DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE
DOMINION EXPERIMENTAL FARMS

POULTRY DIVISION

REPORT OF THE DOMINION POULTRY HUSBANDMAN

F. C. ELFORD

FOR THE YEAR 1924

Cockerels in the corn field.

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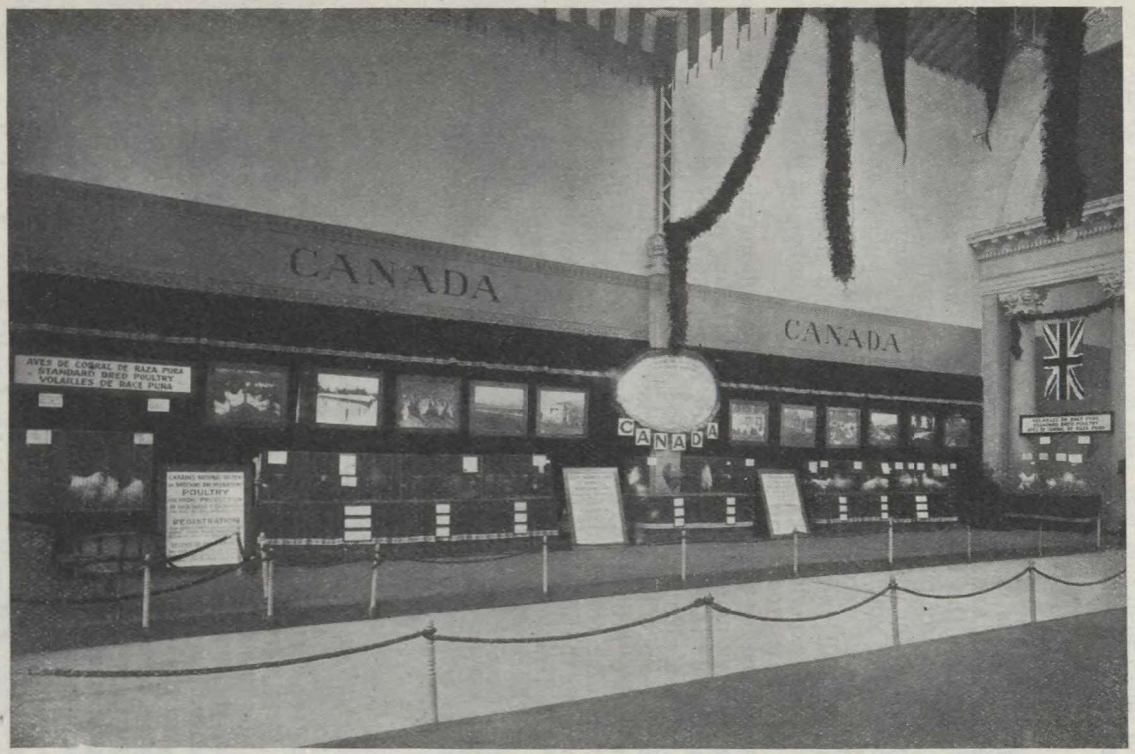


THE BARCELONA EXHIBIT

Photograph of Canada's exhibit at the World's Poultry Congress. The exhibit was constructed for a 30-foot square space, but had to be flattened to a 50-foot wall. At the two ends are the four pens of Standard-bred birds; the centre space shows the Registered and R.O.P. pens, represented by both varieties, Barred Rocks and White Leghorns. The eleven large photographs are pictures of Canadian birds and poultry plants. The map shows the distribution of poultry in Canada. The three large placards in French, English and Spanish, give a very brief explanation of Registration and R.O.P. The Barred Rock pen at the extreme left was the pen presented to His Majesty King George V, and the White Leghorn pen at the extreme right was the pen presented to His Majesty King Alfonso of Spain.

POULTRY DIVISION

Report of the Dominion Poultry Husbandman, F. C. Elford

GENERAL CONDITIONS

Production conditions in Canada this past year, on the whole, have been good. A somewhat cold and backward spring interfered with the hatching of early stock, and this at the time that feed prices were going up, means that there may not be as many pullets in winter quarters this year as usual. Still, the season throughout the later spring, summer and early fall was favourable and the growth of the young stock good, the early pullets and some of the well-matured later ones were in good laying condition and eggs were fairly plentiful during the fall and early winter. The cold snap in December, the coldest that has been experienced for years, put a damper on production, and the end of the year saw production very low.

The prices received for eggs during the year have been fairly good; in some of the outlying country points they went down to a low point and were somewhat discouraging, but these prices did not remain long. It is reported that wholesalers have been able to sell at a good price, and that money was made in the handling of eggs. Poultry meat has been about the same in price as last year, turkey prices a little higher, and turkeys possibly not as good a crop. The increase in feeding costs throughout most of the year, and the falling off of production during the high prices this fall, has cut down the revenue of the producers and considerable complaint has been received as to the returns during the later part of December and Christmas holidays. Should this condition prevail for the next two months it will be hard for the winter producers of new-laid eggs.

WORK OF THE DIVISION

CENTRAL FARM

At the Central Farm no chicks were reared on the home plant. Various sections of the farm were used for this purpose, the pasture, and the corn field, and later the rifle range (15 miles distant in the country) were each used at intervals during the summer. Though it meant considerable moving around and inconvenience, the result in the fall was a very good lot of healthy, well-grown pullets and cockerels.

The cockerels were kept in the corn field (see frontispiece) for the whole summer. A better growth has not been secured at any time on this plant. They were in prime condition; the land was new; they had no disease or parasites, and came into winter quarters the best bunch of cockerels we have ever had.

A new type of rearing house was used this summer for some of the young stock (a picture of one of them is seen in the frontispiece). It is built in sections so that it can be moved "knocked down." It is 12 feet square, without floor, and the sides are wire only. The whole space is taken up with roosts, placed 3 feet above ground, even with the eves. It has proven very satisfactory so far, gives an abundance of fresh air with no apparent draughts, and has the advantages that it can be locked up at will, is comparatively cheap in construction and easy to move.

A much needed change was made in the central plant. Most of the land used for the permanent yards has been so used for nearly forty years, and it's condition is not the most conducive to health in the flock. The trouble indeed was so great that to keep the smaller yards free from disease, the cleaning out of all these, even to the breeding yards, was decided upon. One portion of the plant was so treated this year, and next year it is hoped that all the permanent houses upon the central plant will have double yards available.

BRANCH FARMS

The same idea is being introduced on the branch Farms; that is, to provide the double yard accommodation for all permanent houses, and the rearing of the young stock entirely off the permanent plant. On some of the older branch Farms, trouble from contaminated land was making its appearance, or rather the difficulty of keeping the yards clean was emphasized more each year. Therefore, the policy of having two yards for each permanent house is being adopted. It is expected that with a strict adherence to this policy we will be able to overcome, or to prevent in most cases, the same trouble that a good many other poultrymen in Canada are experiencing at the present time—worms and other diseases of the poultry flock.

THE WORLD'S POULTRY CONGRESS

Canada participated in the Second World's Poultry Congress which was held at Barcelona, Spain, in May, 1924. As this division was given the responsibility of preparing the exhibit and the Dominion Poultry Husbandman accompanied the exhibit as one of Canada's official delegates it seems proper to include a brief report of the exhibit and Congress in the annual report of this division. Mr. E. Rhoades, of the Live Stock Branch, who was at Wembley for the department, also attended the Congress officially from Canada.

A very creditable and attractive exhibit was prepared and set up at Barcelona that did much to advertise the excellence of Canada's poultry. The exhibit had for its central idea the governmental encouragement of pedigree breeding. It included 34 birds, 14 of which represented the registered class, 8 the record of performance class, and in addition, 11 birds represented the standard-bred class.

The pedigreed birds included an equal number of Barred Plymouth Rocks and White Leghorns. The registered class had a pen in each breed of first generation birds, and a pen of second generation birds. The R.O.P. birds were one pen of each breed. The standard-bred birds were a trio each of Barred Plymouth Rocks, White Wyandottes, White Leghorns, and a pair of Chantecler.

In determining the breeds to be represented in the standard-bred exhibit, six of the most popular breeds were first selected, and a letter written to the secretaries of the breed associations, asking them if they would contribute a trio and be responsible for the selection of birds such as they would be willing to have represent the breed in the Canadian exhibit. Unfortunately only two of the breed associations replied in time, the Barred Plymouth Rock and the Chantecler. (The White Wyandotte Association replied, but after the time set.) It was necessary, therefore, to take the matter up with private breeders, a number of whom would not consider the question, so that the number of breeds was reduced to four, the Barred Rocks coming through the association, the Chantecler coming through the founder of the breed, and the White Leghorns and White Wyandottes coming from private breeders.

These breeders who were good enough to give the birds of these four breeds, were: the Wyandottes, Hon. John S. Martin, Port Dover, Ont.; the Barred Rocks, Co-Pew-Haw Poultry Farm, Toronto, Ont., and Dr. J. A. Lambertus, Eganville, Ont.; the White Leghorns, Ferguson & Hunter, Smith Falls, Ont.; and the Chanteclers, the originator, Rev. Bro. Wilfrid, Agricultural College, La Trappe, Que.

The pedigreed birds that did not come from the Experimental Farms at Ottawa and Agassiz were donated by the following breeders: The Norfolk Specialty Farms, St. Williams, Ont.; J. W. Clark, Cainsville, Ont.; Col. T. G. Delamere, Stratford, Ont.; B. J. Penhall, Port Dover, Ont.; W. N. Hendrick, Hanover, Ont.; C. J. Spratt, Alberni, B.C.; and the University of British Columbia.

In addition to the birds, the exhibit included enlarged photographs of poultry plants and flocks, information upon charts, large and small, as to what Registration and Record of Performance meant, and there was also a small pamphlet giving this information in more detail. All printed information was given in three languages, English, French, and Spanish. The arrangement of the exhibit was made for a 30-foot square space, with electric lighting, so as to direct attention to the registered cockerels which were to be placed immediately under a map of Canada. This map showed by coloured pins of different sizes the poultry population in the various provinces, and the distribution of the Registered and Record of Performance flocks.

The outstanding features of Canada's very attractive exhibit, and those that caused the most comment at the Congress were, the constitutional vigour of all Canadian birds, the advanced government work that the pedigreed birds represented, and the general excellence of those that represented the standard breeds.

Good prices were offered for the birds, but it had been decided that none would be sold but rather presented to those to whom they would be of the most service. It was also decided to take most of them to England where they would be exhibited in the British Poultry Club exhibit at Wembley.

As noted, the birds were all left in Spain or in Great Britain, and the names of the recipients are of interest: Trio of Barred Plymouth Rocks to His Majesty King George; trio White Leghorns to His Majesty King Alfonso; a pen of R.O.P. White Leghorns to the Royal Spanish Poultry School, Barcelona; a pair of R.O.P. White Leghorn hens to the British Consul General, Barcelona; the Chanteclers to the Monastry of St. Isidore, Spain; a pen of registered Barred Rocks to Harper Adams Agricultural College, England, the standard-bred White Wyandottes to the British National Poultry Club, England; a pen of Registered White Leghorns to the Board of Agriculture for Scotland; and a pen of R.O.P. Barred Rocks to the Board of Agriculture for Ireland.

It also is of interest to note that the Congress Council decided to hold the next session of the World's Poultry Congress (1927) in Canada. It is expected that it will take place in Ottawa, probably in the month of August.

Sections of this report have been prepared by the members of the staff in charge of the work reported on, as follows: Breeding by Geo. Robertson; contests and registration, A. G. Taylor; field work in Quebec and experimental work oversight, W. W. Lee; inspection, W. T. Scott; and the work on poultry diseases, by Dr. C. H. Weaver.

BREEDING

The breeding work is progressing favourably. At the Central Farm two breeds only are kept for general work; on the branch Farms, where formerly more than one breed was kept, a gradual elimination has been taking place so that each Farm may eventually keep only the one breed. The reason for this is that more satisfactory work can be accomplished with a single variety than where effort is spread over a number of breeds or varieties.

The following is a list of all the Farms and Stations upon which poultry is kept, and the breeds or varieties they will breed this coming season.

LIST OF FARMS AND BREED OR BREEDS KEPT

Central Experimental Farm, Ottawa.—Barred Plymouth Rocks and Single Comb White Leghorns.
Experimental Station, Sidney, B.C.—White Wyandottes.
Experimental Farm, Agassiz, B.C.—Barred Plymouth Rocks.
Experimental Station, Summerland, B.C.—White Wyandottes.
Experimental Station, Invermere, B.C.—Single Comb White Leghorns.
Experimental Station, Lethbridge, Alta.—Barred Plymouth Rocks.
Experimental Station, Lacombe, Alta.—White Wyandottes and Barred Plymouth Rocks.
Experimental Station.—Swift Current, Sask.—Barred Plymouth Rocks.
Experimental Station, Scott, Sask.—Barred Plymouth Rocks.
Experimental Station, Rosthern, Sask.—Barred Plymouth Rocks.
Experimental Farm, Indian Head, Sask.—White Wyandottes.
Experimental Farm, Brandon, Man.—Barred Plymouth Rocks.
Experimental Station, Morden, Man.—Single Comb Rhode Island Reds and Barred Plymouth Rocks.
Experimental Station, Kapuskasing, Ont.—Barred Plymouth Rocks.
Experimental Station, La Ferme, Que.—Barred Plymouth Rocks.
Experimental Station, Lennoxville, Que.—Barred Plymouth Rocks.
Experimental Station, Cap Rouge, Que.—Barred Plymouth Rocks.
Experimental Station, Ste. Anne de la Pocatiere, Que.—Barred Plymouth Rocks.
Experimental Station, Fredericton, N.B.—Barred Plymouth Rocks.
Experimental Farm, Nappan, N.S.—Barred Plymouth Rocks.
Experimental Station, Kentville, N.S.—Barred Plymouth Rocks and Single Comb White Leghorns.
Experimental Station, Charlottetown, P.E.I.—Barred Plymouth Rocks and Single Comb White Leghorns.

HIGH INDIVIDUALS

High production lines are becoming better established and more attention is gradually being paid to breeding for standard qualifications. Exceptionally high production as shown by Contest reports has been recorded at two of the Farms as follows: Nappan, bird No. 210 laid 313 eggs that averaged 24 ounces to the dozen. Lethbridge, bird No. 300 laid 305 eggs that averaged 24 ounces to the dozen. Some of the other Farms made good records, but these were the only two Experimental Farm birds that laid over 300 eggs in a Contest.

THE CENTRAL PLANT

At the Central Farm, where for some years quarters have been cramped, and there has been insufficient rearing ground, conditions have been greatly improved.

The young stock was reared entirely apart from the poultry plant—the breeding cockerels in a cornfield on which no poultry had previously been ranged, and the pullets a distance from the Farm, on the Dominion Rifle Range, which was also new ground so far as poultry range was concerned. The results were just what were to be expected. The flock was put into winter quarters in very much better condition as to general health and growth than has been the case for many years.

