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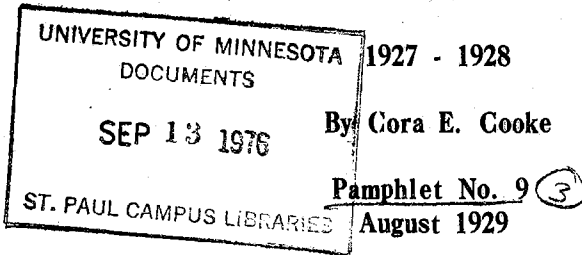
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POULTRY RECORD FLOCKS IN MINNESOTA



Poultry records tell the story of success or failure. A study of the records will reveal the weak points in management as well as the strong points. This study reports results in a number of Minnesota flocks over a period of two years, with illustrations from individual flocks where some special point in management was noted.

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## POULTRY RECORDS - WHAT THEY SHOW

### Poultry Record Flocks in Minnesota for 1926-27 and 1927-28

That poultry is profitable as a farm sideline and even as a commercial enterprise is evident from records of two years supplied by poultry raisers from all sections of Minnesota enrolled in the Record Flock Project. Information secured from such records supplies facts for the use of all poultry raisers in the state as to expected costs, possible returns, desirable feeding practices, and other important phases of poultry production.

#### How Records Are Kept

The project is planned to secure reliable data from all sections of the state. Every county agent is urged to secure cooperators, the number being limited to three per county. The cooperator keeps a daily egg record, an account of all expenses and receipts, including products used at home and farm grown feeds fed and losses from all causes. This information for each flock is reported monthly. Inventories at the beginning and end of the year make it possible to determine the value of the year's business to each flock owner.

Average monthly egg production is figured on the basis of the average number of hens of laying age in the flock during the different months. Annual egg production is based on the average number of hens kept during the year. Feed and other costs are determined in the same way. No separate chick record is kept and all feeds and other expenses are charged to hens. Costs of rearing are estimates based on a few chick records that are received each year. Labor costs are not included since nearly all flocks are of the farm flock size, averaging about 250 hens per farm each of the two years, and it is assumed that the labor would not produce an income from some other source if not used for poultry.

Summary of Facts for Two Years

	1926-27	1927-28
Number farms furnishing complete records	39	46
Average number hens on these farms	9,208	11,386
Largest flock at beginning of year	2,677	2,708
Largest average flock for year	2,111	2,072
Smallest average flock for year	47	32
Average size of flock	236	247
Total eggs laid	1,267,219	1,717,919
Average eggs per hen	137	150
Highest production per hen	214	229
Lowest production	59	46
Total value eggs sold and used	\$31,786	\$48,544.71
Average price per dozen eggs	.27	.34
Average pounds feed per hen (includes feed used in rearing chicks)	89	110
Average feed cost per hen (includes feed used in rearing chicks)	2.09	2.78
Percent adult stock died	13%	12%
Percent chicks died	23%	24%
Total returns (including increase of inventory)	\$46,009.71	\$73,984.39
Total expense (including interest, depreciation and decrease of inventory, not including labor)	\$31,155.51	\$44,970.44
Net return above all costs except labor	\$14,854.20	\$29,013.95
Net return per hen	1.61	2.54

The entire study is, of course, based on average figures. These figures can not be expected to tell exactly what practices must be followed. They do, however, indicate which practices are usually successful, and what general methods in management give the flock owner a good chance to make a profit. Interpreted in this light the comparisons will help to answer some of the questions most frequently asked by poultrymen as to practical methods in feeding, care, sanitation, housing and other factors in successful poultry raising.

How Egg Production Effects Profit

One of the most common questions asked by poultrymen is, to what extent must the flock be forced for egg production in order to be profitable? The best way to determine this is to compare the egg yield with the net returns above all expenses in different groups of flocks classified as to their annual egg records. In the 1926-27 project 39 flocks showed results as follows.

	<u>No. Hens</u>	<u>Eggs per hen</u>	<u>Net return per hen</u>
13 high producing flocks	2920	163	\$2.36
13 medium producing flocks	2011	140	1.77
13 low producing flocks	2277	99	.32

The following year (1927-28) an even more striking effect was shown.

