SHAVER

THE MONEY MAKER

SHAVER BROWN

UK MANAGEMENT GUIDE 2026

Achieving the full genetic potential of the Shaver Brown

THE SHAVER STORY

Born in Canada in 1920 of Scottish/German descent, Donald McQueen Shaver was given two hens by a Great Aunt and he sold their eggs in the local market. Subsequently he acquired two lines of Leghorns from Washington.

Returning from active service in the spring of 1946 he had to search for new stock and initially he collected White Leghorns, Rhode Island Reds and Barred Rocks. One early cross, involving four strains, two strain crosses and 30 reciprocal crosses yielded 290 eggs. The success of this cross led to a period of rapid expansion for Donald who went on to become a pioneer of poultry breeding and a highly successful businessman.

THE SHAVER TODAY

The Money Maker

The Shaver Brown is a highly efficient and balanced brown egg layer, producing a large volume of eggs with strong shells and good internal quality.

The Shaver Brown has a low feed intake combined with a high peak production and great laying persistency. The Shaver Brown is a reliable, efficient and profitable bird for all egg producers.

- **Efficient and profitable**
- **Consistent shell colour and quality**
- **An adaptable all rounder**

CAREFUL MANAGEMENT - THE KEY TO SUCCESS

The purpose of this management guide is to help the producer to gain the best possible results for their investment. This will be achieved by providing conditions in which the Shaver Brown can thrive. The information supplied in this publication is based on the analysis of extensive research and field results, produced over time and with many years of experience.

We do recognise that, over time, many egg producers have developed their own management programmes, based on specific housing types, feed, market conditions, and other factors. These individual management techniques will also be the results of experience, and may also work well for the Shaver Brown. Therefore, do not hesitate to use your own experience in conjunction with the guidelines in this publication – and, of course, do not hesitate to consult your Joice and Hill representative who will be happy to help in any way they can.

SHAVER

PERFORMANCE

Performance summary

Rearing Period (0 -16 weeks)

Liveability (%)	98
Body weight at 5 weeks (g)	340
Body weight at 16 weeks (g)	1350
Feed Consumption per bird 0-16 weeks (kg)	5.5

Laying Period (16-80 weeks) - UK Colony

Age at 50% production (days)	143
Peak production HD (%)	94.9
Liveability (16-80 weeks) (%)	95.2
Body weight at 80 weeks (g)	1961

Feed consumption in maturity (20 weeks on)

Per bird per day (g) 20-80 weeks	114.5

UK Colony	Age in weeks		
	70	80	90
No. eggs per Hen Housed	322	380	433
Average egg weight (g)	63.4	63.7	63.9
Egg mass HH (kg)	20.4	24.1	27.7
Feed conversion	2.0	2.0	2.0
Liveability	96.0	95.2	94.5

Performance summary UK Free Range

Laying Period (16-80 weeks) - UK Free Range

Age at 50% production (days)	153
Peak production HD (%)	94.3
Liveability (16-80 weeks) (%)	94.3
Body weight at 80 weeks (g)	1961

Feed consumption in maturity (20 weeks on)

Per bird per day (g) 20-80 weeks	124.1

UK Free Range	Age in weeks		
	70	80	90
No. eggs per Hen Housed	311	369	422
Average egg weight (g)	63.6	63.9	64.1
Egg mass HH (kg)	19.8	23.6	27.1
Feed conversion	2.2	2.2	2.2
Liveability	95.2	94.3	93.4

Performance data rearing period

Do not change until body weight has been achieved.

Age (weeks)	Age (days)	Type of feed	Feed intake (g/day)	Cumulative feed intake (kg)	Body weight target (g)
1	0 → 7	Super Chick	11	0.1	60
2	8 → 14		17	0.2	120
3	15 → 21		25	0.4	175
4	22 → 28	Chick	32	0.6	245
5	29 → 35		37	0.9	340
6	36 → 42		42	1.1	440
7	43 → 49		46	1.5	540
8	50 → 56		50	1.8	630
9	57 → 63		54	2.2	720
10	64 → 70	Grower	58	2.6	810
11	71 → 77		61	3.0	900
12	78 → 84		64	3.5	1000
13	85 → 91		67	3.9	1095
14	92 → 98		70	4.4	1180
15	99 → 105		73	4.9	1265
16	106 → 112		77	5.5	1350
17	113 → 119	Prelay	84	6.1	1425
18	120 → 126		92	6.7	1490