A new location has been found for the Laying Contests, so that the ground which had formerly been used in connection with the breeding work and which for the past four years had been occupied by the Contests is now again available for breeding and rearing work. Added to this, the fact that a new breeding house has been built, makes conditions for work much more satisfactory than they have been for a number of years.

One hundred Barred Rock cockerels and one hundred White Leghorn cockerels from high production lines have been reserved as breeding cockerels for the improvement of farm flocks. These cockerels for which a nominal charge is made, are in demand and are being sent out daily so long as the supply lasts.

In waterfowl breeding, operations have been extended, the season being devoted to the growing of foundation flocks for future use. The stock now consists of Toulouse, African, China and Canada geese and Pekin, Rouen, Indian Runner, White Muscovy, Black Muscovy and Cayuga ducks, so that more extensive breed tests and experimental work will be possible in the future.

DURATION OF FERTILITY

In 1914 an experiment was conducted at this Farm (see Report of Dominion Poultry Husbandman for 1915) to show the duration of fertility after the removal of the male bird. That experiment showed that fertility showed as long as eighteen days after the removal of the male, and in all our breeding work, practice has been based upon this assumption.

Since the mating of the birds that qualified for registration began, there has been a demand for further knowledge as to just how long it was necessary to wait after the replacement of a male bird before accurate results could be secured.

To determine this, an experiment was conducted in which a White Leghorn male was mated to ten Barred Rock females. These females up to date of changing the males had been mated with a vigorous Barred Rock cock bird and the fertility had been running about 78 per cent.

A Leghorn-Rock cross produces a white chick so that the effect of introducing the Leghorn male was readily apparent. Table 1 shows in detail the results of eggs set following the change of males.

TABLE 1—DURATION AND CHANGE OF FERTILITY

Days after change of males	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
731	R	R	.	R	.	W	W	W	W	.	W	W	W	W	W	.	W	W	W	W	.	W	W	W	W	W	W	W	W	I	W	.	I	W	W	W
732	R	R	R	I	W	R	.	W	W	.	I	W	.	.	W	.	W	W	W	.	W	W	.	.	W	W	W	W	I	W	W	W	W	W	W	W
733	R	I	R	.	R	.	.	R	W	.	.	W	I	.	.	.	W	I	.	.	I	.	I	W	.	W	W	.	.	.	W	W	W	.	W	.
734	.	R	R	R	W	R	W	R	W	.	W	D	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	W	W	W	.	W	W
735	R	R	.	R	W	.	I	.	I	.	.	I	W	W	.	W	.	I	W	W	W	.	.	W	W	W	W	W	.	W	W	W	.	W	W	.
736	.	.	.	.	.	.	.	.	.	.	.	.	W	W	W	.	W	W	W	.	W	W	.	W	W	W	.	.	.	W	.	W	W	W	W	W
737	R	R	R	W	.	.	.	.	W	.	.	.	W	W	W	.	.	W	W	W	W	W	.	W	.	.	W	W	.	.	W	W	.	.	.	W
738	.	.	I	.	R	I	I	I	I	.	I	W	.	.	.	.	W	.	I	.	.	.	.	.	.	.	.	.	.	I	I	I	.	W	.	.
739	R	.	.	.	.	.	.	R	W	.	.	W	.	W	.	W	.	.	W	W	W	W	.	W	W	.	W	W	W	W	.	.	.	.	.	.
740	.	I	.	R	W	W	R	I	W	.	.	W	W	W	W	W	W	I	.	W	W	W	W	W	.	.	W	W	.	W	W	W	W	W	W	W

Key to table—R indicates a Rock chick, the result of the original mating. W represents a crossbred chick resulting from the introduction of the Leghorn male. I Indicates an infertile egg. A blank indicates that no egg was set that day.

It will be noted that no results of the previous mating are apparent after seven days.

Definite conclusions cannot be drawn from the experiment as there are so many factors which may effect results, but it is interesting to note that in this case no results of the previous mating were apparent beyond seven days after mating, whereas, in the experiment previously mentioned, " Decrease of fertility after the removal of the male ", fertility showed 100 per cent strong in the case of a Leghorn pen the tenth day after the removal of the male, and up to the eighteenth day fertility showed in the case of a pen of Barred Rocks.

This would suggest that the fertility of the first mating was affected by the introduction of the second male.

The question naturally arises, to what extent would results be affected by varying degrees of virility of different males. Work along this line will be continued and the information gained published in later reports.

The problem of small eggs is becoming more and more pronounced, the longer the breeding for high egg production is continued. The necessity for breeding for increased size of egg becomes readily apparent as the production is increased.

Attention has been given to this phase of the work for a number of years, but with the advent of registration it has been more forcibly brought to the attention then heretofore. A bird that does not lay eggs that average 24 ounces to the dozen cannot be registered, no matter how many eggs she lays.

Our records do not show that because a hen lays a large number of eggs she must necessarily lay a small egg, but they do show that unless careful selection is followed there is a decided tendency for the size of eggs to decrease as production increases.

When breeding for increased production, even from birds that show a number of generations of large-egg birds back of them, there is a constant cropping out of individuals that lay small eggs. These birds should be discarded, as although they may produce daughters, the larger number of which will lay normal sized eggs, the tendency to a greater number of birds laying small eggs is increased.

The importance of using the greatest care in selecting a male to head a flock to see that he is from large-egg stock cannot well be overestimated.

Data are being gradually accumulated along these lines and will be given out in due season.

EXPERIMENTAL WORK

It is the endeavour to keep the experimental work along the lines that are of most interest to the practical poultryman, hence the feeding of chicks and layers and similar experiments come in for a large share of attention. The disease investigations also are becoming more important each year.

This year's report deals with the continuation of experiments that have been under way for more or less time. When sufficient data have been collected upon any experiment to justify conclusions being drawn such an experiment will be discontinued.

All branch Farms are co-operating with the Central Farm in conducting many of these experiments (where there is a special local condition the branch Farms conduct individual experiments), which give an amount of data difficult to obtain except in co-operation work of this nature.

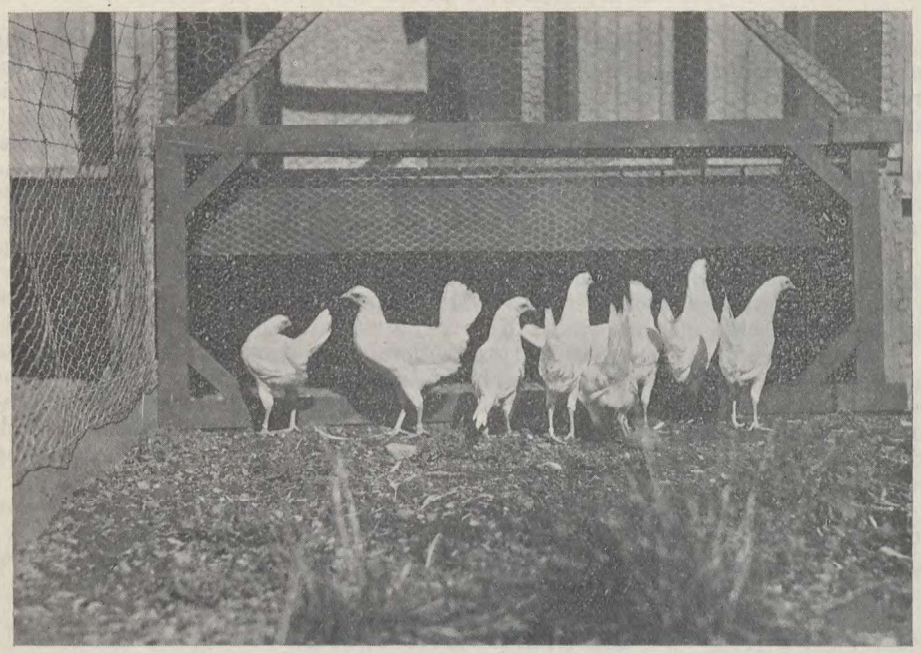
In the yearly report of experimental work it must be borne in mind by the reader that the annual report is in most cases a report of progress. When the experiment is finished the report of that individual experiment may be considered final, and then only should conclusions be drawn.

VITAMINE FEEDS FOR BROODER CHICKS

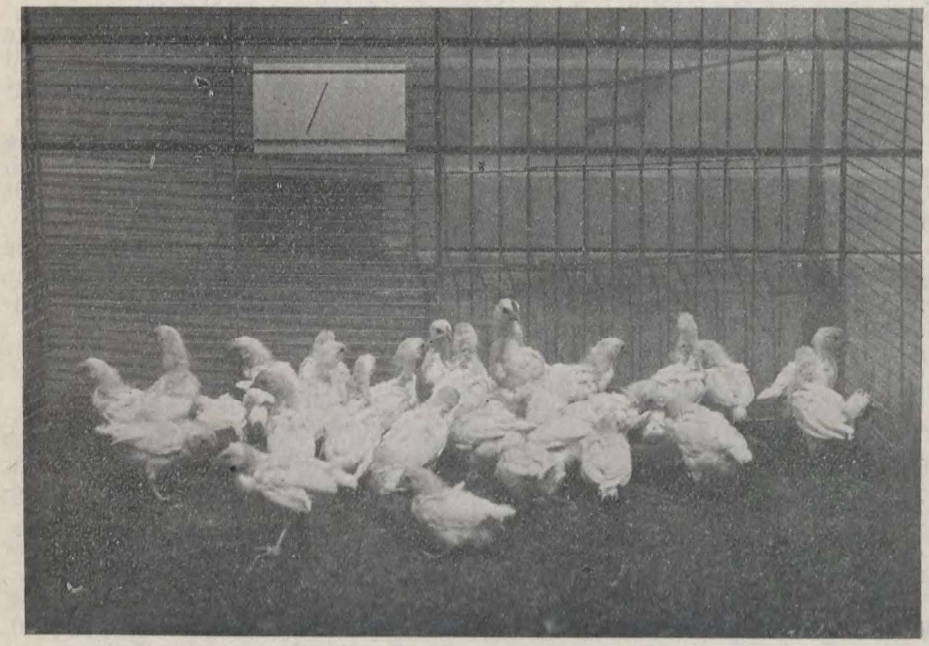
During 1923, a series of experiments was conducted to compare the value of various feeds for chicks, with special reference to their vitamine content, details of which were given in the annual report of the Dominion Poultry Husbandman for that year.

This year further experiments were undertaken, varied somewhat in their procedure from those of last year, but having the same objective.

STOCK AND HOUSING.—The stock used for the experiment consisted of White Leghorn Chicks, hatched in the Mammoth Buckeye incubator on May 30, and housed in the pipe brooder house. During the three weeks of the experiments the chicks were kept confined entirely.



Pen No. 1. Vitamine feeds on range.



Pen. No. 1. Vitamine feeds for brooder chicks.

When taken from the incubator, the seven hundred chicks were divided into fourteen lots of fifty each, and put on the special feeds immediately. Four days later, forty of the best in each lot were chosen for the experiments, this being done to make a fair allowance for incubator mortality.

ARRANGEMENT OF PENS AND FEEDS.—All the chicks, except those in pen 9, received a basal ration consisting of standard chick scratch (fed by hand), standard mash (dry, constantly before them in hoppers, and fed moistened once a day) composed of equal parts by weight of bran, middlings, corn-meal, and oat flour, with half a part of beefmeal; grit; greens; and both milk and water to drink.

The special feeds were given as indicated in the following arrangement of pens:—

Pen 1. (Control).—Basal ration.

Pen 2. Wheat germ.—One-half part added in the mash.

Pen 3. Rice polish.—One half part added in the mash.

Pen 4. Larro yeast.—One ounce added to ten pounds of mash.

Pen 5. Fleischmann's yeast.—One ounce added to ten pounds of mash.

Pen 6. Tomato pulp. One ounce per day given in the wet mash.

Pen 7. Cod liver oil.—One and a half tablespoonfuls per day, per pen, given in the wet mash.

Pen 8. Raw liver.—Two ounces per day, chopped finely and given in the wet mash, which contained no beef meal.

Pen 9. Ful-O-Pep, growing mash.—Fed in place of standard mash with rest of basal ration.

Pen 10. Cod liver oil and raw liver.—Fed as in pens 7 and 8.

Pen 11. Cod liver oil and Larro yeast.—Fed as in pens 4 and 7.

Pen 12. Cod liver oil and Fleischmann's yeast.—Fed as in pens 5 and 7.

Pen 13. Cod liver oil and wheat germ.—Fed as in pens 2 and 7.

Pen 14. Cod liver oil and rice polish.—Fed as in pens 3 and 7.

All the chicks were weighed daily, the mortality noted, and weight of dead chicks recorded. At the end of each week they were classified for condition according to their general appearance. This is denoted in the table by the following letters:—E (excellent); V.G. (very good); G. (good); V.F. (very fair); F. (fair); P. (poor), and V.P. (very poor).

Table 2 shows the average weight per chick at the beginning of the experiment and at the end of each week, the mortality from week to week, the condition of the chicks each week as judged by their appearance, the average actual and percentage gain per chick, and the average cost of feed per chick for the three-week period.

INFERENCES:—While it is yet too early to draw any definite conclusions, it would seem safe to infer that the addition of certain feeds such as cod liver oil, raw liver, and yeast to the ration for brooder chicks, has beneficial effects from the standpoint of development, lowering mortality and preventing leg weakness. Further work must be undertaken, however, before any positive statement can be made regarding the relative value of these feeds.

