

Herd No.	No. of cows.	Average lbs. milk	Yield lbs. fat	Feed cost	Average Profit
1	10	6,298	231	\$40	\$22.98
2	6	3,665	129	\$33	\$ 3.65
3	8	10,123	361	\$50	\$51.23

Lbs. milk	Lbs. fat	Profit	Lbs. milk	Lbs. fat	Profit.
4,345	167	\$ 3.45	7,665	275	\$ 36.65
2,176	78	\$11.24 (Loss)	5,360	191	\$ 20.60
7,672	232	\$23.72	17,615	619	\$126.15

The yield of milk in Herd 3 is almost three times that of Herd 2, but the average profit is fourteen times as great. This is despite the feed costing \$17 per cow more.

Note the difference in the average yields of milk from thirty-six hundred to ten thousand pounds per cow. It would be just as sensible, perhaps more so, to say that the three herds average 6,700 pounds of milk, as to say that your own herd averages so and so. We must study individual performance. It is just a suicidal policy to average good and poor cows, blinding ourselves to the deadening influence of low yields and in-avoidable profits.

The average profit in Herd 2 is just one cent for each day in the year, but the individual returns vary between \$11.24 loss and \$20.60 profit. A consideration of averages without selection on records simply means stagnation.

The poorest cow in Herd 2 is a four-year-old, type of a cow we ought to be without. The searchlight of record-keeping reveals them as dangerous to dairy navigation.

The poorest cow in Herd 1 is a long way below par, or the average profit of the herd. How frightfully unfair it is, therefore, to the best cow in this herd with \$36.65 profit to have the poor one hauled up to the same level in a grossly misleading "average."

Among the best cows note the excellent record of 17,615 pounds of milk from this seven-year-old grade. Even at a feed cost of \$50, her profit is \$126.15; or, compared with the \$3.45 profit from the poorest in Herd 1, actually 36 times as much. The great economy of the really good cow is here manifest.

Investigation at five Centres last year showed 3,188 cows giving an average profit of only \$13.28—no princely return for twelve months' work. It is such figures as these that the work of the Dairy Record Centres aims to thrust upon the attention of our dairymen, so that intelligent and rapid herd improvement may result. The recorders, these consulting dairy specialists, are within the dairy beck and call of the inquiring dairyman in their respective districts, despite distance or weather, and absolutely free of charge. Not much wonder, surely, that there were 14 such recorders last year in place of six the year before, and that more are being appointed. They bring to the farm in their capacity of dairy advisers a wealth of real encouragement, useful suggestion and practical help; each recorder proves the value of adding figuring to farming so that a simple record may assist materially in the dairyman's main endeavor to make each cow pay. That is the keynote of cow testing.

Hence, it is dawning on the indifferent patron and the sceptic that his is the responsibility more than the cow's—his brain must make deductions from his record of figures, his intellect must plan and guide the building and development of the profitable dairy herd. That natural right since the beasts of the field were assigned to his control at creation's dawn should be both his pleasure and strenuous aim to-day.

Record sheets and sample bottles are giving each cow a square deal where before simply reigned mere guess work, palpably unjust to the aristocratic producer as well as to the habitual loafer. Fresh energy and determination are manifest as the benefits of a simple business proposition are taken to heart. Out of chaos and confusion of ideas evolve order, system, satisfaction and profit.