PLEASE NOTE *the attached targets are a guide and not a guarantee. Heavy vaccination schedules and outdoor rearing are likely to affect actual growth. Also, transfer to the laying house normally reduces body weight by 8 to 10% which then takes a few days to recover.*

Performance data laying period – UK Colony

Weeks	% Hen day	Egg size (g)	Egg mass (g/day)	Feed intake g/bird/day	Eggs per HH
18				85	
19	20.2	45.0	9.1	92	1
20	53.0	51.0	27.0	101	5
21	79.1	53.0	41.9	108	11
22	87.2	55.5	48.4	111	17
23	90.9	57.4	52.2	113	23
24	92.9	58.7	54.5	114	30
25	93.7	60.0	56.2	114	36
26	94.5	60.9	57.6	114	43
27	94.6	61.7	58.4	115	49
28	94.8	62.5	59.2	115	56
29	94.8	62.9	59.6	115	62
30	94.8	63.1	59.8	115	69
31	94.8	63.3	59.9	115	75
32	94.8	63.4	60.1	115	82
33	94.9	63.6	60.3	115	89
34	94.9	63.7	60.5	115	95
35	94.9	63.9	60.6	115	102
36	94.8	64.0	60.7	115	108
37	94.7	64.1	60.7	115	115
38	94.6	64.2	60.7	115	121
39	94.6	64.3	60.8	115	128
40	94.5	64.4	60.8	115	134
41	94.3	64.4	60.7	115	141
42	94.3	64.4	60.7	115	147
43	94.1	64.5	60.6	115	154
44	94.1	64.5	60.7	115	160
45	93.9	64.6	60.6	115	167
46	93.9	64.6	60.6	115	173
47	93.7	64.7	60.5	115	179
48	93.5	64.7	60.5	115	186
49	93.3	64.8	60.5	115	192
50	93.2	64.8	60.4	115	199
51	93.2	64.8	60.4	115	205
52	92.9	64.9	60.3	115	211
53	92.8	64.9	60.2	115	218
54	92.6	64.9	60.1	115	224
55	92.4	65.0	60.1	115	230
56	92.3	65.0	60.0	115	236
57	92.1	65.0	59.9	115	243

Weeks	% Hen day	Egg size (g)	Egg mass (g/day)	Feed intake g/bird/day	Eggs per HH
58	91.9	65.0	59.8	115	249
59	91.7	65.1	59.7	115	255
60	91.4	65.1	59.5	115	261
61	91.2	65.1	59.4	115	267
62	91.0	65.1	59.2	115	274
63	90.6	65.1	59.0	115	280
64	90.3	65.2	58.9	115	286
65	90.1	65.2	58.7	115	292
66	89.8	65.2	58.6	115	298
67	89.5	65.2	58.4	115	304
68	89.3	65.2	58.2	115	310
69	88.9	65.3	58.0	115	316
70	88.6	65.3	57.8	115	322
71	88.2	65.3	57.6	115	328
72	87.7	65.3	57.3	115	334
73	87.4	65.3	57.1	115	340
74	86.9	65.4	56.8	115	345
75	86.4	65.4	56.5	115	351
76	85.9	65.4	56.2	115	357
77	85.3	65.4	55.8	115	363
78	84.8	65.4	55.5	115	368
79	84.4	65.5	55.3	115	374
80	83.7	65.5	54.8	115	380
81	83.4	65.5	54.6	115	385
82	82.8	65.5	54.2	115	391
83	82.3	65.5	54.0	115	396
84	81.9	65.6	53.7	115	402
85	81.2	65.6	53.3	115	407
86	80.7	65.6	52.9	115	412
87	80.1	65.6	52.6	115	418
88	79.5	65.6	52.2	115	423
89	78.8	65.7	51.7	115	428
90	78.0	65.7	51.2	115	433
91	77.3	65.7	50.8	115	438
92	76.4	65.7	50.2	115	443
93	75.6	65.7	49.7	115	448
94	74.5	65.8	49.0	115	453
95	73.6	65.8	48.4	115	458

