

Poultry  
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# REPLACEMENT PULLET COSTS 1964



AGRICULTURAL EXTENSION SERVICE    UNIVERSITY OF CALIFORNIA    IN ORANGE COUNTY

## INTRODUCTION

Replacements currently represent 25-30 per cent of the total annual expenditure on typical southern California egg ranches. Together with feed they represent over 80 per cent of all costs involved with producing a dozen eggs.

In 1958 and 1959 a study was made in Orange County involving 31 separate flocks to determine the cost of producing a 16 week old pullet. At that time, 16 weeks was the typical age for started pullets in the area. During the past five years, we have seen many changes which could result in different pullet costs. It has also become a common practice to purchase pullets at older ages.

In the spring of 1964 ten typical Orange County egg ranches were selected to keep track of all costs involved with raising pullets to 16, 20, and 24 weeks of age. Three ranches kept their records to 16 weeks, four to 20 weeks, and three to 24 weeks. The 16 and 20 week records were projected ahead to 24 weeks based on their results at 16 weeks. A total of 37,782 pullets were started on the ten ranches representing hatch dates from March through June 1964.

## DEFINITIONS

Per Pullet - Total costs divided by number of pullets alive at that age.

Chick Cost - Total cost of chicks divided by the number of chicks delivered including extras.

Vaccine and Vaccination Costs - Combined vaccinations or ready-mixed vaccines were divided equally in terms of cost and/or labor.

Depreciation - Original cost divided by ten years and divided by the number of broods per year.

Interest - One-half of the new value for buildings divided by the number of broods per year @ 6 per cent plus an average investment of 80 cents per pullet for 24 weeks @ 6 per cent plus a standard cost for the use of the land.

Labor Costs - All labor was calculated at \$1.50 per hour.

## SIZE OF RANCHES

A - 10-20,000 Hens

B - 20-50,000 Hens

C - over 50,000 Hens

DESCRIPTION OF RANCHES

Ranch No. and Size	Type of Brooders	Brooding Frequency	Brood Size	Hatch Date	Chick Cost	Debeaking Age	MOVE		% Production @ 24 Weeks
							To Grow	To Lay	
1-B	Hot water	8 Weeks	2500	March	36.7¢	17 Weeks	6 Weeks	20 Weeks	38.2%
2-A	Hot water	7½	1700	March	30.2	21	7½	21	50.0
3-A	Sunshine	10	1100	April	37.6	17	7	20	29.9
4-A	Hot water	10	2400	May	30.9	14	7	26	37.1
5-A	Sunshine	7	1400	May	30.8	16	6	20	31.2
6-A	Sunshine	9	2000	May	27.6	16	6½	23	18.5
7-B	Hot water	8	4700	April	31.7	1+14	7	20	0.5
8-C	Floor	17	12700	March	27.3	18	10	20	6.6
9-B	Hot water	8	5200	May	24.0	16	5½	13	10.0
10-B	Hot water & Sunshine	10	6100	June	26.9	16	5½	22	9.9
Average	--	9½	3980	--	30.4¢	16½	6½	20½	23.2%

TABLE NO. 1

Nine out of ten of these ranches raised their pullets on wire. They were all multiple age group ranches replacing 5-6 times per year. Extreme variations were noted in the rate of maturity ranging from almost zero to 50 per cent at 24 weeks. Ranch No. 7 intentionally slowed his birds down with the use of a low-density feed feeding program.

There has been no attempt to correlate any of the factors studied with subsequent performance. These pullets, as a rule, will be housed in two and three bird cages and will go on to produce at an annual hen-day rate of 65-70 per cent.

Three of the ranches followed a "step-down, step-up" lighting program while the remainder gave their pullets natural light only until 20-22 weeks of age. At this time of the year, the non-lighted birds were on a natural step-down program.