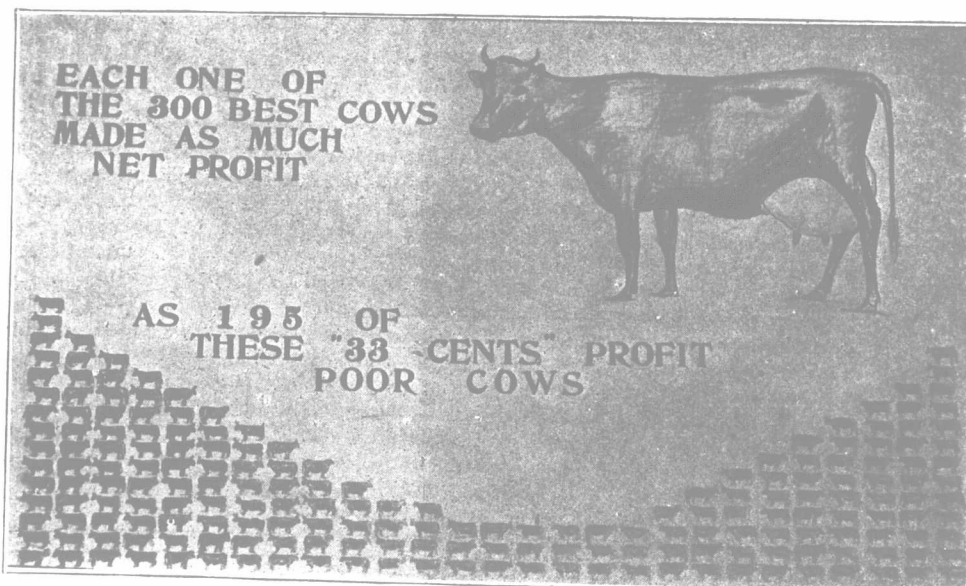
The unmasking of some poor cows, shirkers of their responsibility, does not condemn dairying as a business; it has not led to gnawing misgivings of a dairyman as to his chosen vocation; but, on the contrary, such knowledge has fired a spirit of hopefulness and determination to improve. Really good cows, somewhere least suspected, have been found, and their discovery has proved an incentive to even bigger things accomplished. Here we have real, valuable educational intimate first-hand analysis of immediate surrounding conditions with the drawing out of the owner's best ideas of progress and attainment.

Our recorders found an average of nine cows kept per hundred acres of land. How many acres on your farm does it take to feed one cow? The profit might be increased immensely if the productive capacity of the land were so improved as to support more cows. On some farms visited only 150 pounds of milk were being produced per

acre; while on others the production was as high as 1,750 pounds per acre. The average cost of feed per hundred pounds of milk was found in some cases to be as low as 54 cents for the average of the herd, while in others the average cost from unselected herds was as high as \$1.37 per hundred. If individual cows were considered, of course, these prices would vary still more. No stronger proof could be possibly wanted for the absolute necessity of weeding out, after consulting their records, those cows whose milk costs too much to produce. In probably no other manufacturing industry would cost prices vary in such extraordinary degree. Nothing else but simple record keeping will detect these drones in the hive of dairy industry. Records thus prove themselves a valuable "first aid" to farmers injured by keeping poor cows; they assist to eradicate from the blood of the average man the poison of loose, indifferent ideas of dairying. They inoculate with the microbe of progress, and become serviceable dairy cultures, improvement "starters."

Glancing at all our records in Ontario for last year, the average yield of 3,387 cows was found to be 6,132 pounds of milk, 3.4 test, and 211 pounds of fat. To illuminate the difference in profit per cow, even in bulk like this, I separated carefully the yields of the 300 poorest cows and the 300 best cows. These actual dairy records given us by the men who milk and feed the contrasted cows are indicative of the severe handicap of the average farmer with only average cows, and prove what a perfect food, as well as tonic, records may be to the average man whose ideas on cow testing remain half-starved and undeveloped.

The 300 best cows gave more milk than the 300 poorest by 2,130,900 pounds, and yielded an average profit of \$64.33 per cow, as against a profit of 33 cents per cow from the 300 poorest cows.



It took scarcely one-third of the 3,387 cows to give one-half of the total yield of milk. The feed cost of the poor cows was placed at only \$33, though our lowest average cost at a Record Centre was \$33.21, which would cut even this small profit of 33 cents still lower.

Then look at this fact: That even charging the good cows with feed at \$40, they made a profit of \$61.33, or, compared with their poorer sisters, 195 times as much.

If these 300 poorest cows had given as much milk as the 300 best cows, there would have been an additional income from them of \$21,309. Cow testing must commend itself to the thinking man; it is no fad, but has itself been tested and tried out in the hard crucible of actual farm experience.

SOME ONTARIO INCREASES AFTER THREE YEARS TESTING.