Performance data laying period – UK Colony

Weeks	Egg mass per HH (kg)	Feed intake (cum.) (kg)	Feed conversion (per day)	Feed conversion (cum.)	Mortality (%)	Body weight (g)
18		0.6			0.1	1490
19	0.1	1.2	10.12	19.47	0.2	1550
20	0.3	1.9	3.73	7.70	0.2	1600
21	0.5	2.7	2.58	4.95	0.3	1660
22	0.9	3.5	2.29	3.93	0.4	1710
23	1.2	4.3	2.17	3.42	0.5	1750
24	1.6	5.0	2.09	3.11	0.5	1770
25	2.0	5.8	2.03	2.90	0.6	1790
26	2.4	6.6	1.98	2.75	0.7	1810
27	2.8	7.4	1.96	2.63	0.8	1820
28	3.2	8.2	1.94	2.54	0.8	1830
29	3.6	9.0	1.93	2.47	0.9	1840
30	4.1	9.8	1.92	2.42	1.0	1850
31	4.5	10.6	1.92	2.37	1.1	1860
32	4.9	11.4	1.91	2.33	1.1	1870
33	5.3	12.2	1.91	2.30	1.2	1875
34	5.7	13.0	1.90	2.27	1.3	1880
35	6.1	13.8	1.90	2.24	1.4	1885
36	6.6	14.6	1.90	2.22	1.4	1889
37	7.0	15.4	1.89	2.20	1.5	1893
38	7.4	16.2	1.89	2.19	1.6	1895
39	7.8	17.0	1.89	2.17	1.7	1897
40	8.2	17.8	1.89	2.16	1.7	1900
41	8.7	18.6	1.89	2.14	1.8	1903
42	9.1	19.3	1.89	2.13	1.9	1905
43	9.5	20.1	1.90	2.12	2.0	1907
44	9.9	20.9	1.90	2.11	2.0	1909
45	10.3	21.7	1.90	2.10	2.1	1911
46	10.7	22.5	1.90	2.10	2.2	1912
47	11.2	23.3	1.90	2.09	2.3	1913
48	11.6	24.1	1.90	2.08	2.3	1914
49	12.0	24.9	1.90	2.07	2.4	1915
50	12.4	25.6	1.90	2.07	2.5	1916
51	12.8	26.4	1.90	2.06	2.6	1917
52	13.2	27.2	1.91	2.06	2.6	1919
53	13.6	28.0	1.91	2.05	2.7	1920
54	14.0	28.8	1.91	2.05	2.8	1922
55	14.4	29.6	1.91	2.05	2.9	1923
56	14.8	30.3	1.92	2.04	2.9	1925
57	15.3	31.1	1.92	2.04	3.0	1926

Weeks	Egg mass per HH (kg)	Feed intake (cum.) (kg)	Feed conversion (per day)	Feed conversion (cum.)	Mortality (%)	Body weight (g)
58	15.7	31.9	1.92	2.04	3.1	1928
59	16.1	32.7	1.93	2.03	3.2	1929
60	16.5	33.5	1.93	2.03	3.2	1931
61	16.9	34.2	1.94	2.03	3.3	1932
62	17.3	35.0	1.94	2.03	3.4	1934
63	17.7	35.8	1.95	2.03	3.5	1935
64	18.1	36.6	1.95	2.02	3.5	1937
65	18.5	37.3	1.96	2.02	3.6	1938
66	18.9	38.1	1.96	2.02	3.7	1940
67	19.3	38.9	1.97	2.02	3.8	1941
68	19.6	39.7	1.97	2.02	3.8	1943
69	20.0	40.4	1.98	2.02	3.9	1944
70	20.4	41.2	1.99	2.02	4.0	1946
71	20.8	42.0	2.00	2.02	4.1	1947
72	21.2	42.8	2.01	2.02	4.1	1949
73	21.6	43.5	2.01	2.02	4.2	1950
74	22.0	44.3	2.02	2.02	4.3	1952
75	22.3	45.1	2.03	2.02	4.4	1953
76	22.7	45.8	2.05	2.02	4.4	1955
77	23.1	46.6	2.06	2.02	4.5	1956
78	23.5	47.4	2.07	2.02	4.6	1958
79	23.8	48.1	2.08	2.02	4.7	1959
80	24.2	48.9	2.10	2.02	4.7	1961
81	24.6	49.7	2.10	2.02	4.8	1962
82	24.9	50.4	2.12	2.02	4.9	1964
83	25.3	51.2	2.13	2.03	5.0	1965
84	25.6	52.0	2.14	2.03	5.0	1967
85	26.0	52.7	2.16	2.03	5.1	1968
86	26.3	53.5	2.17	2.03	5.2	1970
87	26.7	54.3	2.19	2.03	5.3	1971
88	27.0	55.0	2.20	2.04	5.3	1973
89	27.4	55.8	2.22	2.04	5.4	1974
90	27.7	56.5	2.24	2.04	5.5	1976
91	28.0	57.3	2.26	2.04	5.6	1977
92	28.4	58.1	2.29	2.05	5.6	1979
93	28.7	58.8	2.31	2.05	5.7	1980
94	29.0	59.6	2.35	2.05	5.8	1982
95	29.3	60.3	2.38	2.06	5.9	1983

