes are better able to get phosphorus from the less-available phosphates than are short-season crops.

Fertilizer Materials and Use Factors

Rate of application of fertilizer and method of placement are factors to be considered in evaluating phosphate availability. If small amounts of fertilizer are used, such as in a starter fertilizer, it is more important to have a large proportion of it (50 percent or more) water soluble.

Water solubility does not seem to matter much if finely ground materials are mixed with the soils (as would apply when fertilizers are broadcast and worked into the soil). When fertilizers are banded, water solubility of the phosphate is more important.

The presence of other salts in a fertilizer mixture and the form of nitrogen present may influence the absorption of phosphate by plants. The presence of the ammonium ion in a fertilizer, for example, enhances the uptake of phosphorus.

There are other chemical, mechanical, and physical conditions—such as additions of salts and acids, moisture content, rapid or slow drying and cooling—which may affect the water solubility of the phosphorus in mixed fertilizers.

At the present time, a water-soluble phosphorus content of 50 percent seems to be adequate. A recent survey showed that the majority of high analysis mixed fertilizers have 50 percent or more of phosphorus in a water-soluble form.

In the areas in the Midwest where alkaline soils predominate and many of the soils test low in phosphate, the big bulk of the fertilizer sold is high-analysis goods. Therefore, recognition of the importance of water solubility in these areas should mean little change, if any, in methods of fertilizer manufacture or use.

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