IMMUNIZATION PROGRAM

Ranch No.	Fowl Pox	Newcastle Disease	Infectious Bronchitis	Laryngo-tracheitis	Infectious Coryza	Fowl Cholera
1	Wing-web 3 day	Intra-muscular 3 week & 12 week	Water - 10 day Intra-ocular - 14 week	Brush 8 week	Intra-muscular 4 week & 11 week	--
2	Wing-web 18 week	Intra-muscular ** 3½ week & 12 week	Water 12 day & 15½ week	Brush 6 week Intra-ocular 11 week	Intra-muscular ** *3½ week & 12 week	Intra-muscular *3½ week & 12 week **
3	Wing-web 1 day	Intra-ocular ** 3 week & 12 week	Intra-ocular ** 3 week & 12 week	Brush 4 week Intra-ocular ** 16 week	Intra-muscular 6 week *	Intra-muscular 6 week * & 16 week **
4	--	Intra-ocular 3½ week Wing-web - 15 week	Intra-ocular - 11 week	Brush 7 week	Intra-muscular 17 week	--
5	Wing-web 8 day	Intra-ocular 3 week ** 16 week	Intra-ocular - 9 week	Brush 3 week ** Intra-ocular 12 week	Intra-muscular 4 week *	Intra-muscular 4 week * 10 week
6	Wing-web 18 week	Intra-muscular 3 week & 12 week	Water - 10 day Intra-ocular - 14 week	Brush 8 week	Intra-muscular 3 week *	Intra-muscular 3 week *
7	Wing-web 18 week	Intra-muscular 3 week ** 12 week	Water - 8 day Intra-ocular - 14 week	Brush 8 week	Intra-muscular 3 week **	--
8	Wing-web 10 week **	Water - 10 day* Intra-ocular 4 week Intra-muscular 18 week	Water - 10 day * Intra-ocular - 14 week	Brush 10 week **	Intra-muscular 20 week	--
9	Wing-web 1 week	Intra-ocular 4 week & 14 week	Water - 2 week & 12 week	Brush 7 week	Intra-muscular 3 week *	Intra-muscular 3 week *
10	Wing-web 1 week	Intra-ocular 4 week & 14 week	Water - 2 week & 12 week	Brush 7 week	Intra-muscular 3 week	--

\* - Mixed

\*\* - Administered at the same time

TABLE NO. 2

VACCINE AND VACCINATION COSTS PER 24 WEEK OLD PULLET  
(Complete Immunization Program)

		1	2	3	4	5	6	7	8	9	10	Av.
Fowl Pox	Vaccine	.23¢	.34¢	.21¢	--	.15¢	.35¢	.47¢	.18¢	.67¢	.52¢	.31¢
	Labor	.25	.36	.41	--	.43	.63	.36	.21	.48	.39	.35
Newcastle Disease	Vaccine	2.44	2.34	.63	.73	.27	2.32	.99	.85	.60	.46	1.16
	Labor	.63	.39	.55	.93	.80	.71	.50	.70	1.04	.77	.71
Infectious Bronchitis	Vaccine	.46	.46	.42	.25	.15	.59	.45	.49	.60	.46	.43
	Labor	.63	.09	.55	.64	.43	.45	.67	.44	.06	.05	.40
Laryngo-tracheitis	Vaccine	.50	1.08	1.08	.68	.82	.56	.59	.46	.93	.77	.75
	Labor	.63	.36	1.38	.64	.80	1.25	.57	.21	1.80	1.24	.89
Infectious Coryza	Vaccine	3.75	2.10	2.06	2.05	2.21	1.19	3.93	1.85	1.60	2.42	2.32
	Labor	.63	.39	.41	.39	.32	.36	.28	.32	.24	.39	.37
Fowl Cholera	Vaccine	--	2.10	2.06	--	2.21	1.19	--	--	1.60	--	.92
	Labor	--	.39	.41	--	.43	.36	--	--	.24	--	.18
Total	Vaccine	7.38¢	8.42¢	6.46¢	3.71¢	5.81¢	6.20¢	6.43¢	3.83¢	6.00¢	4.63¢	5.89¢
	Labor	2.77	1.98	3.71	2.60	3.21	3.76¢	2.38	1.88	3.86	2.84	2.90
TOTAL COST OF PROGRAM		10.15¢	10.41¢	10.17¢	6.31¢	9.02¢	9.96¢	8.81¢	5.71¢	9.86¢	7.47¢	8.79¢

TABLE NO. 3

Table No. 3 indicates the costs which these ten ranches incurred in immunizing their pullets. The success of these programs cannot be evaluated, but undoubtedly it ranges from only fair immunity to excessive vaccination for any one particular disease.