TABLE 2.—DETAIL—VITAMINE FEEDS FOR BROODER CHICKS

Pen	Special Feed	Number of chicks at beginning	Average weight at beginning	Number of chicks end of first week	Average weight end of first week	Condition end of first week	Number of chicks end of second week	Average weight end of second week	Condition end of second week	Number of chicks at end	Average weight at end	Condition at end	Total mortality	Average gain per chick	Average per cent gain per chick	Average cost of feed per chick alive at end
			oz.		oz.			oz.			oz.		oz.	%	c.	c.
1	Basal ration	40	1·3	35	1·94	E.	35	3·14	V.G.	34	4·94	G.	6	3·64	280	1·8
2	Wheat germ	40	1·32	39	2·08	E.	39	3·1	E.	38	4·45	V.G.	2	3·13	237	1·7
3	Rice polish	40	1·32	39	1·97	G.	38	3·0	V.G.	38	4·24	G.	2	2·92	221	1·6
4	Larro yeast	40	1·37	40	2·07	G.	40	3·2	V.G.	40	4·45	V.G.	.....	3·08	225	1·9
5	Fleischmann's yeast	40	1·32	39	2·05	V.F.	38	3·21	V.G.	37	4·68	G.	3	3·36	254	2·1
6	Tomato pulp	40	1·35	38	1·97	V.G.	37	3·14	V.G.	37	4·43	F.	3	3·08	228	1·9
7	Cod liver oil	40	1·37	39	2·13	V.F.	39	3·41	V.G.	39	5·15	V.G.	1	3·76	274	2·3
8	Raw liver	40	1·3	38	2·03	V.G.	38	3·29	G.	38	4·76	V.F.	2	3·46	266	1·8
9	Ful-O-Pep mash	40	1·25	38	1·79	G.	37	2·97	V.F.	37	4·89	G.	3	3·64	291	3·1
10	Cod liver oil and raw liver	40	1·22	36	1·72	F.	36	2·97	G.	36	5·06	V.F.	4	3·84	315	2·7
11	Cod liver oil and Larro yeast	40	1·3	39	1·87	F.	39	3·05	V.F.	39	4·62	F.	1	3·32	255	2·5
12	Cod liver oil and Fleischmann yeast	40	1·27	38	1·82	F.	38	2·76	V.F.	38	4·26	G.	2	2·99	235	2·7
13	Cod liver oil and wheat germ	40	1·25	36	1·86	V.F.	36	2·67	V.F.	36	4·53	V.F.	4	3·28	262	2·2
14	Cod liver oil and rice polish	40	1·25	33	1·67	P.	32	2·78	P.	32	3·81	V.P.	8	2·56	205	2·3

REMARKS.—The highest percentage gains and greatest actual gains were made by the chicks receiving both cod liver oil and raw liver, being followed closely by those receiving Ful-O-Pep mash, the basal ration, cod liver oil, and raw liver respectively.

The lowest mortality was recorded among the chicks fed Larro Yeast, as there were no deaths. Both cod liver and cod liver oil with Larro yeast gave low mortality figures, there being only one death in each pen.

The chicks fed on cod liver oil with rice polish showed the highest mortality, (eight deaths) followed by six in the control pen fed the basal ration and four in the pen receiving cod liver oil with raw liver.

The chicks receiving tomato pulp began to suffer from leg weakness on the fifteenth day and at the end of the experiment three were completely down, with all the others showing evidence of the trouble. One chick in the Larro yeast pen also went down on the fourteenth day and a few others showed slight stiffness at the end of the period.

On the twenty-first day several chicks in all the pens except those in which cod liver oil was fed, were beginning to show preliminary signs of leg weakness.

Cannibalism started on the twentieth day among the chicks receiving cod liver oil with raw liver.

Graphs were prepared, which bring out more clearly the results obtained from day to day. These may be seen at the Poultry Division offices.

VITAMINE FEEDS FOR REARING

This experiment was a continuation of the one of which details have been given in preceding pages under the title " Vitamine Feeds for Brooder Chicks". Owing to lack of sufficient housing accomodation it was impossible to continue the fourteens pens which were used in this last-mentioned experiment. Consequently, at the end of the brooding period (that is at three weeks of age) twenty-five chicks from each of seven pens were transferred to the Experiment House and kept there during the rearing stage.

During this period they received exactly the same special feeds as had been given in the brooder experiment, the only difference being that where necessary the proportions were increased according to the age of the chicks.

An attempt was made to leave an equal number of cockerels and pullets in each pen, but owing to the difficulty experienced in distinguishing the sex, this was found to be impossible. At the end of the seventh week however, all the cockerels were taken out, and the experiment was thus divided into two periods as will be noted in the accompanying tables 3 and 4.

All the chicks were weighed daily and notes were made on their general condition at the end of each week. After the ninth day, the chicks were let out into small grass runs on alternate days. While this detracted somewhat from the scientific value of the experiment, it was considered that the practical value would be enhanced by keeping the chicks under normal conditions.

ARRANGEMENT OF PENS AND FEEDS.—A standard basal ration, similar to the one used during the brooding stage, consisting of standard chick scratch and mash; grit; greens; and both milk and water to drink, was fed to each pen, in addition to the special feeds which were as follows:—

Pen No. 1. Control.—Basal ration.

Pen No. 2. Wheat germ.—Eleven per cent by weight of dry mash.

Pen No. 3. Larro yeast.—One pound to one hundred pounds of dry mash.

Pen No. 4. Tomato pulp.—Enough to moisten the wet mash. About two teacupfuls per pen per day.

Pen No. 5. Cod liver oil.—Two tablespoonfuls (1 oz.) per pen per day at the beginning, gradually increased to one half-tablespoonful per bird per day.

Pen No. 6. Raw liver.—Enough to moisten the wet mash. About half an ounce per bird per day. The wet mash contained no beef meal.

Pen No. 7. Cod liver oil and raw liver.—Two tablespoonfuls of cod liver oil and one quarter of a pound of raw liver per pen per day, at the beginning, gradually increased to one half tablespoonful of cod liver oil and one-half ounce of raw liver per bird per day. The wet mash contained no beef-meal.

The price of all feeds were the same as for the brooding stage experiment.

The tables, which are worked out entirely on the average basis per bird in each pen, give the weekly weight and total, and percentage gain; the amount and value of special feed consumed and the value of all feed consumed, except milk, greens and grit, based upon the number of chicks left alive; the total mortality in each pen and the general condition of the birds at the beginning and end of the experiment. The condition of the chicks is denoted by the same letters as were used in the experiment with brooder chicks.

The first table gives this information for the seven-week period during which the cockerels and pullets were together, and the second for the further three-week period when only the pullets were left.

TABLE 3.—DETAIL—VITAMINE FEEDS IN REARING

(First seven-week period. Cockerels and Pullets).

Pen	Special feed	Num-of chicks	Average weight by weeks in ounces								Total gain	Per cent gain	Special feed consumed	Value	Value total feed consumed	Pounds of feed per pound gain	Mortality	Condition at beginning	Condition at end
			Begin-ning	1st week	2nd week	3rd week	4th week	5th week	6th week	7th week									
			oz.	oz.	oz.	oz.	oz.	oz.	oz.	oz.	oz.	%	ozs.	cts.	cts.	lb.			
1	Basal	25	5·32	7·08	9·6	12·04	15·42	19·42	22·67	24·83	19·51	368	.....	.....	10·70	5·5	1	G.	E.
2	Wheat germ	25	4·84	6·42	8·71	10·88	14·12	17·57	21·08	24·33	19·49	403	3·5	6·3	15·50	4·9	1	V.G.	G.
3	Larro yeast	25	5·08	6·60	9·04	11·00	14·5	18·29	22·0	25·17	20·09	395	0·50	3·00	14·50	5·6	1	V.F.	V.G.
4	Tomato pulp	25	4·84	6·16	8·08	10·36	13·67	17·67	21·83	25·33	20·49	423	40·00	10·0	20·00	4·8	1	G.	V.F.
5	Cod liver oil	25	5·68	8·48	10·84	13·36	16·96	21·04	24·96	28·96	23·28	410	6·00	8·00	20·30	5·3	.....	E.	V.G.
6	Raw liver	25	5·08	6·72	8·88	11·60	14·88	18·84	22·40	25·28	20·20	397	21·00	4·50	14·30	4·1	.....	V.G.	E.
7	Cod liver oil and raw liver	25	5·48	7·56	10·12	12·60	15·68	19·56	23·52	27·04	21·56	393	oil 40·0 liver 21·0	12·5	21·80	4·3	.....	G.	E.

TABLE 4.—DETAIL

(Second three-week period. Pullets only.)

1	Basal	9	21·80	24·90	28·40	31·00	.....	.....	.....	.....	9·20	42	.....	.....	7·60	8·2	.....	V.G.	V.G.
2	Wheat germ	12	21·3	23·70	26·00	29·30	.....	.....	.....	.....	8·00	38	2·00	3·60	9·60	8·0	.....	E.	V.G.
3	Larro yeast	10	22·80	25·60	28·20	31·20	.....	.....	.....	.....	8·40	37	0·17	1·05	9·05	7·6	.....	E.	V.G.
4	Tomato pulp	6	21·30	23·30	26·00	28·70	.....	.....	.....	.....	7·40	35	25·00	5·25	9·25	9·2	.....	G.	G.
5	Cod liver oil	8	26·50	29·50	32·50	34·50	.....	.....	.....	.....	8·00	30	6·50	9·0	16·00	8·0	.....	E.	V.G.
6	Raw liver	17	22·80	26·30	28·70	32·00	.....	.....	.....	.....	9·20	40	10·50	2·30	7·50	4·7	1	V.G.	V.G.
7	Cod liver oil and raw liver	11	24·00	27·30	30·20	32·70	.....	.....	.....	.....	8·70	36	oil 5·2 liver 8·00	1·75	8·45	6·4	.....	E.	G.

Note.—All figures are an average on basis of one bird.

REMARKS.—The relative positions of the different pens for the two respective periods are given in the table. For the entire ten weeks, however, the highest percentage gains were made by the birds receiving Larro yeast, followed closely by those on raw liver and cod liver oil respectively.

Taking the period of the entire experiment, the highest feed cost was recorded in the pen receiving cod liver oil, followed by that in which cod liver oil and raw liver were fed in combination.

It is worthy of note that during the whole period only one mortality occurred in the three pens which received cod liver oil, raw liver, and cod liver with raw liver respectively, and this bird was found to be suffering with ceca worms.

As will be noted by tables, the smallest amount of feed for one pound of gain, for both periods, was consumed by the birds given raw liver in addition to the basal ration.

Both this and the preceding experiment, would seem to indicate that the addition of certain nutritive elements to the basal ration, as usually fed, has a beneficial effect both upon the growth and vitality of chicks and growing birds. Further experimental work will have to be conducted, however, before definite conclusions can be drawn as to the best source of these elements.

COD LIVER OIL IN THE TREATMENT OF LEG WEAKNESS IN CHICKS

In view of the fact that the chicks receiving cod liver oil in the ration in the previous experiment, developed no symptoms of leg weakness, it was decided to try cod liver oil as a curative agent.

For this purpose, fifteen chicks suffering badly from leg weakness were selected from among the other pens, and placed on a basal ration plus cod liver oil, for a period of fourteen days. They were each dosed with one teaspoonful of cod liver oil (given with a medicine dropper) the first day, and from then on, one teaspoonful for each five chicks per day.

The chicks were weighed daily and at the same time notes were taken on their general condition and appearance. At the beginning of the period, all the chicks were down so badly on their legs that they were absolutely unable to walk. One of them was so bad in fact that it could hardly move at all, and it had every appearance of being about to die.

On the third morning, most of the chicks showed decided signs of improvement, and on the fifth day they all appeared to be much better. This improvement continued steadily until the eleventh day, when all the birds, excepting the one previously mentioned, were able to run around normally. By the fourteenth day, this last chick was also back in good condition, and consequently the experiment was discontinued. The birds were, however, put on a standard ration, and kept under observation for another three months, during which time there was no recurrence of the leg weakness and they developed quite normally.

At the start of this two week period the average weight of the chicks was 4·3 ounces, while at the end it was 7·7 ounces or a gain of 3·4 ounces.

While this is the result of only one experiment, from which no fixed conclusions should be drawn, it would appear that the addition of cod liver oil to the rations of brooder chicks not only tends to prevent leg-weakness (as evidenced by the preceding experiment), but has also a curative effect.

FEEDS FOR WINTER EGG PRODUCTION

In continuation of similar work undertaken in preceding years (details of which have been published in the annual reports of the Dominion Poultry Husbandman) a series of experiments was conducted during the winter of 1923-24, to test various feeds and their effects upon egg production and hatchability. One series covered different feeds as sources of animal protein, a second, various green feeds and substitutes, and the third some substitutes for green feed.

All experiments were conducted in the Experiment House, and lasted from November to April, inclusive. The stock used consisted of White Leghorn pullets, fifteen in a pen, those in each series being pen sisters—the offspring of the same male bird.

With the exception of the special feeds under experiment, all pens were handled and fed alike. The scratch grain was a commercial mixture costing $2.15 per hundred weight, the mash being the standard home-mixed mash consisting of equal parts by weight of bran, shorts, cornmeal, ground oats and beefmeal, valued at $2.18 per hundredweight. This mash was fed in all pens except those in which protein feeds were under test. Grit, shell and charcoal were kept before the birds in hoppers at all times, and unless otherwise indicated they were given both milk and water to drink.

Egg prices varied from 65 cents per dozen in November to 82½ cents, 80cents, 75 cents, 55 cents and 47½ cents for the respective succeeding months.

During the hatching season, all pens were mated, the male birds being changed from day to day, in order to reduce variation due to individuality. The hatching results are included in the summary of each experiment, and details regarding methods of feeding and costs of the respective feeds are given under the headings of each series.

VARIOUS FEEDS AS SOURCES OF ANIMAL PROTEIN

Four pens were used for this series, the object being to compare beef-meal, tankage, liver tankage and raw liver respectively as sources of animal protein. These feeds were valued per hundredweight as follows:—Beef-meal, $3.75; tankage, $2.50; liver tankage, $2.50; raw liver, $3.50.

All pens received standard scratch grain, the green feed consisting of mangels and sprouted oats in equal quantities, with water to drink.

The special feeds were given in the following manner:—

Pen 1. Beef-meal. Twenty per cent by weight in the dry mash.
Pen 2. Tankage. Twenty per cent by weignt in the dry mash.
Pen 3. Liver tankage. Twenty per cent by weight in the dry mash.
Pen 4. Raw liver. Chopped finely and given in a moist mash (enough to moisten it.)

Details of amounts of feed consumed, costs, eggs produced, values, cost o production and profits, are tabulated together with the hatching results in tables 5 and 6.