16 high producing flocks	6116	181	\$3.46
15 medium producing flocks	3065	132	1.87
15 low producing flocks	2205	91	.80

It is evident that the profit made per hen increased in direct proportion to the increase in eggs laid. Occasionally a profit is returned in spite of low production. For example, in the 1927-28 project the fifteen low producing flocks with a production of 46 - 116 eggs, one flock made a net return of \$3.21 per

hen. However, only two of these 15 flocks made a net return above the average for the 46 flocks and the low flock showed a loss of 30¢ per hen. On the other hand, in the high production group, eggs ranging from 156 - 229 per hen, eight flocks made a net return above average, the highest being \$6.59 and the lowest \$1.13 per hen. In other words, low net return is the rule rather than the exception in low producing flocks.

Culling Important.

The flock that may be considered the most successful from the standpoint of production and return per hen is one that averaged 229 eggs per hen and \$6.59 per hen net return. Such performance might seem highly improbable if not impossible if one failed to consider how the average production was figured and how this flock owner managed his flock so that average production was kept at a high point throughout the year. This flock, owned by S.V. Wirta of St. Louis county, started with 495 Single Comb White Leghorn hens and pullets, in November 1927. Unprofitable birds were culled out regularly during the year so that the monthly production never fell below 9.4 eggs, and, averaged from 13.9 to 23.2 during eleven months. By the end of the year only 247 hens remained and the average size of the flock for the year was 388 hens. Had Mr. Wirta kept his entire flock throughout the year the average production would have been about 179 eggs per hen, a reduction of 50 eggs per hen. This point is illustrated in another flock which averaged 172 eggs per hen, starting with 120 hens and closing with 115. If the original flock had been kept throughout the year, the production per hen would have been only four eggs less. On the other hand the eggs per hen might have been greatly increased by more attention to culling.

Feed saving.

A high egg record in itself has no particular merit except for the results it may accomplish. As might be expected, the saving in feed was the big item. By culling each month in the year and keeping the flock at all times on a good producing basis Mr. Wirta saved nearly three hundred dollars on feed alone.

The mortality in this flock was only 5% of the original flock, probably also due to the fact that unpromising birds were removed as soon as noticed.

A similar low mortality occurred in the chicks. Out of 1500 chicks bought only 136 died, or 9% of the total. Six hundred twenty-five pullets were reared.

The ration used for both chicks and hens was the Ohio all mash ration. The cost was somewhat high, about \$2.64 per hen after deducting an average amount of \$.83 for each pullet reared.

This higher cost was to some extent due to the location in the northern part of the state where all feeds had to be purchased but was partly made up by a premium of four cents a dozen received for eggs.

Mortality and Winter Production

Winter production followed annual production closely as shown in the table below. In each group during the two years the highest mortality was found in the flocks where production was lowest.

	No. flocks	Eggs per hen		Mortality (% beginning hens)
		Annual	November-February	
1926-27	13	163	39	10%
	13	140	31	8%
	13	99	14	21%
1927-28	16	181	51	11%
	15	132	26	14%
	15	91	13	24%

The above table seems to indicate that disease and unhealthful conditions are principal causes

of a low egg yield, rather than that heavy laying necessarily increases mortality. In other words, the very care that helps to increase egg production tends to reduce mortality at the same time.

Annual and Winter Production

The question is often raised as to whether a high annual production may not be secured even though the winter egg yield is low. The following figures from the 1927-28 project lead one to conclude that the chances are against it.

No. flocks	Average eggs	Winter eggs			No. flocks above 50 eggs	No. flocks below 30 eggs
		Average	High	Low		
16 high	181	51	70	26	4	1
15 average	132	26	43	3	0	10
15 low	91	13	36	2	0	13

With 13 of the low producing flocks having an average winter production under 30 eggs per hen and only one of the high producing flocks in this class there seems good evidence that the winter production is one of the important elements in a high annual egg yield. In other words, the time lost by hens in winter is almost never made up at some later date. Principal causes of low winter production are, late maturity of pullets, inadequate housing and a poorly balanced ration.