Actual costs per pullet at the time of vaccination would be slightly less than the figures shown above because of more pullets at the time. These figures reflect total losses to 24 weeks. A previous study conducted in 1962 indicated the following vaccination rates:

1. Wing-web - 465 per man-hour
2. Intra-ocular - 349 per man-hour
3. Vent brush - 214 per man-hour
4. Water - 2610 per man-hour
5. Intra-muscular - 356 per man-hour

FEEDING PROGRAM (To 24 Weeks)

Ranch No.	Starter				Grower				Layer				Total			
	Wks.	Lbs.	Average Cost	Total Cost	Wks.	Lbs.	Average Cost	Total Cost	Wks.	Lbs.	Average Cost	Total Cost	Wks.	Lbs.	Average Cost	Total Cost
1	7	3.63	\$4.27	15.5¢	17	18.47	\$3.30	61.0¢	--	--	--	--	24	22.10	\$3.46	76.5¢
2	6	3.18	4.26	13.6	14	13.41	3.23	43.3	4	5.52	\$2.99	16.5¢	24	22.11	3.32	73.4
3	8	4.40	4.33	19.1	12	10.08	3.84	38.7	4	4.04	2.90	11.7	24	18.52	3.75	69.5
4	8	4.87	4.15	20.2	16	18.33	3.25	59.5	--	--	--	--	24	23.20	3.44	79.7
5	7	3.56	4.18	14.9	13	13.04	3.30	43.0	4	4.65	3.25	15.1	24	21.25	3.44	73.0
6	8	2.39	4.00	9.6	12	13.18	3.49	46.0	4	4.01	3.25	13.0	24	19.58	3.50	68.6
7	7	3.80	4.25	16.1	17	20.21	3.30	66.8	--	--	--	--	24	24.01	3.45	82.9
8	8	4.27	4.28	18.3	12	13.68	3.49	47.8	4	5.05	3.11	15.7	24	23.00	3.56	81.8
9	6½	4.02	4.40	17.7	10	14.43	3.28	47.4	7½	10.56	3.00	31.7	24	29.01	3.34	96.8
10	6½	2.74	4.40	12.0	10	11.14	3.28	36.6	7½	10.06	3.00	30.2	24	23.94	3.29	78.8
Average	7.2	3.69 lbs.	\$4.25	15.7¢	13.3	14.59 lbs.	\$3.38	49.0¢	3.5	4.39 lbs.	\$3.07	13.4¢	24	22.67 lbs.	\$3.45	78.1¢

TABLE NO. 4

The feeding programs used by these ranches varied considerably. In general, the chicks were started on a 20-24 per cent protein feed for 6-8 weeks. This was followed by 10-17 weeks of various types of grower rations. These varied from 14 per cent to 18 per cent protein. In some cases, the 14 per cent ration was fed for the entire period while other ranches fed an 18 per cent ration for the same period. Two ranches used the 14 per cent ration just prior to the onset of lay in order to delay production. All but two of the ranches placed their pullets on an 18 per cent layer ration at 20-24 weeks of age.

It should be noted that the National Research Council recommends at least 20 per cent crude protein in rations up until the birds reach 1.5 pounds or in the case of this particular study until at least 8 weeks of age.

FEED CONSUMPTION PER PULLET TO 16, 20, and 24 WEEKS OF AGE

Ranch No.	16 Weeks	20 Weeks	24 Weeks
1	12.95 lbs.	18.00 lbs.	22.10 lbs.
2	13.28	18.33	22.11
3	10.34	14.35	18.52
4	13.57	18.39	23.20
5	11.98	16.44	21.25
6	10.89	15.04	19.58
7	13.89	19.49	24.01
8	13.00	17.91	23.00
9	14.45	21.58	29.01
10	13.64	18.71	23.94
Average	12.80 lbs.	17.82 lbs.	22.67 lbs.

TABLE NO. 5

Feed consumption rates are quite close to published figures from various parts of the country. One set of such data indicates expected feed consumption to 16 weeks should be 12.40 and 20 weeks should be 17.22. Our results were approximately one-half pound higher.