Performance data laying period – UK Free Range

Weeks	% Hen day	Egg size (g)	Egg mass (g/day)	Feed intake g/bird/day	Eggs per HH
18				92	
19	8.7	45.0	3.9	104	1
20	28.7	51.0	14.6	111	3
21	47.7	53.0	25.3	117	6
22	65.7	55.5	36.5	120	11
23	80.7	57.4	46.3	122	16
24	88.7	58.8	52.2	123	22
25	91.7	60.0	55.0	124	29
26	93.7	61.0	57.2	124	35
27	94.2	61.9	58.3	125	42
28	94.3	62.4	58.8	125	48
29	94.3	62.8	59.2	125	55
30	94.3	63.1	59.5	125	61
31	94.2	63.3	59.6	125	68
32	94.2	63.4	59.7	125	74
33	94.1	63.6	59.8	125	81
34	94.1	63.7	59.9	125	87
35	94.0	63.9	60.1	125	94
36	93.9	64.0	60.1	125	100
37	93.9	64.1	60.2	125	107
38	93.8	64.2	60.2	125	113
39	93.7	64.3	60.3	125	120
40	93.7	64.4	60.3	125	126
41	93.6	64.4	60.2	125	132
42	93.5	64.4	60.2	125	139
43	93.4	64.5	60.2	125	145
44	93.3	64.5	60.2	125	152
45	93.2	64.6	60.2	125	158
46	93.1	64.6	60.1	125	164
47	93.0	64.7	60.1	125	171
48	92.8	64.7	60.1	125	177
49	92.7	64.8	60.1	125	183
50	92.6	64.8	60.0	125	189
51	92.4	64.8	59.9	125	196
52	92.3	64.9	59.9	125	202
53	92.2	64.9	59.8	125	208
54	92.0	64.9	59.7	125	214
55	91.8	65.0	59.7	125	221
56	91.7	65.0	59.6	125	227
57	91.5	65.0	59.5	125	233

Weeks	% Hen day	Egg size (g)	Egg mass (g/day)	Feed intake g/bird/day	Eggs per HH
58	91.3	65.0	59.4	125	239
59	91.1	65.1	59.3	125	245
60	90.9	65.1	59.2	126	251
61	90.7	65.1	59.1	126	258
62	90.5	65.1	58.9	126	264
63	90.2	65.1	58.8	126	270
64	90.0	65.2	58.6	126	276
65	89.7	65.2	58.5	126	282
66	89.5	65.2	58.3	126	288
67	89.2	65.2	58.2	126	294
68	88.9	65.2	58.0	126	300
69	88.6	65.3	57.8	126	306
70	88.3	65.3	57.7	126	311
71	88.0	65.3	57.5	126	317
72	87.7	65.3	57.3	126	323
73	87.3	65.3	57.0	126	329
74	86.9	65.4	56.8	126	335
75	86.5	65.4	56.6	126	340
76	86.1	65.4	56.3	126	346
77	85.7	65.4	56.1	126	352
78	85.2	65.4	55.8	126	357
79	84.8	65.5	55.5	126	363
80	84.3	65.5	55.2	126	369
81	83.8	65.5	54.9	126	374
82	83.2	65.5	54.5	126	380
83	82.6	65.5	54.2	126	385
84	82.0	65.6	53.8	126	390
85	81.4	65.6	53.4	126	396
86	80.7	65.6	53.0	126	401
87	80.0	65.6	52.5	126	406
88	79.3	65.6	52.0	126	412
89	78.5	65.7	51.5	126	417
90	77.6	65.7	51.0	126	422
91	76.7	65.7	50.4	126	427
92	75.8	65.7	49.8	126	432
93	74.8	65.7	49.2	126	437
94	73.7	65.8	48.5	126	441
95	72.5	65.8	47.7	126	446