TABLE 5.—DETAIL—BEEF SCRAP VS. TANKAGE VS. LIVER TANKAGE VS. RAW LIVER

Pen and Feed	Month	Grain	Value	Mash	Value	Green feed	Value	Grit shell and charcoal	Value	Meat feed	Value	Total value feed	Eggs laid	Value	Cost per dozen	Profit over feed cost
		lb.	$ cts.	lb.	$ cts.	lb.	$ cts.	lb.	$ cts.	lb.	$ cts.	$ cts.		$ cts.	cts.	$ cts.
1. Beef scrap	Nov.	27	0 58	56	1 00	60	0 66	7½	0 09	14	0 52	2 85	235	12 73	14·6	9 88
	Dec.	40	0 86	61	1 09	100	1 10	7	0 07	15	0 56	3 68	288	19 80	15·3	16 12
	Jan.	46	0 99	40	0 72	100	1 10	6½	0 08	10	0 38	3 27	156	10 40	25·2	7 13
	Feb.	45	0 97	56	1 00	100	1 10	8	0 11	14	0 52	3 70	125	7 81	35·5	4 11
	March.	40	0 86	56	1 00	100	1 10	7	0 10	14	0 52	3 58	219	10 04	19·6	6 46
	April.	35	0 75	48	0 86	75	0 97	9	0 12	12	0 46	3 16	231	9 14	16·4	5 98
Total		233	5 01	317	5 67	535	6 03	45	0 57	79	2 96	20 24	1,254	69 92	19·4	49 68
2. Tankage	Nov.	25	0 54	66	1 18	60	0 66	7½	0·09	16	0 40	2 87	278	15 06	12·4	12 19
	Dec.	40	0 86	66	1 18	100	1 10	7½	0 09	16	0 40	3 63	327	22 48	13·3	18 85
	Jan.	46	0 99	32	0 57	100	1 10	5½	0 07	8	0 20	2 93	130	8 67	27·0	5 74
	Feb.	45	0 97	44	0 79	100	1 10	10	0 13	11	0 27	3 26	99	6 19	39·5	2 93
	March.	40	0 86	60	1 08	100	1 10	8	0 11	15	0 38	3 53	240	11 00	17·6	7 47
	April.	35	0 75	56	1 00	75	0 97	8	0 11	14	0 35	3 18	268	10 61	14·2	7 43
Total		231	4 97	324	5 80	535	6 03	46½	0 60	80	2 00	19 40	1,342	74 01	17·3	54 61
3. Liver tankage	Nov.	24	0 52	70	1 24	60	0 66	5	0 05	17	0 42	2 89	243	13 16	14·3	10 27
	Dec.	40	0 86	61	1 09	100	1 10	11½	0 13	15	0 38	3 56	331	22 76	12·9	19 20
	Jan.	46	0 99	40	0 72	100	1 10	5½	0 07	10	0 25	3 13	177	11 80	21·2	8 67
	Feb.	45	0 97	40	0 72	100	1 10	5	0 08	10	0 25	3 12	92	5 75	40·7	2 63
	March.	40	0 86	48	0 86	100	1 10	5	0 08	12	0 30	3 20	179	8 20	21·5	5 00
	April.	35	0 75	51	0 91	75	0 97	7	0 10	13	0 32	3 05	233	9 22	15·7	6 17
Total		230	4 95	310	5 54	535	6 03	39	0 51	77	1 92	18 95	1,255	70 89	18·1	51 94
4. Raw liver	Nov.	25	0 54	72	1 28	60	0 66	5½	0 07	33	1 20	3 75	203	11 00	22·1	7 25
	Dec.	40	0 86	57	1 02	100	1 10	12½	0 14	24	0 87	3 99	355	24 41	13·5	20 42
	Jan.	46	0 99	40	0 72	100	1 10	5½	0 07	30	1 07	3 95	144	9 60	32·9	5 65
	Feb.	45	0 97	43	0 77	100	1 10	6	0 09	30	1 07	4 00	118	7 37	40·7	3 37
	March.	40	0 86	48	0 86	100	1 10	4	0 07	32	1 15	4 04	236	10 82	20·5	6 78
	April.	35	0 75	40	0 72	75	0 97	7	0 10	35	1 25	3 79	205	8 11	22·2	4 32
Total		231	4 97	300	5 37	535	6 03	40½	0 54	184	6 61	23 52	1,261	71 31	22·4	47·79

TABLE 6.—DETAIL OF ANIMAL PROTEIN EXPERIMENT, WITH HATCHING RESULTS

Pen	Meat feed	Cost of meat feed	Total cost of feed	Eggs laid	Value	Cost per dozen	Profit over cost	Eggs set	Fertile	Hatched	Per cent fertile	Per cent fertile hatched	Per cent total hatched
		$ cts.	$ cts.		$ cts.	cts.	$ cts.						
1	Beef scrap	2 96	20 24	1,254	69 92	19·4	49 68	76	67	43	88·2	64·2	56·6
2	Tankage	2 00	19 40	1,342	74 01	17·3	54 61	87	80	57	91·9	71·3	65·5
3	Liver tankage	1 92	18 95	1,255	70 89	18·1	51 94	81	76	33	93·8	43·4	40·7
4	Raw liver	6 61	23 52	1,261	71 31	22·4	47 79	34	32	26	94·1	81·2	76·5

REMARKS.—Tankage gave the highest production, lowest cost for producing one dozen eggs, and greatest profit over cost of feed, being followed, so far as profit was concerned, by liver tankage, beef-meal and raw liver respectively.

Outstanding hatching results, however, were obtained from the birds receiving raw liver, the order of merit of the other feeds from this standpoint being, tankage, beef-meal and liver tankage.

In similar experiments conducted in previous years, difficulty was always experienced in getting the birds to eat enough tankage, owing to its unpalatability. The tankage used in this experiment, however, was particularly palatable and the birds ate it readily.

GREEN FEEDS AND SUBSTITUTES

The object of this series was to compare the relative values of mangels, sprouted oats and cabbage respectively as winter green feed for egg production, and also clover leaves and Epsom Salts as substitutes for these. In addition, one pen of birds received no green feed or substitutes.

In all six pens were used, all the birds receiving standard scratch grain, standard mash (with beef-meal), milk and water to drink, and beef-scrap in hoppers.

The values of the special feeds and the manner in which they were fed, were as follows:—

Pen 6. Mangels (50 cents per cwt.) hung on nails and eaten at will.
Pen 7. Sprouted Oats ($1.70 per cwt.) fed in small troughs once a day.
Pen 8. Clover Leaves ($1 per cwt.) fed in litter once a day.
Pen 9. Cabbages ($2 per cwt.) fed in litter once a day.
Pen 10. Epsom Salts ($3.50 per cwt.) 2 ounces per day, dissolved and mixed in wet mash.
Pen 11. No green feed.

Detail figures for each pen are given in tables 7, 8 and 9.

TABLE 7.—DETAIL—MANGELS VS. SPROUTED OATS VS. CLOVER LEAVES VS. CABBAGE VS. EPSOM SALTS VS. NO GREEN FEED

Pen and Feed	Month	Grain	Value	Mash	Value	Milk	Value	Meat	Value	Grit, shell, charcoal	Value	Green feed	Value	Total cost of feed	Eggs laid	Value	Cost per dozen	Profit over cost
		lbs.	$ c.	lbs.	$ c.	gals.	$ c.	lbs.	$ c.	lbs. ozs.	$ c.	lbs.	$ c.	$ c.		$ c.	cts.	$ c.
6. Mangels	Nov	25	0 54	100	2 18	22	0 66	4	0 15	6 8	0 08	60	0 30	3 91	337	18 25	13·9	14 34
	Dec	40	0 86	76	1 66	8	0 24	6	0 22	11 ..	0 14	50	25	3 37	337	23 17	12·0	19 80
	Jan	46	0 99	52	1 13	8	0 24	12	0 45	7 8	0 09	60	0 30	3 20	265	17 67	14·5	14 47
	Feb	45	0 97	50	1 09	8	0 24	8	0 30	7 ..	0 10	60	0 30	3 00	212	13 25	16·9	10 25
	March	40	0 86	60	1 31	8	0 24	12	0 45	8 ..	0 11	70	0 35	3 32	246	11 28	16·2	7 96
	April	35	0 75	50	1 09	7	0 21	5	0 19	7 ..	0 10	70	0 35	2 69	237	9 38	13·6	6 69
Total		231	4 97	388	8 46	61	1 83	47	1 76	47 ..	0 62	370	1 85	19 49	1,634	93 00	14·3	73 51
7. Sprouted oats	Nov	25	0 54	92	2 01	22	0 66	7	0 26	8 8	0 10	60	1 00	4 57	310	16 80	17·7	12 33
	Dec	40	0 86	74	1 60	8	0 24	5	0 20	10 8	0 12	75	1 28	2 30	336	23 10	15·4	18 80
	Jan	46	0 99	64	1 40	8	0 24	6	0 22	7 8	0 09	75	1 28	4 22	261	17 40	19·4	13 18
	Feb	45	0 97	60	1 31	8	0 24	7	0 26	8 ..	0 11	75	1 28	4 17	189	11 81	26·4	7 64
	March	40	0 86	90	1 96	8	0 24	18	0 67	11 ..	0 14	75	1 28	5 15	242	11 09	25·5	5 94
	April	35	0 75	70	1 53	8	0 24	7	0 26	12 ..	0 15	75	1 28	4 21	281	11 12	17·9	6 91
Total		231	4 97	450	9 81	62	1 86	50	1 87	57 8	0 71	435	7 40	26 62	1,619	91 32	19·7	64 70
8. Clover leaves	Nov	25	0 54	87	1 90	22	0 66	3	0 11	5 8	0 07	60	0 60	3 88	314	17 01	14·8	13 13
	Dec	40	0 86	76	1 66	8	0 24	6	0 22	11 8	0 13	60	0 60	3 71	331	22 76	13·4	19 05
	Jan	46	0 99	58	1 26	8	0 24	10	0 38	8 8	0 10	60	0 60	3 57	234	15 60	18·3	12 03
	Feb	46	0 99	50	1 09	8	0 24	10	0 38	6 ..	0 09	60	0 60	3 39	157	9 81	25·9	6 42
	March	40	0 86	65	1 41	8	0 24	10	0 38	11 ..	0 14	60	0 60	3 63	237	10 86	18·4	7 23
	April	35	0 75	50	1 09	7	0 21	9	0 33	12 ..	0 15	70	0 70	3 23	276	10 92	14·0	7 69
Total		232	4 99	386	8 41	61	1 83	48	1 80	54 8	0 68	370	3 70	21 41	1,549	86 96	16·6	65 55
9. Cabbages	Nov	25	0 54	75	1 64	22	0 66	9	0 33	7 8	0 09	60	1 20	4 46	263	14 25	20·3	9 79
	Dec	40	0 86	62	1 35	8	0 24	4	0 15	10 8	0 12	60	1 20	3 92	363	24 96	12·9	21 04
	Jan	46	0 99	42	0 92	8	0 24	10	0 38	4 8	0 06	15	0 30	2 89	193	12 87	17·9	9 98
	Feb	45	0 97	45	0 98	8	0 24	15	0 56	5 ..	0 08	20	0 40	3 23	190	11 88	20·4	8 65
	March	40	0 86	51	1 11	7	0 21	19	0 71	6 ..	0 09	15	0 30	3 28	210	9 63	18·7	6 35
	April	35	0 75	50	1 09	8	0 24	10	0 38	8 ..	0 11	20	0 40	2 97	262	10 37	13·6	7 40
Total		231	4 97	325	7 09	61	1 83	67	2 51	41 8	0 55	190	3 80	20 75	1,481	83 96	16·8	63 21

TABLE 7.—DETAIL—MANGELS VS. SPROUTED OATS VS. CLOVER LEAVES VS. CABBAGE VS. EPSOM SALTS VS. NO GREEN FEED

Pen and Feed	Month	Grain	Value	Mask	Value	Milk	Value	Meat	Value	Grit, shell, charcoal	Value	Green feed	Value	Total cost of feed	Eggs laid	Value	Cost per dozen	Profit over cost
		lbs.	$ c.	lbs.	$ c.	gals.	$ c.	lbs.	$ c.	lbs. ozs.	$ c.	lbs.	$ c.	$ c.		$ c.	cts.	$ c.
												lbs. oz.						
10. Epsom salts....	Nov.....	26	0 56	75	1 74	22	0 66	6	0 22	9 8	0 11	1 12	0 06	3 25	260	14 08	15·0	10 83
	Dec.....	40	0 86	85	1 85	8	0 24	4	0 15	7 8	0 09	1 12	0 06	3 25	347	23 86	11·2	20 61
	Jan.....	46	0 99	54	1 18	8	0 24	6	0 22	7 8	0 09	1 12	0 06	2 78	252	16 80	13·2	14 02
	Feb.....	45	0 97	55	1 20	8	0 24	11	0 42	7 ..	0 10	1 12	0 06	2 99	178	11 12	20·1	8 13
	March.....	40	0 86	50	1 09	7	0 21	17	0 64	6 ..	0 09	1 12	0 06	2 95	166	7 61	21·3	4 66
	April.....	35	0 75	40	0 87	7	0 21	8	0 30	6 ..	0 09	1 12	0 06	2 28	210	8 31	13·0	6 03
Total.....	.....	232	4 99	359	7 83	60	1 80	52	1 95	43 8	0 57	10 8	0 36	17 50	1,413	81 78	14·9	64 28
11. No green feed..	Nov.....	26	0 56	80	1 74	22	0 66	7	0 26	6 8	0 08	.. ..	.....	3 30	246	13 32	16·1	10 02
	Dec.....	40	0 86	75	1 64	8	0 24	2	0 07	11 8	0 13	.. ..	.....	2 94	349	23 99	10·1	21 05
	Jan.....	46	0 99	52	1 13	8	0 24	5	0 20	9 8	0 11	.. ..	.....	2 67	238	15 87	13·5	13 20
	Feb.....	45	0 97	60	1 31	8	0 24	8	0 30	8 ..	0 11	.. ..	.....	8 93	154	9 62	22·8	6 69
	March.....	40	0 86	60	1 31	7	0 21	12	0 45	12 ..	0 15	.. ..	.....	2 98	204	9 35	17·5	6 37
	April.....	35	0 75	48	1 05	7	0 21	9	0 33	10 ..	0 13	.. ..	.....	2 50	200	7 92	15·0	5 42
Total.....	.....	232	4 99	375	8 18	60	1 80	43	1 61	57 8	0 71	.. ..	.....	17 32	1,391	80 07	14·9	62 75

TABLE 8.—SUMMARY OF GREEN FEED EXPERIMENT, WITH HATCHING RESULTS

Pen	Green feed	Cost of green feed	Total cost of feed	Eggs laid	Value	Cost per dozen	Profit over cost	Eggs set	Fertile	Hatched	Per cent fertile	Per cent fertile hatched	Per cent total hatched
		$ cts.	$ cts.		$ cts.	cts.	$ cts.						
6	Mangels.....	1 85	19 49	1,634	93 00	14·3	73 51	60	53	13	88·3	24·5	21·6
7	Sprouted oats.....	7 40	26 62	1,619	91 32	19·7	64 70	93	90	27	96·8	30·0	29·0
8	Clover leaves.....	3 70	21 41	1,549	86 96	16·6	65 55	72	66	11	91·6	16·7	15·3
9	Cabbages.....	3 80	20 75	1,481	83 96	16·8	63 21	82	77	24	93·9	31·2	29·3
10	Epsom salts.....	0 36	27 50	1,413	81 78	14·9	64 28	57	51	17	89·5	33·3	29·9
11	No green feed.....	.....	17 32	1,391	80 07	14·9	62 75	48	44	8	91·7	18·2	16·7

REMARKS.—The birds receiving mangels gave the best production and highest profits, and a dozen eggs was produced most cheaply in this pen. According to profit over cost of feed, the other special feeds would be placed in this order: Clover leaves, sprouted oats, Epsom salts, cabbages and no green feed.

It will be noticed, however, that the pen fed Epsom salts gave the best hatching results, followed by cabbages, sprouted oats, mangels, no green feed and clover leaves respectively.

In order to compare these results with those obtained from a similar experiment conducted last year, a summary average of the two is given in table 9.