PULLET WEIGHTS AT SELECTED AGES

Ranch No.	8 Weeks	16 Weeks	20 Weeks	24 Weeks
1	1.41 lbs.	2.74 lbs.	3.10 lbs.	3.68 lbs.
2	1.63	2.96	3.42	4.00
3	1.39	2.59	3.08	3.75
4	1.63	2.79	3.30	3.67
5	1.38	2.59	2.58	3.39
6	1.31	2.63	2.71	3.36
7	1.38	2.82	3.10	3.43
8	1.25	2.34	2.59	3.07
9	1.46	2.81	3.12	3.60
10	1.33	2.79	3.06	3.60
Average	1.42 lbs.	2.71 lbs.	3.01 lbs.	3.56 lbs.

TABLE NO. 6

Nine different strains of white leghorns were included in this study. Some ranches had two separate strains. The average body weights compared favorably with published data representing typical weights. Some individual groups of pullets on the other hand did not reach the expected weights for their strain. Pullets which are one-quarter to one-half pound light at 24 weeks of age will generally not perform up to the standard for that particular strain.

LABOR REQUIREMENTS PER PULLET TO 16, 20, and 24 WEEKS OF AGE

16 Weeks

Ranch No.	Vaccination	Debeaking	Feeding	Moving	Other	Total
1	1.09 min.	0 min.	.62 min.	.15 min.	.24 min.	2.10 min.
2	.64	0	1.29	.14	.46	2.53
3	1.47	0	1.05	.16	.76	3.44
4	.88	.36	1.30	.51	.92	3.97
5	1.26	.29	2.35	.13	.63	4.66
6	1.43	.27	1.12	.17	.17	3.16
7	.92	0	1.01	.14	.12	2.19
8	.45	0	.54	.10	.52	1.61
9	1.22	.25	.34	.46	.23	2.50
10	1.11	.30	.81	.15	.16	2.53
Average	1.05	.15	1.04	.21	.42	2.87
	37%	5%	36%	7%	15%	

TABLE NO. 7

20 Weeks

Ranch No.	Vaccination	Debeaking	Feeding	Moving	Other	Total
1	1.09 min.	.25 min.	.72 min.	.15 min.	.24 min.	2.45 min.
2	.79	0	1.40	.14	.47	2.80
3	1.47	.44	1.43	.16	.77	4.27
4	1.04	.36	1.49	.51	.92	4.32
5	1.26	.30	2.95	.13	.63	5.27
6	1.45	.28	1.27	.17	.17	3.34
7	.94	.28	1.23	.42	.13	3.00
8	.74	.30	.83	.35	.53	2.75
9	1.40	.29	.47	.53	.23	2.92
10	1.12	.31	.93	.15	.16	2.67
Average	1.13	.28	1.27	.27	.43	3.38
	33%	8%	38%	8%	13%	

TABLE NO. 8

24 Weeks

Ranch No.	Vaccination	Debeaking	Feeding	Moving	Other	Total
1	1.10 min.	.25 min.	.81 min.	.23 min.	.26 min.	2.65 min.
2	.80	.32	1.66	.32	.85	3.95
3	1.48	.44	1.53	.26	.85	4.56
4	1.04	.36	1.67	.51	1.36	4.94
5	1.28	.30	3.11	.13	.72	5.54
6	1.50	.29	1.46	.36	.25	3.86
7	.95	.28	1.30	.43	.17	3.13
8	.75	.31	.91	.36	.55	2.88
9	1.54	.32	.59	.59	.31	3.35
10	1.14	.31	1.07	.46	.17	3.15
Average	1.16	.32	1.41	.37	.55	3.81
	30%	8%	37%	10%	15%	

TABLE NO. 9



LABOR COSTS PER PULLET TO 16, 20, and 24 WEEKS OF AGE  
(at \$1.50 per hour)

16 Weeks

Ranch No.	Vaccine	Debeaking	Feeding	Moving	Other	Total
1	2.73¢	--	1.55¢	.38¢	.60¢	5.25¢
2	1.60	--	3.23	.35	1.15	6.33
3	3.68	--	2.63	.40	1.90	8.60
4	2.20	.90¢	3.25	1.28	2.30	9.93
5	3.15	.73	5.88	.33	1.58	11.65
6	3.58	.68	2.80	.43	.43	7.90
7	2.30	--	2.53	.35	.30	5.48
8	1.13	--	1.35	.25	1.30	4.03
9	3.05	.63	.85	1.15	.58	6.25
10	2.78	.75	2.03	.38	.40	6.33
Average	2.63¢	.38¢	2.60¢	.53¢	1.05¢	7.19¢