Mortality and its Results

Losses were about average during both years, 13% in 1926-27, and 12% in 1927-28. Losses listed are from all causes, although principally from natural ones such as disease and accident. Last year's records show a definite relation between mortality and production and between mortality and net return.

Mortality, Production and Returns

	Mortality - Adult stock	
	<u>12% or less</u>	<u>Over 12%</u>
Total no. flocks	26	20
No. averaging 150 or more eggs per hen	12	4
No. averaging 100 or less eggs per hen	3	5
No. averaging \$2.54 or more net return per hen	12	2

According to these figures the chances are very much in favor of the flock in which losses are reduced to a minimum. Grouping the flocks as high, medium and low producing the relation is shown even more clearly.

Mortality in Hens

	<u>Hens</u>	<u>Eggs per hen</u>	<u>Net return per hen</u>	<u>Mortality</u>
<b>1926-27</b>				
13 high producing flocks	2920	163	\$2.36	10%
13 medium producing flocks	4011	140	1.77	8
13 low producing flocks	2277	99	.32	21
<b>1927-28</b>				
16 high producing flocks	6116	181	\$3.46	9%
15 medium producing flocks	3065	132	1.87	12
15 low producing flocks	2205	91	.80	18

With one exception lower mortality accompanied increased egg production. At least it indicates that a greater egg yield does not necessarily cause a heavier mortality. There is also a decided indication that a lowered return follows increased mortality.

Not only does the mortality reduce the production directly but it must also be borne in mind that conditions that bring about a high mortality are unfavorable to high production in the flock as a whole.

### Mortality in Chicks

Mortality in chicks showed a similar relation to production and to net return.

	<u>Eggs per hen</u>	<u>Net returns per hen</u>	<u>Mortality in chicks</u>
<b>1926-27</b>			
13 high producing flocks	163	\$2.36	11%
13 average producing flocks	140	1.77	34
13 low producing flocks	99	.32	36
<b>1927-28</b>			
16 high producing flocks	181	\$3.46	22%
15 average producing flocks	132	1.87	14
15 low producing flocks	91	.80	35

The low vigor, and lack of good care found in low producing flocks may be considered the chief causes of the high mortality in chicks. Similarly, the good care required to yield a high production is the best assurance of success in raising chicks without excess loss.

While occasionally a flock with a high chick mortality proves profitable, the following table shows that the chances are at least 2 to 1 in favor of the low mortality flock.

### Mortality in Chicks

	<u>20% or less</u>	<u>Over 20%</u>
No. flocks	24	20
No. averaging 150 eggs or more per hen	11	5
No. averaging 100 eggs or less per hen	1	7
No. averaging \$2.54 or more net returns per hen	10	4

The highest producing flock of all was in the low chick mortality group, and the lowest producing flock was in the high chick mortality group. This may be taken to indicate that good egg production does not necessarily cause the production of weak chicks. It especially emphasizes the fact that ability to raise a large percentage of the chicks hatched is one of the best assurances of a fair profit.

Mrs. John Hoffman of Goodhue county kept the mortality in her flock to the low point of 6% in hens and 7% in chicks. This low mortality coupled with a production of 156 eggs per hen in a flock of 186 R.C. Rhode Island Reds, gave her a net return of \$4.16 per hen. Two other flocks whose losses were 5% of the adult stock but over 40% of the chicks showed a net return only slightly over \$2.00 per bird in spite of egg records of 171 and 165 eggs per hen. Another flock in which the mortality amounted to 30% of the hens and 66% of the chicks made a return of \$3.21 per hen only because the stock brought high prices for breeding purposes, an advantage that cannot be counted on in the average farm flock.

### Costs of Feeding

Since feed costs are in most cases reported without specifying whether for hens or for chicks it

has not been easy to apportion the feed costs to the two groups. However, with the few chick records that have been available, and estimating the amount of feed a hen eats annually, a reasonably good estimate can be reached. With 70 - 75 pounds of feed used per hen each year, 30 to 35 pounds are left to be charged to the pullets reared. On this basis the feed cost per hen in 1926-27 was about \$1.56, while it cost about \$1.73 in 1927-28 to feed a hen the entire year. At this rate the feed cost for every pullet raised was about 70¢ in 1926-27 and about 83¢ the following year. The entire feed cost of rearing is thus charged to the pullets and no feed charge is made for broilers.