Table 9.—Summary of Two Years' Experiments with Green Feeds and Substitutes

Year	Green feed	Cost of green feed	Total cost of feed	Eggs laid	Value	Cost per dozen	Profit over cost	Eggs set	Fertile	Hatched	Per cent fertile	Per cent fertile hatched	Per cent total hatched
		$ cts.	$ cts.		$ cts.	cts.	$ cts.						
1923	Mangels	1 80	16 51	1,285	73 11	15·4	56 60	261	240	77	91·9	32·0	29·5
1924	Mangels	1 85	19 49	1,634	93 00	14·3	73 51	60	53	13	88·3	24·5	21·6
Average		1 82	18 00	1,459	83 05	14·8	65 05	160·5	146·5	45	90·1	30·5	28·0
1923	Sprouted oats	0 48	14 18	1,403	79 41	12·1	69 23	248	233	87	93·9	37·3	35·1
1924	Sprouted oats	7 40	26 62	1,619	91 32	19·7	64 70	93	90	27	96·8	30·0	29·0
Average		3 94	20 40	1,561	85 36	15·7	66 96	170·5	161·5	57	94·7	35·3	33·4
1923	Clover	1 50	16 58	1,438	83 76	13·8	67 18	251	232	118	92·4	50·8	47·0
1924	Clover	3 70	21 41	1,549	86 96	15·9	65 55	72	66	11	91·6	16·7	15·3
Average		2 60	18 19	1,493	85 36	14·8	66 36	161·5	149	64·5	92·2	43·3	39·9
1923	Epsom salts	0 78	15 43	1,414	80 96	13·1	65 53	313	292	131	93·3	44·8	41·8
1924	Epsom salts	0 36	17 50	1,413	81 78	14·9	64 28	57	51	17	89·5	33·3	29·9
Average		0 57	16 46	1,413	81 37	14·0	64·90	185	171·5	74	92·7	43·1	40·0

Remarks.—Taking the average for the two years, sprouted oats gave the greatest profits, followed in order by clover leaves, mangels, and Epsom salts. Better hatching results, however, were obtained from the use of Epsom salts, the other feeds in order of merit in that respect being clover, sprouted oats and mangels.

SUBSTITUTES FOR GREEN FEED

Succulent green feed cannot always be secured during the winter months, and consequently it is sometimes necessary to use a substitute feed. In order to test the relative values of clover leaves, sweet clover meal, alfalfa meal and tomato pulp for this purpose, the four feeds were used in this experiment.

All the birds used were fed standard scratch grain and standard mash (containing beef-meal), beef-scrap was kept continually before them in hoppers and they had both milk and water to drink.

The pens were arranged and the special feeds given as follows:—

Pen 12. Clover leaves ($1 per cwt.) fed in the litter once a day.

Pen 13. Clover meal ($1.65 per cwt.) mixed in the wet mash fed at noon.

Pen 14. Alfalfa meal ($1.75 per cwt.) mixed in the wet mash fed at noon.

Pen 15. Tomato pulp ($5 per cwt.) mixed in the wet mash fed at noon. Owing to the difficulty in procuring it, the pulp was not fed until January 10. Previous to that date this pen received mangels and sprouted oats in equal quantities.

The following tables show the detailed results:—

TABLE 10—DETAIL—CLOVER LEAVES VS SWEET CLOVER MEAL VS ALFALFA MEAL VS TOMATO PULP

Pen and Feed	Month	Grain	Value	Mash	Value	Milk	Value	Meat	Value	Grit shell charcoal		Value	Green	Value	Total cost of feed	Eggs laid	Value	Cost per doz.	Profit over cost
		lbs.	$ c.	lbs.	$ c.	gals.	$ c.	lbs.	$ c.	lbs.	oz.	$ c.	lbs.	$ c.	$ c.		$ c.	$ c.	$ c.
12. Clover leaves.....	Nov.....	25	0 54	82	1 79	22	0 66	9	0 34	6	8	0 08	15	0 15	3 56	157	8 50	27·2	4 94
	Dec.....	40	0 86	79	1 72	8	0 24	7	0 26	10	8	0 12	20	0 20	3 40	243	16 71	16 4	13 31
	Jan.....	46	0 99	56	1 22	8	0 24	13	0 49	7	8	0 09	60	0 60	3 63	120	8 00	36·3	4 37
	Feb.....	45	0 97	71	1 55	8	0 24	16	0 60	4	0	0 07	60	0 60	4 03	88	5 50	54·9	1 47
	March.....	40	0 86	100	2 18	8	0 24	20	0 75	11	0	0 14	60	0 60	4 77	203	9 30	28·2	4 53
	April.....	35	0 75	80	1 74	9	0 27	7	0 27	9	0	0 12	60	0 60	3 74	209	8 27	21·4	4 53
Total.....	.....	231	4 97	468	10 20	63	1 89	72	2 70	48	8	0 62	275	2 75	23 13	1,020	56 28	27·2	33 15
13. Sweet clover meal.	Nov.....	28	0 60	87	1 90	22	0 66	6	0 22	8	8	0 10	15	0 25	3 73	149	8 07	30·0	4 34
	Dec.....	40	0 86	70	1 53	8	0 24	7	0 26	9	8	0 11	20	0 33	3 33	275	18 91	14·5	15 58
	Jan.....	46	0 99	70	1 53	8	0 24	13	0 49	10	8	0 12	25	0 41	3 78	173	11 50	26·2	7 72
	Feb.....	45	0 97	60	1 30	8	0 24	15	0 56	8	0	0 11	25	0 41	3 59	167	10 44	25·8	6 85
	March.....	40	0 86	80	1 74	8	0 24	19	0 72	11	0	0 14	25	0 41	4 11	248	11 37	19·9	7 26
	April.....	35	0 75	60	1 30	9	0 27	7	0 26	8	0	0 11	25	0 41	3 10	229	9 06	16·2	5 96
Total.....	.....	234	5 03	427	9 30	63	1 89	67	2 51	55	8	0 69	135	2 22	21 64	1,241	69 35	20·9	47 71
14. Alfalfa meal.....	Nov.....	29	0 62	87	1 90	22	0 66	8	0 30	7	8	0 09	15	0 25	3 82	98	5 31	46·8	1 49
	Dec.....	40	0 86	78	1 71	8	0 24	6	0 22	9	8	0 11	20	0 35	3 49	263	18 08	15·9	14 59
	Jan.....	46	0 99	52	1 13	8	0 24	13	0 49	6	8	0 08	25	0 44	3 27	163	10 87	24·1	7 60
	Feb.....	45	0 97	60	1 30	8	0 24	14	0 53	6	0	0 09	25	0 44	3 57	94	5 88	45·6	2 31
	March.....	40	0 86	80	1 47	8	0 24	11	0 41	7	0	0 10	25	0 44	3 79	179	8 20	25·4	4 41
	April.....	35	0 75	50	1 09	9	0 27	4	0 15	7	0	0 10	25	0 44	2 80	216	8 55	15·6	5 75
Total.....	.....	235	5 05	407	8 87	63	1 89	56	2 10	43	8	0 57	135	2 36	20 74	1,013	56 89	24·6	36 15
15. Tomato pulp (after Jan. 10).	Nov.....	32	0 69	75	1 64	22	0 66	9	0 34	3	8	0 05	60	0 66	4 04	105	5 69	46·1	1 65
	Dec.....	40	0 86	60	1 30	8	0 24	7	0 26	10	8	0 12	100	1 10	3 88	256	17 60	18·2	13 72
	Jan.....	46	0 99	50	1 09	8	0 24	7	0 26	8	8	0 10	43	0 87	3 55	176	11 73	24·2	8 18
	Feb.....	45	0 97	40	0 87	8	0 24	11	0 41	3	0	0 06	14	0 70	3 25	142	8 88	27·4	5 63
	March.....	40	0 87	70	1 53	6	0 18	10	0 37	7	0	0 10	15·8	0 77	3 81	191	8 75	23·9	4 94
	April.....	35	0 75	40	0 87	8	0 24	3	0 12	7	0	0 10	15	0 75	2 83	182	7 20	18·7	4 37
Total.....	.....	238	5 12	335	7 30	60	1 80	47	1 76	39	8	0 53	247·8	4 85	21 36	1,052	59 85	24·4	38 49

TABLE 11—SUMMARY OF CLOVER, CLOVER MEAL, ALFALFA MEAL, AND TOMATO PULP EXPERIMENT WITH HATCHING RESULTS

Pen	Green feed	Cost of green feed	Total coast of feed	Eggs laid	Value	Cost per doz.	Profit over cost	Eggs set	Fertile	Hatched	Percent fertile	Percent fertile hatched	Percent total hatched
		$ c.	$ c.		$ c.	c.	$ c.						
12	Clover leaves	2 75	23 13	1,020	56 28	27·2	33 15	62	61	27	98·4	44·3	43·5
13	Clover meal	2 22	21 64	1,241	69 35	20·9	47 71	72	66	26	91·7	39·4	41·7
14	Alfalfa meal	2 36	20 74	1,013	56 89	24·6	36 15	50	36	15	72·0	41·7	30·0
15	Tomato pulp	4 85	21 36	1,052	59 85	24·4	38 49	22	19	3	86·4	15·8	13·6

REMARKS:—The clover meal gave by far the best results for production, cost of producing eggs and profits, being followed by tomato pulp, alfalfa meal and clover leaves.

The best hatching results however, were obtained from the pen receiving clover leaves, followed closely by clover meal. The hatchability of the eggs from birds fed the tomato pulp was exceptionally poor. As these are the results of only one year's experiment, no definite conclusions can be drawn. It should be noted that the clover and alfalfa meals used in this experiment were not the ordinary commercial meals, but were of an exceptionally high quality, prepared by an Ontario farmer.

PRESERVING AND STORING EGGS

In 1923 a series of experiments was conducted covering a new process for preserving eggs, known as "Guaranize", and also different methods of storing eggs for winter use. Full details of these were given in the annual report for that year.

This year similar experiments were undertaken in order to verify the results obtained previously, and a summary is included giving the results of each experiment for two years.

The eggs were all stored in June with the Canadian Cold Storage Co., Ottawa, and kept under ordinary storage conditions, until December. Both before being put in and when taken out of storage, all the eggs were graded by a government egg inspector, whose report is given in the tables concerning each experiment.

PROCESSED VS. NON-PROCESSED NEW-LAID EGGS

The "Guaranize" process consists of dipping the eggs in a boiling solution of wax and oil, and for this experiment two thirty-dozen cases of new laid eggs were used. The contents of one case were treated before being stored, the others being left in their natural state. Details regarding weights and grades will be found in the following table.

TABLE 12—DETAIL—PROCESSED VS NON-PROCESSED NEW-LAID EGGS

Case No.	Kind of eggs	Dozens	Net weight eggs when stored	Net weight eggs when taken out	Grade when stored					Grade when taken out					
					Specials	Extras	Firsts	Seconds: Heavy yolk	Seconds: Weak and watery	Extras	Firsts	Seconds: Heavy yolk	Seconds: Weak and watery	Cracked	Bad
			lbs. oz.	lbs. oz.											
1	Non-processed	30	44–4	43–0	188	136	35	....	1	262	72	2	23	1	....
2	Processed	30	43–12	43–12	280	62	12	6	....	318	25	....	2	15	....

REMARKS:—This experiment would seem to indicate that there is a decided advantage in processing eggs for storage purposes. Of the processed eggs graded as specials and extras when stored, 93 per cent were graded as extras when taken out, as compared with 81 per cent for those non-processed.

TABLE 13—SUMMARY OF TWO YEARS' EXPERIMENTS

Year					Not graded										
1923	Non-processed	30	44–14	43–8						153	181	....	10	16	....
1924	"	30	44–4	43–0	188	136	35	....	1	262	72	2	23	1	....
	Total	60	89–2	86–8	....	....	....	....	....	415	153	2	33	17	....
1923	Processed	30	44–4	44–0			Not graded			101	240	....	3	15	1
1924	"	30	43–12	43–12	280	62	12	6	....	318	25	....	2	15	....
	Total	60	88–0	87–12	....	....	....	....	....	419	265	....	5	30	1

REMARKS:—Taking the summary of the two year's experiments, the processed eggs graded slightly better when taken out of storage.

PROCESSED VS. NON-PROCESSED COMMERCIAL EGGS

The only difference between this and the foregoing experiment was in the quality of the eggs when put into storage, commercial eggs being used instead of new laid. Half of these in each case were graded as extras and the other half as firsts.

Details are given in table 14.

TABLE 14—DETAIL—PROCESSED VS NON-PROCESSED COMMERCIAL EGGS

Case No.	Type of case and kind of eggs	Dozens	Net weight of eggs when stored	Net weight of eggs when taken out		Grade when stored					Grade when taken out				
						Extras	Seconds: Firsts	Seconds: Heavy yolk	Seconds: Weak and watery	Extras	Firsts	Seconds: Hevy yolk	Seconds: Weak and watery	Cracked	Bad
			lbs. oz.	lbs. oz.											
10	Extras (non-processed)..	15	22-0	21-0	....	180	....	....	....	125	41	6	6	2	....
	Firsts (")..	15	23-12	23-4	....	....	180	....	....	....	138	....	35	7	....
	Total.....	30	45-12	44-4	....	180	180	....	....	125	179	6	41	9	....
11	Extras (processed).....	15	21-12	22-0	....	180	....	....	....	162	10	....	5	3	....
	Firsts (").....	15	24-4	24-0	....	....	180	....	....	....	159	....	5	16	....
	Total.....	30	46- 0	46- 0	....	180	180	....	....	162	169	....	10	19	....

REMARKS:—There was a decided difference, nearly 10 per cent in favour of the processed eggs.

TABLE 15—SUMMARY OF TWO YEARS' EXPERIMENTS

Year															
1923	Non-processed.....	27½	42- 2	41- 7	....	165	165	....	....	82	236	....	....	12	....
1924	"	30	45-12	44- 4	....	180	180	....	....	125	179	6	41	9	....
	Total.....	57½	87-14	85-11	....	345	345	....	....	207	415	6	41	21	....
1923	Processed.....	27½	42- 7	41-13	....	165	165	....	....	118	175	....	19	15	3
1924	"	30	46- 0	46- 0	....	180	180	....	....	162	169	....	10	19	....
	Total.....	57½	87- 7	87-13	....	345	345	....	....	280	344	....	29	34	3

REMARKS:—There were over 10 per cent more processed eggs graded as extras when taken out of storage, indicating the value of the process for preserving commercial eggs in storage.

FARM (NON-VENTILATED) CASE VS. COMMERCIAL CASE

The object of this experiment was to compare the heavy, solid type of cases used on the Experimental Farm, with the lighter commercial cases, which are more open in construction. Both processed and non-processed eggs were stored in each type of case, and detailed results were as shown in table 16.