TABLE NO. 10

20 Weeks

Ranch No.	Vaccine	Debeaking	Feeding	Moving	Other	Total
1	2.73¢	.63¢	1.80¢	.38¢	.60¢	6.13¢
2	1.98	--	3.50	.35	1.18	7.00
3	3.68	1.10	3.58	.40	1.93	10.68
4	2.60	.90	3.73	1.28	2.30	10.80
5	3.15	.75	7.38	.33	1.58	13.18
6	3.63	.70	3.18	.43	.43	8.35
7	2.35	.70	3.08	1.05	.33	7.50
8	1.85	.75	2.08	.88	1.33	6.88
9	3.50	.73	1.18	1.33	.58	7.30
10	2.80	.78	2.33	.38	.40	6.68
Average	2.83¢	.70¢	3.18¢	.68	1.08¢	8.47¢

TABLE NO. 11

24 Weeks

Ranch No.	Vaccine	Debeaking	Feeding	Moving	Other	Total
1	2.77¢	.63¢	2.03¢	.58¢	.65¢	6.63¢
2	1.99	.80	4.15	.80	2.13	9.88
3	3.71	1.10	3.83	.65	2.13	11.40
4	2.60	.90	4.18	1.28	3.38	12.35
5	3.21	.75	7.78	.33	1.80	13.85
6	3.75	.73	3.65	.90	.63	9.65
7	2.38	.70	3.25	1.08	.43	7.83
8	1.88	.78	2.28	.90	1.38	7.20
9	3.86	.80	1.48	1.48	.78	8.38
10	2.84	.78	2.68	1.15	.43	7.88
Average	2.90¢	.80¢	3.53¢	.93¢	1.38¢	9.54¢

TABLE NO. 12

COSTS OF 16-20-24 WEEK-OLD PULLETS

16 Weeks

Ranch No.	Feed	Chicks	Fuel	Medi-cation	Vaccine	Labor	Misc.	Depr.	Int.	Total Cost	In-come	Net Cost
1	46.4¢	37.8¢	1.0¢	--	7.3¢	5.2¢	.4¢	3.7¢	4.3¢	\$1.06	--	\$1.06
2	45.7	31.0	.6	.9¢	8.0	6.4	.6	5.4	4.7	1.03	--	1.03
3	38.8	38.1	.5	4.8	6.4	8.6	.5	2.7	4.6	1.05	--	1.05
4	50.2	31.9	.2	--	1.6	10.6	.8	5.4	4.5	1.05	--	1.05
5	42.6	31.3	.7	.4	5.7	11.6	.4	4.2	5.0	1.02	--	1.02
6	39.6	31.1	.6	1.3	5.7	7.9	.3	5.1	5.0	.97	--	.97
7	51.9	33.9	.5	--	5.8	6.2	.2	5.0	4.2	1.08	--	1.08
8	47.9	29.1	.4	5.3	1.7	4.0	.2	2.5	3.8	.95	--	.95
9	51.0	26.1	.6	--	4.7	6.2	.2	7.4	5.1	1.01	--	1.01
10	47.8	27.9	.5	--	4.6	6.3	.2	3.0	4.7	.95	--	.95
Av.	46.2¢	31.8¢	.6¢	1.3¢	5.2¢	7.3¢	.4¢	4.4¢	4.6¢	\$1.02	--	\$1.02