In this connection the records for the past two years showed that chick rearing is one of the money making phases of the business, not only replacing the flock with ready-to-lay pullets but also producing a nice profit on its own account. In 19 flocks the pullets reared exceeded the average number of hens kept. In 13 of these the net returns averaged over two dollars per hen. Only six of the nineteen fell below two dollars per hen in net profit. On the other hand in only nine flocks in which fewer pullets were raised than the average number of hens kept, did the return per hen reach \$2.00 or more, while in 18 such flocks it was less than \$2.00 per hen.

### Breeds and Production

The Leghorns made the highest egg records in both years, 139 per hen and 163 per hen in 1926-27 and 1927-28. Records in dual purpose flocks averaged 120 and 105 for the two years. In 1926-27 a third group, composed of 4 flocks of the Leghorns and dual purpose birds the production was 143 eggs per hen. With this advantage in total eggs laid the Leghorns were also ahead in winter eggs, 26% and 30% of their total eggs being laid from November 1 to March 1 in the two years, while the production of the dual purpose breeds in the same period averaged 20 and 19% of the total respectively.

#### Ten Highest Flocks - 1926-27

<u>Breed</u>	<u>Average hens</u>	<u>Average eggs per hen</u>
S. C. W. L.	193	214
Bl. Min.	121	169
R. C. R. I. R. & S. C. W. L.	350	169
S. C. W. L.	111	167
S. C. W. L.	507	166
S. C. W. L. Bd. R. & R. I. R.	139	165
White Wyand.	48	164
S. C. R. I. R.	164	163
S. C. W. L.	653	159
S. C. R. I. R.	60	154

#### Ten Highest Flocks - 1927-28

S. C. W. L.	388	229
S. C. W. L.	267	188
S. C. W. L.	757	187
S. C. W. L.	2072	185
S. C. W. L.	295	185
S. C. W. L.	191	183
Bd. Rock	117	172
S. C. W. L.	414	171
S. C. W. L.	85	170
S. C. W. L.	43	168



Breed and Net Return

The effect of breed on net returns is less clearly shown. In the first year the profit was \$1.79 per hen in the Leghorn group and \$1.66 per hen among the dual purpose breeds, too small a difference to be significant. The same relation was not shown in 1927-28 when the Leghorn flocks showed a net return of \$2.83 per hen and the dual purpose flocks only \$1.40 per hen. This wide difference may be partly explained by the fact that all of the flocks of commercial proportions, of 500 or more hens, were Leghorns. Leaving out of consideration these eight commercial flocks, and considering only farm flocks, the net return in the Leghorn group in that year was \$1.93 per hen as against \$1.40 per hen among the dual purpose flocks.

Sources of Returns

With this lower average production on the part of the dual purpose breeds it is evident that some other source of income is necessary if dual purpose breeds are to compete with the light breeds in profit making. Not only were the total cash receipts larger in the Leghorn flocks but also the percentage contributed by eggs was considerably larger, 79% in 1926-27 and 75% the following year. The proportion of the total cash receipts from eggs in the dual purpose breeds in the same two years was 54% and 61% respectively. The share contributed by sales of poultry in these flocks was then, in 1926-27, nearly half the total cash receipts.

On the average, however, even in the dual purpose breeds, the amount received from poultry was not sufficient to pay the cost of feed although nearly half the dual purpose flocks in 1926-27 and five out of 17 of the 1927-28 flocks succeeded in keeping the feed costs lower than the amount received for meat. In only three cases in the two years was this accomplished in Leghorn flocks. On the other hand the average receipts from eggs in both years exceeded the amount paid for feed. In the Leghorn flocks in 1927-28 the eggs contributed enough so that even if there had been no income from the sales of poultry there would still have been a net return of about a dollar per hen.

This leads to the conclusion that in Minnesota where the sale of poultry rarely brings large premiums the egg income must be counted on as the chief source of profit and that flock owners cannot afford to sacrifice egg production and still hope for a profit.