Performance data laying period – UK Free Range

Weeks	Egg mass per HH (kg)	Feed intake (cum.) (kg)	Feed conversion (per day)	Feed conversion (cum.)	Mortality (%)	Body weight (g)
18		0.6			0.1	1490
19		1.4	26.56	50.09	0.2	1550
20	0.1	2.1	7.58	16.56	0.3	1600
21	0.3	3.0	4.63	9.68	0.4	1660
22	0.6	3.8	3.29	6.78	0.5	1720
23	0.9	4.6	2.63	5.27	0.5	1750
24	1.2	5.5	2.36	4.42	0.6	1770
25	1.6	6.4	2.25	3.91	0.7	1790
26	2.0	7.2	2.17	3.57	0.8	1810
27	2.4	8.1	2.14	3.33	0.9	1820
28	2.8	9.0	2.12	3.16	1.0	1830
29	3.2	9.8	2.11	3.03	1.1	1840
30	3.7	10.7	2.10	2.92	1.2	1850
31	4.1	11.6	2.10	2.84	1.3	1860
32	4.5	12.4	2.09	2.77	1.4	1870
33	4.9	13.3	2.09	2.71	1.4	1875
34	5.3	14.1	2.09	2.66	1.5	1880
35	5.7	15.0	2.08	2.62	1.6	1885
36	6.1	15.9	2.08	2.58	1.7	1889
37	6.5	16.7	2.08	2.55	1.8	1893
38	7.0	17.6	2.08	2.52	1.9	1895
39	7.4	18.4	2.07	2.50	2.0	1897
40	7.8	19.3	2.07	2.48	2.1	1900
41	8.2	20.1	2.07	2.46	2.2	1903
42	8.6	21.0	2.08	2.44	2.3	1905
43	9.0	21.9	2.08	2.42	2.3	1907
44	9.4	22.7	2.08	2.41	2.4	1909
45	9.8	23.6	2.08	2.39	2.5	1911
46	10.3	24.4	2.08	2.38	2.6	1912
47	10.7	25.3	2.08	2.37	2.7	1913
48	11.1	26.1	2.08	2.36	2.8	1914
49	11.5	27.0	2.08	2.35	2.9	1915
50	11.9	27.8	2.08	2.34	3.0	1916
51	12.3	28.7	2.09	2.33	3.1	1917
52	12.7	29.5	2.09	2.32	3.2	1919
53	13.1	30.4	2.09	2.32	3.2	1920
54	13.5	31.2	2.10	2.31	3.3	1922
55	13.9	32.1	2.10	2.30	3.4	1923
56	14.3	32.9	2.10	2.30	3.5	1925
57	14.7	33.7	2.11	2.29	3.6	1926

Weeks	Egg mass per HH (kg)	Feed intake (cum.) (kg)	Feed conversion (per day)	Feed conversion (cum.)	Mortality (%)	Body weight (g)
58	15.1	34.6	2.11	2.29	3.7	1928
59	15.5	35.4	2.12	2.28	3.8	1929
60	15.9	36.3	2.12	2.28	3.9	1931
61	16.3	37.1	2.13	2.28	4.0	1932
62	16.7	38.0	2.13	2.27	4.1	1934
63	17.1	38.8	2.13	2.27	4.1	1935
64	17.5	39.7	2.14	2.27	4.2	1937
65	17.9	40.5	2.15	2.26	4.3	1938
66	18.3	41.3	2.15	2.26	4.4	1940
67	18.7	42.2	2.16	2.26	4.5	1941
68	19.1	43.0	2.16	2.26	4.6	1943
69	19.4	43.8	2.17	2.26	4.7	1944
70	19.8	44.7	2.18	2.25	4.8	1946
71	20.2	45.5	2.18	2.25	4.9	1947
72	20.6	46.4	2.19	2.25	5.0	1949
73	21.0	47.2	2.20	2.25	5.0	1950
74	21.3	48.0	2.21	2.25	5.1	1952
75	21.7	48.9	2.22	2.25	5.2	1953
76	22.1	49.7	2.23	2.25	5.3	1955
77	22.5	50.5	2.24	2.25	5.4	1956
78	22.8	51.3	2.25	2.25	5.5	1958
79	23.2	52.2	2.26	2.25	5.6	1959
80	23.6	53.0	2.27	2.25	5.7	1961
81	23.9	53.8	2.29	2.25	5.8	1962
82	24.3	54.7	2.30	2.25	5.9	1964
83	24.6	55.5	2.32	2.25	5.9	1965
84	25.0	56.3	2.33	2.25	6.0	1967
85	25.3	57.1	2.35	2.25	6.1	1968
86	25.7	58.0	2.37	2.26	6.2	1970
87	26.0	58.8	2.39	2.26	6.3	1971
88	26.4	59.6	2.41	2.26	6.4	1973
89	26.7	60.4	2.44	2.26	6.5	1974
90	27.1	61.2	2.46	2.26	6.6	1976
91	27.4	62.1	2.49	2.27	6.7	1977
92	27.7	62.9	2.52	2.27	6.8	1979
93	28.0	63.7	2.55	2.27	6.9	1980
94	28.3	64.5	2.59	2.28	7.0	1982
95	28.7	65.3	2.63	2.28	7.1	1983