TABLE NO. 13

20 Weeks

Ranch No.	Feed	Chicks	Fuel	Medi-cation	Vaccine	Labor	Misc.	Depr.	Int.	Total Cost	In-come	Net Cost
1	63.0¢	37.9¢	1.0¢	--	7.3¢	6.1¢	.4¢	3.7¢	4.3¢	\$1.24	--	\$1.24
2	61.3	31.1	.6	.9¢	8.4	7.0	.6	5.4	4.7	1.20	--	1.20
3	52.5	38.2	.5	4.8	6.4	10.6	.5	2.7	4.6	1.21	--	1.21
4	65.0	32.0	.2	--	3.7	11.5	.9	5.4	4.6	1.23	--	1.23
5	57.4	31.5	.7	.4	5.8	13.2	.4	4.2	5.1	1.19	--	1.19
6	53.7	31.6	.6	1.3	6.1	8.4	.3	5.1	5.1	1.12	--	1.12
7	70.0	34.7	.5	--	6.4	7.5	.2	5.1	4.3	1.29	--	1.29
8	65.1	29.3	.4	5.3	3.8	6.9	.2	2.5	3.8	1.17	--	1.17
9	73.5	30.0	.7	--	5.4	7.3	.2	8.5	5.9	1.32	--	1.32
10	63.0	28.0	.5	--	4.6	6.7	.2	3.0	4.8	1.11	--	1.11
Av.	62.5¢	32.4¢	.6¢	1.3¢	5.8¢	8.5¢	.4¢	4.6¢	4.7¢	\$1.21	--	\$1.21

TABLE NO. 14

24 Weeks

Ranch No.	Feed	Chicks	Fuel	Medi-cation	Vaccine	Labor	Misc.	Depr.	Int.	Total Cost	In-come	Net Cost
1	76.5¢	38.2¢	1.0¢	--	7.4¢	6.6¢	.4¢	3.8¢	4.4¢	\$1.38	5.8¢	\$1.33
2	73.4	31.2	.6	.9¢	8.4	9.9	.6	5.4	4.8	1.35	11.9	1.23
3	69.5	38.5	.5	4.9	6.5	11.4	.5	2.8	4.6	1.39	5.4	1.34
4	79.7	32.0	.2	--	3.7	12.4	.9	5.4	4.6	1.39	9.1	1.30
5	73.0	31.8	.7	.4	5.8	13.8	.4	4.2	5.1	1.35	4.5	1.31
6	68.6	32.7	.6	1.4	6.3	9.6	.3	5.3	5.3	1.30	2.2	1.28
7	82.9	35.2	.5	--	6.4	7.8	.2	5.2	4.4	1.43	.9	1.42
8	81.8	29.7	.4	5.4	3.8	7.2	.2	2.6	3.9	1.35	1.0	1.34
9	96.8	33.4	.8	--	6.0	8.4	.3	9.4	6.5	1.62	1.1	1.61
10	78.8	28.3	.5	--	4.6	7.9	.2	3.1	4.8	1.28	.9	1.27
Av.	78.1¢	33.1¢	.6¢	1.3¢	5.9¢	9.5¢	.4¢	4.7¢	4.8¢	\$1.38	4.3¢	\$1.34

TABLE NO. 15

MORTALITY TO 16, 20, and 24 WEEKS OF AGE

Ranch No.	To 16 Weeks	To 20 Weeks	To 24 Weeks
1	3.0%	3.3%	3.8%
2	2.5	2.8	3.2
3	1.4	1.6	2.5
4	3.2	3.5	3.6
5	1.8	2.3	3.2
6	11.4	12.7	15.7
7	6.3	8.5	9.7
8	6.2	6.9	8.3
9	7.9	19.8	27.9'
10	3.5	3.9	5.1
Average	4.7%	6.5%	8.3%

TABLE NO. 16

SUMMARY

This study indicates that egg producers in southern California should be able to raise 16 week old pullets for 95 cents to \$1.10; 20 weeks old pullets for \$1.10 to \$1.30; and 24 week old pullets for \$1.30 to \$1.40. The cost at 24 weeks would depend on the amount of eggs they produce.

The 1958 (Summer) Study in Orange County showed a 16 week cost of approximately \$1.04 which would indicate very little if any improvement in costs. Some of the pertinent comparisons are shown below:

<u>1958 (Summer)</u>	<u>Trait</u>	<u>1964 (Summer)</u>
\$1.04	Cost	\$1.02
6.4%	% Loss	4.7%
12.43 lbs.	Feed Consumed	12.80 lbs.
\$3.94	Feed Price	\$3.63
2.76 lbs.	Pullet Weight	2.71 lbs.

The most significant differences between the two studies would be lower priced feed, more vaccine costs, and less labor per pullet.

"Raising pullets for the least money should not be your goal, but rather to raise the best pullets for the least money. Good care costs money -- your aim should be to maintain this good care while lessening wasteful costs."

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