Herd	No. of cows	Present yield lbs. milk	Increase per cow lbs. milk	per cent.
Winchester	14	8,314	1,207	14
Bonards	18	7,380	1,041	16
Brenner	11	7,306	1,719	30
Wooler	10	7,610	2,313	43
Kerwood	10	6,770	2,580	60
Bertie	61	6,326	2,560	68

An average increase easily obtained is 1,100 pounds of milk, 40 pounds of fat per cow.

Ontario has 1,044,000 cows; at only \$10 each the increase might be over 10 millions.

These are herds that records are building. Meditation on the benefits of cow testing has crystallized into action. Cows are sown and dollars reaped.

If all our dairy cows in Canada could be educated to yield only ten dollars' worth of milk more than they do now, the extra revenue would be about thirty millions of dollars.

Taking the Kerwood herd, for instance, the original yield of milk was 4,390 pounds; at a

feed cost of \$40 the profit was \$3.90. Even allowing \$45 worth of feed now to produce the present yield of 6,770 pounds of milk, the net profit is \$22.70. Thus, while the increase in milk yield is 60 per cent., the increase in profit is 482 per cent. Such figures would not be indifferently received by any mercantile firm, and should appeal forcibly to every philanthropic dairyman who is at present boarding the "33-cent" cow referred to above.

RAPID CASEIN TEST.

Perhaps the uppermost question in the minds of cheesemakers to-day is that of the fairest method of paying for milk received for cheesemaking purposes, said Prof. W. D. Walker, of Queen's University, in explaining his new rapid method of estimating casein in milk.

We are all pretty well acquainted with the various methods employed in the past, and know that none of these is directly dependent on, nor bears any direct relation to, the amount of casein in the milk, and yet the casein is the principal constituent of cheese. Almost every dairyman agrees that were it possible for the cheesemaker to determine the casein content of milk without involving too great an expense of time, and without introducing any large complication in computing values, then most assuredly we should pay for the milk according to both its fat and casein contents.

The Walker method, in short, consists in estimating by means of standard one ninth normal alkali, in general use in our cheese factories, the acid liberated from casein by the action of the commercial solution of formaldehyde used so generally as a disinfectant and germicide.

This is done by taking a 16.3 c.c. sample of the milk and placing it in the test cup. The existing acid of the milk is now neutralized by adding the alkali exactly as in the case of the "acid test," after having first added 1 c.c. of the

indicator. We bring the color to a good deep pink. And an excess of commercial formaldehyde solution which has been rendered neutral with alkali, using, of course, a few drops of indicator to show the neutral point. We advise using about 2 c.c. of the formaldehyde solution. The pink color of the milk now disappears at once since the acid of the casein has been set free, or, rather, since the basic function of the casein has been fixed or bound.

We now add the alkali again until we get the same shade of color as we had before we added the formaldehyde. The amount of alkali used in this last titration represents the percentage of casein in the milk. This is obtained, of course, by subtracting the first reading on the burette from the second reading. To eliminate the trouble of this subtraction, a new form of acidimeter has been devised, which is a so-called automatic zero point acidimeter, by means of which the alkali is brought to the zero point in a moment after the first titration, and thus the trouble of subtraction is eliminated. This acidimeter will be placed on the market in a short time, when it will be available, not only as a casein test, but as a general acidimeter for the acid test.

The time required for the complete test, of course, varies with the skill of the operator, but should not occupy more than two minutes. When a large number of tests are made consecutively, the time may be cut down appreciably by taking a number of samples in succession, without laying down and taking up again the pipette between each sample.

The test makes use of only those substances in common use in cheese factories—namely, the standard alkali, the ordinary indicator, and the pipette and acidimeter, with the exception of the formaldehyde, which is a very cheap substance and readily obtained at any drug store.

It is no more difficult to carry out than the ordinary acid test, and therefore can be operated by any cheesemaker.

At the time the details of the test were worked out some months ago, no preservative was in common use which permitted its use with composite preserved samples. During the last few weeks, Prof. Walker has been carrying on a series of experiments to discover a preservative which will preserve milk for a month, and will not interfere with either the test for fat or the casein