TABLE 16—DETAIL—FARM (NON-VENTILATED) VS COMMERCIAL EGG CASES

Case No.	Type of case and kind of eggs	Dozens	Net weight eggs when stored	Net weight eggs when taken out	Grade when stored					Grade when taken out					
					Specials	Extras	Firsts	Seconds: Heavy yolk	Seconds: Weak and watery	Extras	Firsts	Seconds: Heavy yolk	Seconds: Weak and watery	Cracked	Bad
			lbs. oz.	lbs. oz.											
1	Farm (non-processed)...	30	44– 4	43– 0	188	136	35	....	1	262	72	2	23	1	....
2	Farm (processed).....	30	43–12	43–12	280	62	12	6	....	318	25	....	2	15	....
	Total.....	60	88– 0	87– 2	468	198	47	6	1	580	97	2	25	16	....
3	Commercial (non-processed).....	30	43–14	42– 8	271	69	20	....	....	293	46	....	7	14	....
4	Commercial (processed).	30	43–12	43–14	309	46	5	....	....	327	12	3	....	18	....
	Total.....	60	87–10	86– 6	580	115	25	....	....	620	58	3	7	32	....

REMARKS:—Only a very slight difference in favour of the farm type of case.

TABLE 17—SUMMARY OF TWO YEARS' EXPERIMENTS

Year						Not taken									
1923	Farm case.....	60	89– 2	87– 8						254	421	....	13	31	1
1924	"	60	88– 0	87– 2	468	198	47	6	1	580	97	2	25	16	....
	Total.....	120	177– 2	174–10	....	....	....	....	....	834	518	2	38	47	1
1923	Commercial case.....	60	88– 5	86– 4		Not taken				242	429	....	17	31	1
1924	"	60	87–10	86– 6	580	115	25	....	....	620	58	3	7	32	....
	Total.....	120	175–15	172–10	....	....	....	....	....	862	487	3	24	63	1

REMARKS:—Practically no difference between the two types of cases, the eggs stored in the farm cases grading slightly better when taken out of storage. Two year's experiments conducted at Charlottetown (P.E.I.) Experimental Farm gave slightly better results from the use of commercial cases.

CLEAN VS. DIRTY VS. WASHED EGGS FOR STORAGE

This experiment was conducted in order to test the relative keeping qualities of clean eggs and dirty eggs that had been washed before storing, and others that had been left dirty. One half case of each, both processed and non-processed, were used and details are given in the following tables:—

TABLE 18—DETAIL—CLEAN VS DIRTY VS WASHED EGGS FOR STORAGE

Case No.	Kind of eggs	Dozens	Net weight eggs when stored	Net weight eggs when taken out	Grade when stored					Grade when taken out					
								Seconds				Seconds			
					Specials	Extras	Firsts	Heavy yolk	Weak and watery	Extras	Firsts	Heavy yolk	Weak and watery	Cracked	Bad
			lbs. oz.	lbs. oz.											
5 (a)	Clean (non-processed)...	15	22– 6	21–13	136	37	7	....	....	145	22	....	4	9	....
7 (a)	Clean (processed).....	15	21–14	22– 0	161	15	4	....	....	168	4	....	2	5	1
	Total.....	30	44– 4	43–13	297	52	11	....	....	313	26	....	6	14	1
5 (b)	Washed (non-processed).	15	22– 2	21–12	166	11	3	....	....	94	42	2	34	7	1
7 (b	Washed (processed).....	15	22– 2	22– 4	164	14	....	....	2	166	2	....	2	10	....
	Total.....	30	44– 4	44– 0	330	25	3	....	2	260	44	2	36	17	1
6 (a)	Dirty (non-processed)...	15	22– 8	21–14	166	9	....	2	3	143	28	....	7	2	....
6 (b)	Dirty (processed).....	15	22– 4	22– 0	159	21	....	....	....	167	6	....	1	6	....
	Total.....	30	44–12	43–14	325	30	....	2	3	310	34	....	8	8	....

REMARKS:—When taken out of storage there was practically no difference between the quality of the clean and dirty eggs. The washed eggs were nearly 50 per cent inferior to both of the other lots.

TABLE 19—SUMMARY OF TWO YEARS' EXPERIMENTS

Year											
1923	Clean.....	6	9–14	9–13	Not taken	38	31	....	....	3	....
1924	Clean.....	30	44– 4	43–13	"	313	26	....	6	14	1
	Total.....	36	54– 2	53–10	Not taken	351	57	....	6	17	1
1923	Washed.....	12	17–15	17–12	"	91	50	....	....	3	....
1924	Washed.....	30	44– 4	44– 0	"	260	44	2	36	17	1
	Total.....	42	62– 3	61–12	Not taken	351	94	2	36	20	1

REMARKS:—Taking the results of two year's experiment there was a difference of over 12 per cent in favour of clean eggs. Similar results were obtained from two experiments conducted at the Experimental Farm at Charlottetown, P.E.I.

CLEAN VS. DIRTY FLATS AND FILLERS

In this experiment, half the eggs were stored in clean flats and fillers, and half in dirty. The following tables give the results obtained:—

TABLE 20—DETAIL—CLEAN VS DIRTY FLATS AND FILLERS

Case No.	Kind of flats and fillers.	Dozens	Net weight eggs when stored	Net weight eggs when taken out	Grade when stored					Grade when taken out					
					Specials	Extras	Firsts	Seconds: Heavy yolk	Seconds: Weak and watery	Extras	Firsts	Seconds: Heavy yolk	Seconds: Weak and watery	Cracked	Bad
			lbs. oz.	lbs. oz.											
8 (a)	Clean (non-pressed).....	15	22- 4	21-12	149	28	3	....	....	160	9	....	5	5	1
9 (a)	Clean (processed).....	15	22-12	22- 4	161	16	1	....	1	150	10	1	....	19	....
	Total.....	30	45- 0	44- 0	310	44	4	....	1	310	19	1	5	24	1
8 (b)	Dirty (non-processed)...	15	22- 0	21- 4	158	17	2	....	3	131	30	....	14	5	....
9 (b)	Dirty (processed).....	15	22- 8	22- 6	160	12	8	....	....	161	11	1	....	7	....
	Total.....	30	44- 8	43-10	318	29	10	....	3	292	41	1	14	12	....

REMARKS:—Slightly better results were obtained from the use of clean flats and fillers.

TABLE 21—SUMMARY OF TWO YEAR'S EXPERIMENTS

Year												
1923	Clean.....	30	43-14	40-14	Not taken	164	186	....	1	7	....
1924	Clean.....	30	45- 0	44- 0	"	310	19	1	5	24	1
	Total.....	60	88-14	84-14	Not taken	474	205	1	6	31	1
1923	Dirty.....	30	43- 8	43- 4	"	153	200	....	1	6	....
1924	Dirty.....	30	44- 8	43-10	"	292	41	1	14	12	....
	Total.....	60	88- 0	86-14	Not taken	445	241	1	15	18	....

REMARKS:—Both years results show a slight difference in favour of clean flats and fillers. These results were also borne out by two similar experiments conducted at Charlottetown, P.E.I.

STORING EGGS WITH SMALL ENDS UP VS. SMALL ENDS DOWN

As the title indicates, half the eggs used for this experiment were stored with the small end up, and the others with the small end down.

TABLE 22—DETAIL—STORING EGGS SMALL ENDS UP VS SMALL ENDS DOWN

Case No.	Method of Storing kind of eggs	Dozens	Net weight eggs when stored	Net weight eggs when taken out	Grade when stored					Grade when taken out					
					Specials	Extras	Firsts	Seconds: Heavy yolk	Seconds: Weak and watery	Extras	Firsts	Seconds: Heavy yolk	Seconds: Weak and watery	Cracked	Bad
			lbs. oz.	lbs. oz.											
12 (a)	Small end up (non-processed)	15	22– 4	21– 8	162	20	....	....	....	70	30	1	59	19	1
13 (a)	Small end up (processed)	15	22– 2	22– 5	143	33	3	....	1	134	20	3	3	20	....
	Total	30	44– 6	43–13	305	53	3	....	1	204	50	4	62	39	1
12 (b)	Small end down (non-cessed)	15	22– 4	21–12	147	33	....	....	....	136	20	....	6	18	....
13 (b)	Small end down (processed)	15	22– 8	22– 4	133	46	....	....	1	125	34	3	....	17	1
	Total	30	44–12	44– 0	280	79	....	....	1	261	54	3	6	35	1

REMARKS:—There was a difference of 14 per cent in favour of storing with small ends down.

TABLE 23—SUMMARY OF TWO YEARS' EXPERIMENTS

Year											
1923	Small ends up	30	44– 8	44– 1	Not taken	109	173	56	16	4	2
1924	Small ends up	30	44– 6	43–13	"	204	50	4	62	39	1
	Total	60	88–14	87–13	Not taken	313	223	60	78	43	3
1923	Small ends down	30	43– 0	43– 2	"	234	117	....	....	8	1
1924	Small ends down	30	44–12	44– 0	"	261	54	3	6	35	1
	Total	60	87–12	87– 2	Not taken	495	171	3	6	43	2

REMARKS:—The results indicate most strikingly that eggs should be stored with the small ends down as there was a difference of over 25 per cent in favour of this method. Results obtained at Charlottetown confirm this in an equally forcible manner.

THE VALUE OF THE "GUARANIZE' PROCESS

As will have been noted, half the eggs used in the foregoing experiments, were stored in their natural state, wnile the other half were treated by the "Guaranize" process immediately before being placed in storage.

The following table gives a summary of all the experiments comparing the treated eggs with those which were untreated:—

TABLE 24—DETAIL—SHOWING THE VALUE OF THE "GUARANIZE" PROCESS

Kind of eggs	Dozens	Net weight of eggs when stored		Net weight of eggs when taken out		Grade when taken out					
						Extras	Firsts	Seconds		Cracked	Bad
								Heavy yolk	Weak and watery		
		lbs.	oz.	lbs.	oz.						
Non-processed	195	289	10	281	7	1,559	478	11	200	89	3
Processed	195	289	10	289	1	1,878	293	11	20	136	2

REMARKS:—Judged by the candling report, the eggs treated by the "Guaranize" process kept much better than the others. When taken out 80 per cent of the former were graded as Extras as against 66 per cent of the latter. About 30 dozen of each kind were tested when taken out, to compare them for household use. The reports indicate that the flavour of the processed eggs was far superior to that of the others.

TABLE 25—SUMMARY OF TWO YEAR'S EXPERIMENTS

Year 1923—											
Non-processed	186½	277	4	270	6	859	1,237	30	32	78	2
Year 1924—											
Non-processed	195	289	10	281	7	1,559	478	11	200	89	3
Total	381½	566	14	551	13	2,418	1,715	41	232	167	5
Year 1923—											
Processed	186½	276	9	271	15	880	1,202	26	48	75	7
Year 1924—											
Processed	195	289	10	289	1	1,878	293	11	20	136	2
Total	381½	566	3	561	0	2,758	1,495	37	68	211	9

REMARKS:—As will be noticed, the results obtained with the processed eggs in 1924 were much better than in 1923. This may be accounted for by the fact that in 1923 owing to lack of detailed instructions regarding the correct use of the "Guaranize" solution, it was not applied in the exact condition recommended by the manufacturers.

The two years' work, however, would indicate that this is an excellent process for preserving eggs in storage.

General Remarks.—This series of experiments, extended over two years, has brought out several points, among which the following are the most important:—

(1) All eggs treated by the "Guaranize"process, grade much better when taken out of storage, and have a decidedly better flavour than those that have not been so treated.

(2) In order to obtain the best results, eggs should be stored with the small ends down.

(3) The freshness of the eggs, has an important bearing upon their keeping qualities when placed in storage.

(4) Clean flats and fillers are preferable to dirty ones, and clean eggs keep better than either dirty or washed eggs.

Practically all these experiments with the exception of those involving the "Guaranize" process, were repeated at the Experimental Farms and Stations at Charlottetown, Brandon and Agassiz. Detailed results are given in the annual reports of these respective Stations, and with slight variations they tend to bear out these obtained here at Ottawa.

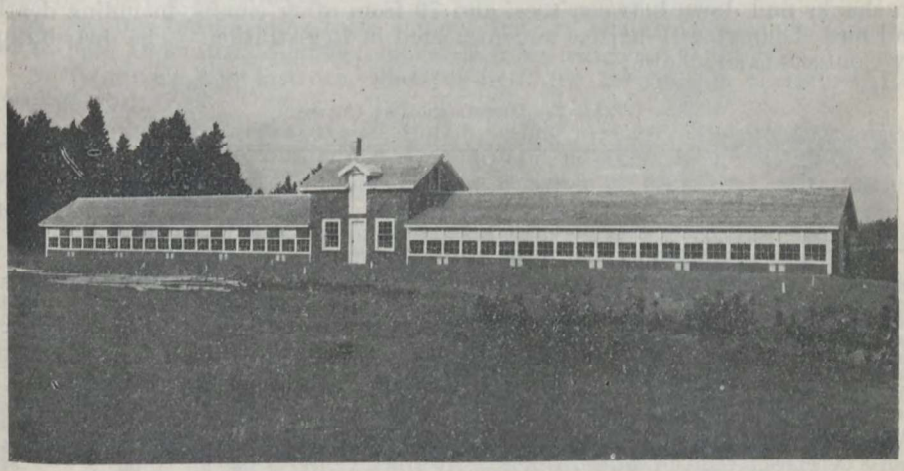
CANADIAN NATIONAL EGG-LAYING CONTESTS

During the year twelve Egg-Laying Contests have been conducted by this division. The Canadian Contest, international in its scope, was conducted at Ottawa, while the remaining eleven Contests were provincial in nature. The location of the Contests and various details are given in the following table:—

TABLE 26—NUMBER OF CONTESTS AND NUMBER OF BIRDS IN EACH. NOVEMBER 1, 1923, TO OCTOBER 29, 1924

Contest	Number of birds	Average number eggs laid	Cost per dozen	Production of leading pen	Production of leading bird
		per bird	cts.		
Canadian	800	166·2	14·1	2,208	272
Prince Edward Island	200	170·8	15·3	2,135	267
Nova Scotia	200	176·8	15·3	2,372	313
New Brunswick	200	165·0	19·5	2,190	259
Quebec East	170	138·0	17·2	2,002	268
Quebec West	190	154·5	17·5	1,927	253
Ontario	390	164·9	14·7	2,281	275
Manitoba	260	166·9	13·8	2,323	269
Saskatchewan	230	112·5	12·0	1,837	242
Alberta	270	178·2	10·9	2,331	305
British Columbia	360	206·7	13·0	2,422	308
Vancouver Island	340	199·8	15·4	2,357	300
Totals and averages	3,610	169·6	14·5		

NOTE.—Ten birds constitute a pen and the average egg production per bird for the 3,610 birds was 169·6 eggs, at a cost per dozen for feed only of 14·5 cents.