Egg Production and Feed Cost

A question that is always worth considering is to what extent increased egg production causes an increase in the cost of feeding and whether such an increase in cost is justified.

Records for both years indicate that higher feed costs accompany higher egg production. However, a definite increase in money made also follows the rise in feed costs, as indicated by the following table.

	<u>Egg Production per hen</u>	<u>Feed cost per hen</u>	<u>Net return per hen</u>
1926-27			
13 low producing flocks	99	\$1.88	\$ .32
13 medium producing flocks	140	1.90	1.77
13 high producing flocks	163	2.50	2.36
1927-28			
15 low producing flocks	91	\$2.00	\$ .80
15 medium producing flocks	132	2.48	1.87
16 high producing flocks	181	3.21	3.46

Profitable to Purchase Supplements

With home grown feeds available at a considerably lower cost than feeds purchased, the opinion

is frequently expressed that it is not wise to purchase the supplements needed to balance the home grown feeds. This is best answered by the fact that in the eight commercial flocks practically all feeds were purchased, and in these flocks the net return per hen ranged from \$2.00 to \$6.59 per hen, five of the eight flocks averaging over \$3.00 per hen. Information is not available in all cases as to the extent to which the feeds were home grown. However, a survey of all flocks in which the net return exceeded \$2.00 per hen shows that twelve of the twenty-two are located outside the usual grain producing sections and so probably purchased most of their feeds, whereas in the twenty-four flocks with returns of less than \$2.00 per hen only ten were located in these sections. A still further indication may be had from the quantity of mash fed in the high and the low return groups, since mash, or at least a portion of it, is purchased more commonly than the scratch feeds. In 1926-27 the high return flocks averaging \$2.59 net return per hen received an average of 46 pounds of grain and 40 pounds of mash per hen, or nearly equal amounts by weight. In the low return flocks, averaging \$ .65 net return per hen the scratch grain fed averaged 55 pounds and the mash 37 pounds per hen. The following year a greater consumption of mash was noticed in all flocks but the low return group still used less mash than scratch feed. In these flocks, with an average net return of \$1.36 per hen the scratch amounted to 58 pounds and the mash 42 pounds per hen. In the high return group, returns averaging \$4.08 per hen, the scratch consumed was 53 pounds and the mash 70 pounds per hen leaving out of consideration one flock which had an all mash ration. The poultryman may well ask himself whether in the light of these results he can afford to feed poultry at all without supplying all of the necessary elements.

### Cod Liver Oil

The use of cod liver oil during the winter months is still new enough to raise a question as to its effect. So far no very definite data from the record flocks is available. However, some observations made may be considered significant. In 1927 a survey of the record flock cooperators showed ten of them using cod liver oil in the winter laying ration. Nine of these reported a definite improvement in quality of shells, reduction in egg eating and laying paralysis and in one case an immediate increase in egg production.

The following year, in the 1927-28 project, 19 flocks received cod liver oil. The records show that over half of the flocks making the highest net return were fed cod liver oil, while it was given to only one third of those in the low return group. In the three groups classified as to egg production it was noticeable that more cod liver oil was used in the high producing flocks. It was fed to 11 of the 16 highest production flocks, 6 of the 15 average production flocks, and only 2 of the 15 in the low production group. This does not prove that cod liver oil is a sure means of increasing the egg yield but it does show that the feeding of it is a practice that is accepted by successful poultrymen.

### Size of Flock

Of the 46 flocks reporting, eight may be considered as of commercial size, having started the year with over 500 hens. The average size of these flocks for the year ranged from 388 to 2072 hens. When all the flocks are grouped according to size there seems to be a definite advantage on the side of the commercial flock.

	<u>No. flocks</u>	<u>Eggs per hen</u>	<u>Net return per hen</u>
500 or more hens	8	171	\$3.42
200 to 499 hens	21	128	1.47
Under 200 hens	17	124	2.24

Seven out of the eight commercial flocks had a net return of over \$2.00 per hen and four of them made over \$3.00 per hen. The production in these flocks ranged from 116 to 229 eggs per hen three flocks falling below 150 eggs per hen. There was much greater variation in both egg production and net return in the flocks of less than 500 hens, some of them proving very profitable and others being

kept at an actual loss. This may be taken to indicate that the very importance of the commercial flock is the best assurance of its success, and that good care and management will bring results in any size of flock.

Poultry Raising as an Investment

There was a decided variation among the 46 flocks in the amount of money invested in stock, buildings and equipment, running as low as \$2.10 and as high as \$13.71 per hen. This great difference was due partly to an actual difference in the value of the business as inventoried and partly to a difference in the basis used in estimating the value. In nearly all cases where the investment was charged at less than three dollars per pen, the charge for buildings was little or nothing. In most flocks the hens were valued at about one dollar each. In the flock with an investment of \$13.71 per hen, the hens themselves were inventoried at two dollars each. The net return varied from \$1.38 on each dollar invested in stock, buildings and equipment to a loss of seven cents for every dollar so invested. The average net return was \$.47 per dollar invested. Only eight of the forty-six flocks showed a return of less than 10¢ per dollar of investment. It will be noticed that the investment does not include payments throughout the year for feed, equipment and the like. However, this apparent reduction in size of investment is balanced by the fact that returns are also spread out over the entire year rather than withheld until the end of the year.

There was a noticeable correlation between the net return on the investment and the net return per hen. That is, all of the 21 flocks whose net return per dollar invested was 35¢, or less, showed also a net return per hen of less than two dollars. Also, of the 25 flocks in which return on the dollar was over 35¢, only three had a return per hen of less than two dollars.

<u>Net return per dollar invested</u>	<u>No. flocks</u>	<u>Return per hen</u>	
		<u>Highest</u>	<u>Lowest</u>
Over \$.35	25	\$6.59	\$1.68
\$.35 or less	21	1.90	-.30

On the other hand there was practically no correlation between the amount of the investment and returns made. Some of the largest investments per hen were accompanied by the highest returns, and by the lowest returns as well. The same thing can be said of the low investments. These figures tend to show that good management is far more important than the actual amount of the investment. There is, however, a slight tendency for the successful poultrymen to feel justified in increasing the investment, while the less successful ones do not believe it profitable to do so.

The Outlook for Poultry Raising

Returns for the past two years are encouraging for farm poultry raising and to a somewhat more limited extent for the commercial flock. The following summary of results for the past six years shows no sign of any trend toward lower profit making.

<u>Year</u>	<u>No. flocks</u>	<u>No. hens</u>	<u>Average size flocks</u>	<u>Eggs per hen</u>	<u>Net return per hen</u>	<u>Av. price per dozen eggs</u>	<u>% eggs laid Nov. -Feb.</u>
1922-23	19	3643	191	102	\$1.68	\$.24	13
1923-24	14	2096	149	120	2.10	.27	16
1924-25	31	6096	196	128	2.53	.34	21
1925-26	29	5440	186	124	2.25	.32	27
1926-27	39	9208	236	137	1.61	.27	25
1927-28	46	11386	247	150	2.54	.34	29

Total net incomes, after all expenses except labor were considered, ran as high as \$6700 in a flock of 2072 hens. Net incomes ran over \$500 in fifteen of the flocks. Only two flocks showed a loss at the end of the year, both being mixed flocks. Poorly balanced rations were characteristic of both these flocks.

### Summary and Conclusions

1. High egg production brought increased profits.
2. A high winter production is essential to a high annual egg yield.
3. A high egg yield does not necessarily increase the mortality.
4. High mortality is one factor in low net returns.
5. Feed costs increased with increased egg production, but returns were enough greater to make it profitable to feed for a high production.
6. Chick rearing may add to the profit as well as replace the old stock.
7. The Leghorns led in egg production and held a slight lead over the dual purpose breeds in net returns during both years.
8. In Minnesota the chief source of poultry income is the eggs produced.
9. Feeding cod liver oil is a well established practice among successful poultrymen.
10. Commercial flocks had a definite advantage in both egg yield and net returns.
11. Poultry raising represents a sound investment, at least for farm flock owners.

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