EGG-LAYING CONTEST HOUSE, KENTVILLE

This is a new house built for the "Nova Scotia Southern" and is similar to several used to house contest pens or for breeding purposes at other Experimental Farms. The Contest feed house is 16 feet by 20 feet and the wings are each 60 feet long. The house will have duplicate yards, which will be cultivated and cropped alternately.

TABLE 27—NUMBER OF BIRDS AND AVERAGE PRODUCTION BY VARIETIES OF ALL CONTESTS

Variety	Number of birds	Average production
S.C. White Leghorns	1,400	183·4
Barred Plymouth Rocks	1,330	167·2
White Wyandottes	480	160·4
S.C. Rhode Island Reds	190	144·7
S.C. Anconas	70	163·0
White Plymouth Rocks	50	120·1
S.C. Brown Leghorns	20	82·3
R.C. Rhode Island Reds	10	191·8
R.C. Brown Leghorns	10	191·5
White Orpingtons	10	166·2
Partridge Plymouth Rocks	10	143·8
Chantecler	10	129·4
Buff Orpingtons	10	123·4
Silver Laced Wyandottes	10	120·6
Total and average	3,610	169·6

Another series of Egg-Laying Contests was started November 1, 1924 and in addition to the twelve Contests conducted the previous year, a new one was started at Kentville, Nova Scotia. This new Contest has 20 pens and like the others each pen is made up of ten birds. In the thirteen Contests now in operation there are 4,150 birds.

REGISTRATION

Registration was granted to all birds laying 200 eggs or over providing the birds were typical of the breed, free from standard disqualifications and that the eggs laid, averaged 24 ounces or over to the doz. While 1,088 birds laid 200 eggs or over during the Contest year, only 750 qualified for Registration. Of the remainder, 218 were disqualified for laying undersized eggs, 41 for stubs on shanks and down between toes, and 79 from other causes, including deaths and birds belonging to parties not interested in Registration. The distribution by Contests is as follows:—

TABLE 28—DISTRIBUTION BY CONTESTS

Contest	Number laying 200 eggs and over	Qualified for registration	Disqualified
Canadian	245	200	45
Prince Edward Island	49	38	11
Nova Scotia	70	58	12
New Brunswick	45	18	27
Quebec East	24	17	7
Quebec West	26	19	7
Ontario	100	82	18
Manitoba	58	42	16
Saskatchewan	9	1	8
Alberta	110	96	14
British Columbia	189	107	82
Vancouver Island	163	75	88
Total	1,088	753	335

At present there are 263 poultry breeders in Canada doing breeding work with registered birds. The total registered birds is 1,420, there being 667 still living from previous years, which when added to the 753 qualifying in 1924 makes the above mentioned total.

TABLE 29—DISTRIBUTION OF BREEDERS AND REGISTERED BIRDS

Province	Breeders	Registered birds
Prince Edward Island	20	72
Nova Scotia	17	87
New Brunswick	22	80
Quebec	22	68
Ontario	67	511
Manitoba	15	78
Saskatchewan	7	31
Alberta	28	186
British Columbia	65	307
Total	263	1,420

The growth of Registration has been gradual and constant. The first year of Registration there were 59 breeders of Registered birds in the Dominion, mostly in the Province of Ontario. The second year the number had increased to 126 breeders. In 1924, the third year of Registration, the number of breeders had incseased to 263 with 1,420 birds, distributed throughout the various Provinces.

INSPECTION

The inspection of registered stock is for the purpose of,—

1. Identifying (by means of the breeders registered tattoo marks), as qualified registered stock, the females mated for the season's hatching.
2. Certifying the standard quality and fitness of the males mated to registered females.
3. Examining trap-nest and hatching records, and sealed identification bands on the chicks hatched.
4. Passing and labelling those pullets that are qualified to enter a Contest and to pass and tattoo qualified cockerels from registered matings.
5. To advise and instruct, when desired, the breeders in their pedigree breeding work.

The successful breeders realize that a settled, earnest, intelligent standard of breeding work is essential and it is remarkable how the calibre of the breeder and his work can be traced through the subsequent consistent performance of his stock in the Contests.

It has been found that the breeder, as a rule, realized that careful attention to detail in hatching and recording is essential in pedigree breeding.

There has been good demand for hatching eggs from registered stock, though there is a reluctance shown by most of the breeders to dispose of eggs, preferring rather to raise as many chicks as possible, so as to ensure a larger number of pullets from which to select their future contest entries.

During the year there were 5,247 chicks wing-banded from registered hens. Of this number about fifty per cent were cockerels and some died as baby chicks. Of the remainder 1,313 were wing labelled as suitable for Contest work and 665 were entered in the Laying Contests which are now in operation.

FIELD WORK IN QUEBEC

Under this heading are included the following activities of the division: (a) French Correspondence; (b) Investigational survey work conducted in Quebec; (c) French monthly report form service; (d) Co-operative work with other agencies; (e) Visits to the branch Farms in Quebec and Northern Ontario and (f) Visits to the Illustration Stations in Quebec.

French Correspondence

This correspondence continues to increase steadily and letters are received not only from Quebec, but also from many French-Canadians living in other provinces and in the United States. This year for the first time, a number of letters have been written by French-Canadians at present living in the Eastern States who desire to return to Canada and make poultry a main feature of their farm operations. Several letters have also come to hand from Belgians who wish to take up poultry farming in Canada.

Investigational Survey Work

As was mentioned in the report for 1923, this work is being undertaken in the districts served by the Experimental Stations at Cap Rouge, Ste. Anne de la Pocatière and La Ferme respectively.

A POLISH SETTLER'S FLOCK

A thrifty Polish settler at Amos, Abitibi, who owns the finest flock in this northern region. This settler has a splendid flock of White Leghorns and Barred Rocks, housed in two comfortable, round log buildings (31 feet by 16 feet) with glass and cotton front.

This is a plant that any poultryman would be proud to own. It is the result of grit and perseverance, for this settler is hundreds of miles from good breeding stock, ten miles from nearest village and railway station. The road from the village to his lot is very bad, the last two and a half miles being a damp, moss-covered foot-path through the woods.

Owing to the insistent demand from other poultry keepers in these districts, the number of farmers visited regularly has increased from one hundred and twenty-three to one hundred and seventy-four. By means of this work the farmers in the district are brought into direct contact with the work of the Experimental Farms, better methods of poultry keeping are introduced and much valuable data is obtained.

An interesting outcome of the work done in the Cap Rouge district, was the first Poultry Field Day held at that Station in October. Over one hundred and twenty-five poultry-keepers from a radius of fifty miles were present, of whom fully seventy-five per cent were farmers, several of whom, were visiting the Station for the first time. This field day was so successful that those present passed a unanimous vote requesting that it be made an annual event.

The most striking progress has been made in the Abitibi district (served by the Experimental Station at La Ferme) where the number of pure-bred flocks has increased from one to seventy-six, in the three years that the work has been in progress.

In order to obtain reliable information regarding the methods of handling and housing poultry upon the farms in Quebec, a preliminary survey was conducted during the year. It is hoped that this together with the information obtained through the monthly report form service will form the basis for a more comprehensive survey in the future which will provide data for thorough study of the economics of poultry keeping upon the average mixed farm.

For this preliminary survey, seventy representative farms were chosen, the majority in the districts where the regular survey work is being carried on, and the others situated in various parts of the province. In the districts where the survey work is conducted, the necessary information was obtained by personal visits, while in other cases it was gained through a mailed questionnaire.

The following summary indicates fairly accurately the conditions under which poultry is handled upon these farms:—

	Number	Per cent
Total number of farms	70	....
Average size of flock	32	....
Separate housing for poultry	59	84·3
Enclosed yards for poultry	38	54·3
Young stock wintered apart from old	49	70·0
Sexes separated during rearing period	16	22·9
Surplus stock crate fattened	32	45·7
Males separated from females in winter	21	30·0
Trap-nested flocks	12	17·1
Special birds chosen for matings	30	42·9
Hatching done by incubators	19	27·1

As will be noted, a very fair percentage of the farmers have separate housing and yards for their poultry. Only a small number, however, crate-fatten their surplus stock before marketing it, and still fewer choose their best birds for mating in the spring.

Additional features of the survey work are dealt with in the section dealing with co-operation with other agencies.

French Monthly Report form Service

This service actually supplements the work mentioned in the preceding section as it enables the farmers living in districts where no personal visits are made to obtain seasonable advice regarding their poultry problems, and at the same time to keep themselves informed as to the financial side of their poultry keeping. The details of the method followed in this work have been given in the annual reports for the past three years.

During the past year, ninety-nine farmers availed themselves of this service, and the following table covers a summary of the reports sent in both for this year and an average for the past three years:—

TABLE 30.—SUMMARY OF MONTHLY REPORTS

	1924	Three years 1922-23-24
Number of flocks	99	215 (total)
Average size of flocks	38	36
Breeds—		
Barred Rocks	36	81 (total)
Rhode Island Reds	34	68 "
White Leghorns	9	16 "
White Wyandottes	6	10 "
Chanteclers	2	6 "
Hambourgs	1	1 "
White Rocks		1 "
Mixed	11	32 "
Average production per bird	125·1	103·1
Average profit per bird	$4 99	$3 51
Average yearly feed cost per bird	3 96	2 55
Average feed cost of eggs per dozen	0 39	0 28·9
Average selling price eggs per dozen	0 52·6	0 44·3

The highest average production recorded during the year was 173 eggs per bird, and the farmer owning this flock also had the leading pen in the Eastern Quebec Contest with an average production of 200 eggs.

As will be noticed by this table, the average production, average profit per bird and average selling price of eggs, were all higher in 1924 than the average for the past three years. This gives an indication of the progress made. The increased production per bird is doubtless due to the culling that has been done, together with the introduction of male birds from high producing strains. Improved feeding methods, while they have raised the average cost of feeding a hen for a year and also the feed cost per dozen of eggs, have resulted in an increased production in winter with a consequent enhanced selling price and additional profits.

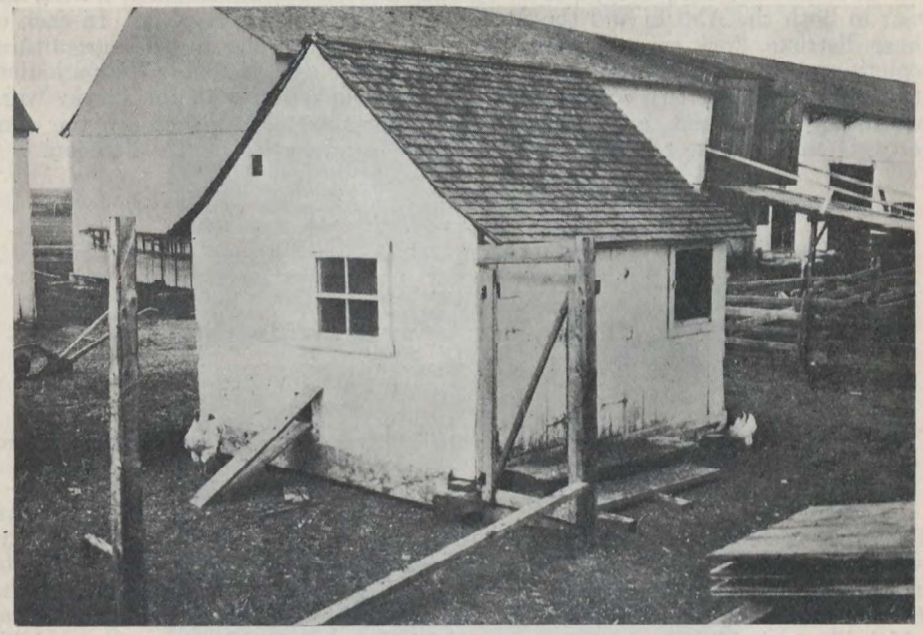
CO-OPERATION WITH OTHER AGENCIES

One of the outstanding features of the work done by this division in Quebec, is the co-operation with other agencies, both in order to prevent overlapping and duplication and also to render the peculiar work of the Experimental Farms of the greatest possible service to those agencies. Among these agencies may be mentioned the provincial poultry service and its district poultry instructors; the provincial poultry association and affiliated local associations; the agricultural colleges and the district representatives (agronomes).

Mention was made in the reports for 1922 and 1923, of the co-operative program for poultry work in Quebec. This program is still being carried on and several members of the staff of the division assisted in the giving of the annual short course connected therewith. This course held at Princeville, dealt with " Incubation and Rearing " and the total attendance at all the regular sessions was slightly over one hundred.

A member of the staff also helped with the short course on poultry judging given at the Oka Agricultural College.

By special request of the local poultry associations concerned, the division was represented at the poultry shows at Quebec, Three Rivers, Victoriaville, St-Hyacinthe, St-François du Lac, Maria, Ste-Rose, Montmagny, St-Fabien, St-Jacques and Macamic, and also at the Chantecler show held at Montreal. In each case an attractive exhibit prepared by the Division of Extension and Publicity was displayed and lectures and informal talks were given on poultry keeping in general.



THE OLD POULTRY PLANT (EASTERN QUEBEC)
Typical of poultry housing conditions in the Eastern Quebec district when the survey work was first undertaken.

The same poultry plant after several month's work and encouragement. This is the first gable-roofed farmer's poultry house in the Eastern Quebec district, and a very fine model.

A somewhat unique type of co-operative work was undertaken during the year in both the Abitibi and the Ste-Anne de la Pocatière regions. In each of these districts, flock contests were organized, in the former by the agricultural society and in the latter by the tri-county poultry association. The periodical inspection for these two contests was done in connection with the survey work previously mentioned, and the monthly reports were furnished by the contestants through the regular monthly report form service of this division.

Maximum points were given as follows:—

Quality of the flock from a breed standpoint	10
Housing—cleanliness, etc	10
Feeding and general care	20
Punctuality and accuracy *re* monthly reports	10
Economical production of eggs	15
Average production per bird	15
Improvements during the year	20
	100

In the case of the Ste. Anne district contest, fifty additional points were given for a trio of birds exhibited at the annual show.

An added feature of the Abitibi contest was a series of poultry field days. In each parish from Barraute to La Reine (ten in all) one of these field days was held, being organized by the agronomes and the parish priests. In the morning and afternoon visits were made to farmers in the district, in order to give culling demonstrations, and in the evening, public meetings were held at which illustrated lectures were given and an Experimental Farm poultry exhibit was displayed. A member of the staff of the division accompanied the agronomes, taking this exhibit with him. At some of the meetings, members of the staff of the La Ferme Experimental Station also gave lectures on the work being conducted at that station.

Judging by the reports received from the parish priests and others, this work was highly appreciated and did much to stimulate interest in poultry keeping in this newly colonized district.

VISITS TO BRANCH FARMS IN QUEBEC AND NORTHERN ONTARIO

Periodical visits are paid to the four branch Farms in Quebec and the one at Kapuskasing. The main purposes of these visits are to standardize the poultry work being carried on, particularly the experimental work and to help and advise the poultryman at each station in his general work such as special breeding, records, etc.

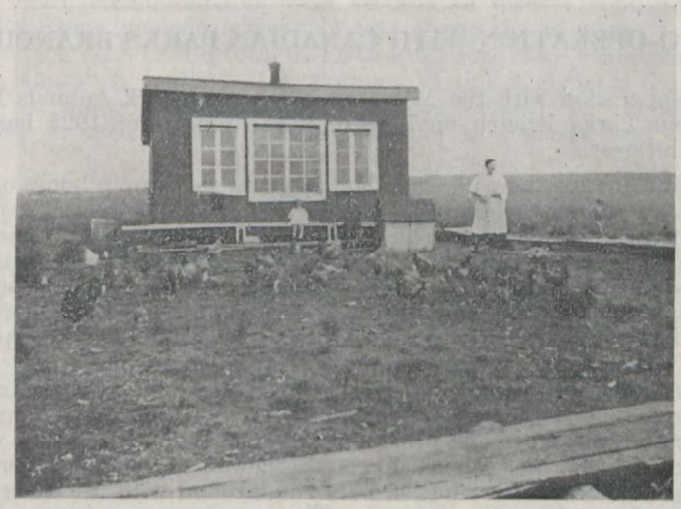
VISITS TO THE ILLUSTRATION STATIONS IN QUEBEC

At the request of Mr. J. A. Ste-Marie, Superintendent of the Experimental Station, Ste. Anne de la Pocatière, who has general oversight of the Illustration Stations in Eastern Quebec, a member of the staff visited the Stations in the lower part of that district twice, and those in the upper part once, during the year. One of these visits was made in the early autumn in order to cull the flocks on thes e Stations, and the other in the late spring to give advice regarding brooding and rearing. The supervisor of these Stations reports a decided improvement in both the flocks and the manner in which they are handled, as a direct result of the visits that have been made during the past two years.

The chief of the Division of Illustrations Stations made a request for similar visits to the stations in Western Quebec, but owing to pressure of other work it was impossible to undertake them this year.

PIONEER POULTRY HOUSE (ABITIBI)

The type of poultry house very popular in the Abitibi before 1922. Since the Poultry Division penetrated into this district, this unsanitary type of house is rapidly giving way to the better abode.



An improvement on the old house (Abitibi). Wonderful progress has been made in constructing better poultry houses in the Abitibi since 1922.

EXHIBITS

The usual exhibit work has been carried on this year in that a number of the fair associations that have asked for the poultry exhibit have received it. It is not possible to send these exhibits to all points desiring them, but the aim has been to take in as many of such points as was found feasible. In the exhibits we have come more and more to the plan of featuring one thing only; rather than have an exhibit trying to demonstrate a number of ideas, we have been content to have one idea featured in each exhibit. Judging from the favourable reports we are getting on these exhibits, they are meeting with considerable approval, and are apparently giving the information which the visitors at these exhibits are looking for.

WORK IN THE MARITIME PROVINCES AND BRITISH COLUMBIA

Mr. Morgan has continued his work among the Experimental Farms and the poultrymen of the Maritime Provinces, attending fairs, short courses, giving demonstrations, etc., as well as attending to the registration and contest inspection.

Early in the year Mr. Greenwood was appointed for similar work in the province of British Columbia, where the inspection has taken practically all of his time.

ILLUSTRATION STATIONS

As usual, this division has co-operated with the Illustration Stations throughout the Dominion, especially in the province of Quebec. In this province an officer from the division has attempted to visit, along with the Illustration Station Inspector, each of the Stations, giving first-hand information as to how the work in poultry might be improved.

Hatching eggs have also been sent to many of these Stations during the spring, and again in the fall a number of pedigree cockerels have been contributed.

CO-OPERATION WITH CANADIAN PARKS BRANCH

The co-operation with the Migratory Birds and Park Animals Division of the Canadian Parks Branch mentioned in the report for 1923 has not been without its interest.

The flight line for the wild Canada geese that we were in hopes of establishing, by way of the small lake upon which the water-fowl plant is placed, has not met with a great deal of success up to the present time. The four wild geese which were sent here by Jack Miner of Kingsville, developed their wings, as was expected, by fall, and along with them the five young geese hatched upon the plant took to the wing during the fall months, but none of them ever went very far away, even though flocks of geese returning south passed over the plant. During the spring, however, sometime in May, the four geese supplied by Mr. Miner left, and though no person witnessed their leaving it was presumed that they went north, but up to the present January 1, 1925, they have not returned. The other five are still with us, and also a " white Fronted " goose, that was winged in Saskatchewan and shipped here, this one has recovered the use of its wing and is flying around with the other wild geese that have not been clipped or jointed. The experiment is of interest, and will be continued in the hopes that some of these birds that leave may come back and bring others with them.

POULTRY DISEASES

Again we acknowledge the co-operation of the Health of Animals Branch in the disease investigation work. Dr. Weaver conducts this work at the Central Experimental Farm, where he has a small laboratory and hospital accommodation. This year he visited, in company with the Dominion Poultry Husbandman, the farms in the Maritime Provinces, for the purpose of obtaining first-hand information concerning the health of the Experimental Farm flocks, and also others throughout the section, as far as this was possible.

The following report for the year 1924 is written by Dr. Weaver:—

The policy for the year's work has been a continuation of that of the previous corresponding period. Practical usefulness has been maintained as the centre about which all undertakings should be arranged, and to that end a relatively large proportion of time has been devoted to the application of known principles. The results obtained have justified this course.

Particularly gratifying are the results accruing from the survey work, previously instituted and still continued, of the stock, the yards and equipment. This work has been extended to include some of the branch Farms.

Very close co-operation has been given to the development of practical means for the control and eradication of worm infestation. By this, the object has been to break the life cycle of the worms thus rendering impossible the propagation of the parasites. The chief innovation, to this end, has been a radical change in handling and arranging the yards and runs, and a control of the movements of the stock. The results thus far have been very satisfactory and warrant a continuation of the policy.

Hospital services have been continued for the Contest and plant. It was, however, maintained with considerable difficulty, due to lack of accommodation. This part of the work has been reduced by a continuation of medicinal prophylaxis to contacts in pens where contagion has appeared.

Autopsy and laboratory services for the determination of cause of death or nature of illness on specimens from private sources, the plant and the Contests have been given as heretofore. A considerable increase is shown in this section. The increase is not considered as being due entirely to an increased prevalence of disease in the country, but rather that poultrymen are each year becoming more communicative with respect to disease conditions. Nevertheless, the Roup incidence evidently was above the average.

During the year 1924 a total of 1,013 specimens were examined by autopsy and other laboratory methods. A summary of this is given in the accompanying table 31, under the various diseases encountered, by monthly number, annual total of each disease, monthly total of all diseases, and the final sum total.

TABLE 31.—AUTOPSY REPORT FOR THE YEAR 1924

—	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Total
Roup and Chicken Pox	....	....	1	1	5	8	2	1	2	....	....	....	20
Roup only	2	11	20	31	23	46	79	21	12	7	1	6	259
Pox only	....	....	2	1	1	3	1	....	....	....	....	....	8
Diseases incident to egg production	4	5	2	5	10	7	11	3	5	4	....	3	59
Hemorrhage	7	4	2	6	4	10	13	5	6	7	3	5	72
Peritonitis	2	6	6	3	11	5	8	10	5	5	5	....	66
Paralysis or blindness or both	....	6	1	5	....	3	12	5	4	5	2	3	46
Parasitism—intestinal	1	9	15	31	19	9	2	7	19	6	6	5	129
Distended Burse of Fabricus	....	....	2	1	1	....	3	1	....	....	....	....	8
Tuberculosis	2	1	2	1	1	4	4	3	....	5	1	1	25
Luckemia	2	1	....	....	....	2	3	6	1	2	2	....	19
Vent Gleet	1	....	....	....	....	1	2	2	2	1	....	1	10
Tumor	....	....	....	5	....	4	1	....	4	....	1	....	15
Pneumonia	1	....	....	....	....	....	....	....	....	....	....	....	1
Heat prostration	....	....	....	....	....	....	1	....	....	....	....	....	1
Cannibalism	....	1	2	....	3	7	10	7	5	4	3	6	48
Visceralgout	....	3	....	....	3	2	5	1	3	2	4	1	24
Avitamosis	....	2	....	1	6	1	4	....	....	....	5	7	26
Digestive and liver trouble	3	3	5	3	....	1	1	1	1	1	....	....	19
No apparent cause, and decomposed specimens	4	2	9	3	4	3	8	2	4	5	2	4	50
Prolapsus	1	1	....	....	....	....	1	1	....	....	....	....	4
Percarditis	1	1	1	....	1	1	1	2	1	1	....	....	10
Sepsis—Non-specific	....	....	12	24	....	....	....	....	....	....	....	....	36
Miscellaneous	3	4	1	1	3	5	8	13	10	2	1	5	58
Totals	36	60	83	122	95	122	180	91	84	57	36	47	1013

Roup again takes the first place in point of numbers with 259 cases, and an additional 20 where it acted as a complication to other disease, making a total of 279 or 27.5 per cent of all specimens. Better methods of diagnosis through increased knowledge, the result of research, have added somewhat to the number appearing under this listing as compared with former summaries. May is the high month with respect to Roup, having 30 per cent of the total number affected with this disease.

Intestinal parasitism again records the second largest number of autopsies with 129, or 12.7 per cent of the total. The peak is in February, giving 24 per cent of the annual number.

Tuberculosis stands relatively low among the specific diseases with 25 specimens, or 2.4 per cent of the total.

Some specimens were received that were unsuitable for laboratory examination, usually as a result of decomposition. A few also came to hand lacking identification markings, thus leaving us without means of communicating the laboratory findings to the sender.

The accompanying graph covers the course of the disease, Roup, for the years 1923-24, as taken from the hospital records. Periods of prevalence and the opposite condition were almost identical in 1924 with that of the previous year, although the high peaks and total number of cases were materially reduced. The seasonal nature of Roup is again emphasized. It was common in the winter, reaching a maximum in the spring and fall and disappearing in the summer. Two months, August and September, gave no cases.

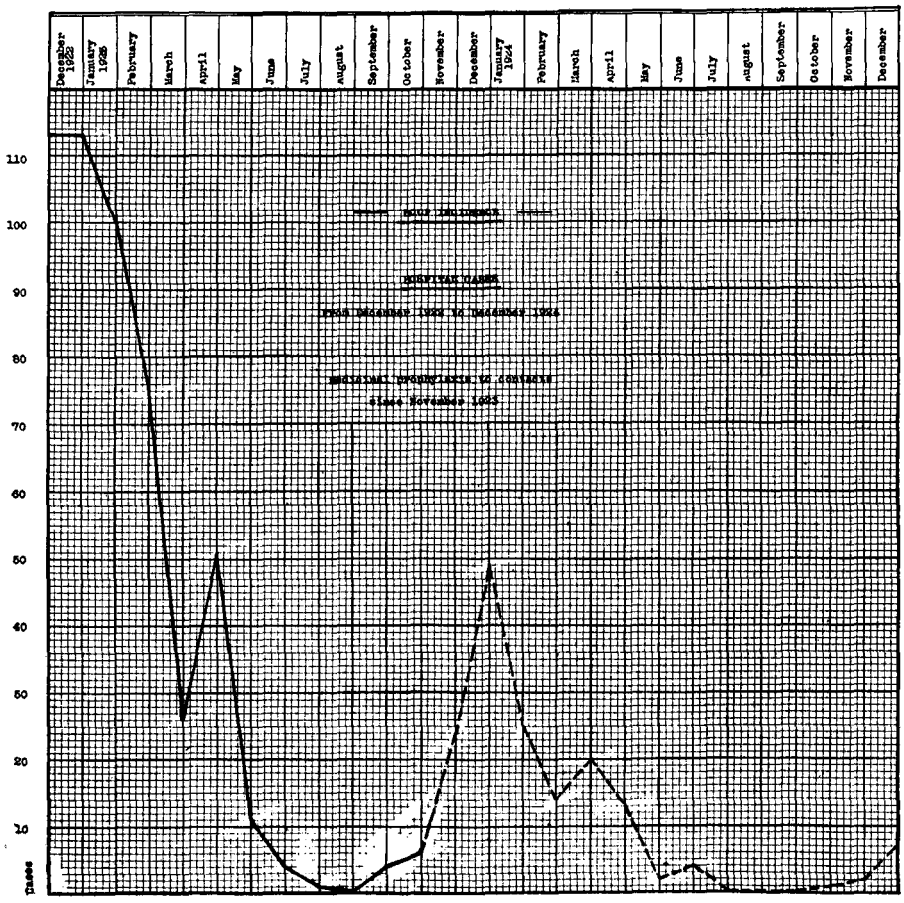
As a contribution to the knowledge of Roup, from the standpoint of economic importance, the accompanying graph is given entitled "The economic importance of Roup."

A pen of Single-Comb White Leghorn pullets of a given strain, was divided into two pens on November 22, and are designated pens A and B. By the end of the month roup made its appearance in pen A and increased in virulence throughout the month of December. It remained at its height during the following two months, and subsided again in March. Pen B remained free of the disease.

There is a marked difference in the production values of these two pens accountable for only by the presence of roup in the one pen and absence of the disease in the other. Egg values for pen A per bird for the three months of December, January and February equal 70 cents. Pen B egg values per bird for the corresponding period total $2.50, or a difference in favour of the latter of $1.80. For the six winter months the production values are $3.12 and $5.38 respectively, or a difference of $2.26 per bird in favour of pen B.

The hospital cared for 232 patients, and grouped under four main headings they were as follows:—

Roup only	93
Roup and Pox	8
Pox only	15
Other causes	116
Total	232



This gives a total reduction in hospital cases of 50 per cent over the preceding year, confined to cases of a communicable nature. Sporadic diseases gave a slight increase in number.


NOVEMBER
DECEMBER
JANUARY
FEBRUARY
MARCH
APRIL
A
B
$1.00
.90
.80
.70
.60
.50
.40
.30
.20
.10
ECONOMIC IMPORTANCE OF ROUP
Value of eggs per bird based on
current prices at Ottawa
Per A - Affected with Roup
Per B - Free from Roup

Investigational work on Roup was continued along lines suggested by the results of the previous year's work, and while limited in extent by the available physical equipment and time factor, nevertheless, continued to add to the present understanding of the disease.

The results of this work have been published as a technical article, a limited number of reprints being available for distribution.

Controlled experiments on several immunizing agents are under way, but will not be terminated until well into the succeeding year.

It was also necessary to make some studies relative to para-typhoid intections in fowl, for the purpose of supplying definite information on the disease itself rather than its prevalence in the country.

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