Classification of Eggs

% of eggs per weight class at given weight

Average egg weight (g)	Percentage of eggs in weight class			
	XL >73	L 63-73	M 53-63	S <53
45	0	0	1	99
46	0	0	2	98
47	0	0	4	96
48	0	0	8	92
49	0	0	13	87
50	0	0	20	80
51	0	0	29	71
52	0	0	40	60
53	0	0	50	50
54	0	1	59	40
55	0	2	67	31
56	0	4	73	23
57	0	7	76	17
58	0	12	76	12
59	0	18	74	8
60	0	25	70	5
61	0	32	64	4
62	1	41	56	2
63	1	49	49	1
64	3	55	41	1
65	5	61	33	1
66	7	67	26	0
67	11	69	20	0
68	16	69	15	0
69	21	67	12	0
70	28	64	8	0

% of eggs per class at a given age at breed standard egg weight

Weight class	Weight (g)	Age (weeks)					
		30	40	50	60	70	80
XL	>73	2.3%	1.4%	1.1%	1.0%	0.9%	0.9%
L	63-73	46.9%	38.2%	35.1%	33.5%	32.2%	30.9%
M	53-63	48.3%	55.7%	58.0%	59.1%	59.9%	60.6%
S	<53	2.5%	4.7%	5.7%	6.4%	7.0%	7.6%

% cumulative eggs per class to 80 weeks when managed for a certain average egg weight (HH basis)

Weight class	Weight (g)	Average egg weight (g) to 80 weeks						
		68g	67g	66g	65g	64g	63g	62g
XL	>73	21.4%	17.2%	13.3%	9.8%	6.8%	4.4%	2.7%
L	63-73	58.3%	58.0%	56.9%	54.9%	51.9%	47.8%	42.5%
M	53-63	18.5%	22.5%	26.8%	31.4%	36.3%	41.5%	47.0%
S	<53	1.8%	2.3%	3.0%	3.9%	5.0%	6.3%	7.8%

NUTRITION

UK Colony recommendations

Do not change until body weight has been achieved.

Diet	Starter	Grower	Developer	Prelay[1]
Age (weeks)	**0 to 5**	**6 to 10**	**11 to 16**	**17 to 1st egg**
Production (%HD)				**1st egg**
Body weight at change to next diet (g)	**340**	**810**	**1350**	
Crude Protein (%)	20.0	18.5	15.9	16.3
ME (kcal/kg)	2950	2850	2725	2725
ME (MJ/kg)	12.3	11.9	11.4	11.4
Linoleic Acid[3] (%)	1.5	1.25	1.25	1.25
Methionine (%)	0.59	0.47	0.38	0.41
Meth + Cys (%)	1	0.85	0.66	0.71
Lysine (%)	1.16	0.98	0.76	0.82
Arginine (%)	1.19	1.01	0.79	0.85
Tryptophan (%)	0.26	0.22	0.18	0.19
Threonine (%)	0.85	0.72	0.56	0.6
Ca (%)	0.9	0.8	0.7	2.2
Available Phosphorus (%)	0.50	0.44	0.39	0.38
Sodium (%)	0.18	0.16	0.16	0.16

Notes

1 When birds start to lay early change to layer ration more quickly or do not use prelay.

2 Lower ambient temperatures increase feed consumption through greater energy requirement.

3 Linoleic acid has to be adjusted according to the target egg size. Up to 2.5% could be used to increase the egg size.

Diet	Layer 1	Layer 2	Layer 3	Layer 4
Age (weeks)	**1st egg to 40**	**40 to 65**	**65 to 90**	**90+**
Crude Protein (%)	16.8	16.5	16.2	15.9
Crude Fibre (%)	3.5	4	4	4
ME (kcal/kg)*	2725	2725	2725	2725
ME (MJ/kg)	11.6	11.6	11.6	11.6
Linoleic Acid[3] (%)	1.2	1.2	1.2	1.2
Methionine (%)	0.43	0.42	0.41	0.39
Met + Cys (%)	0.75	0.73	0.71	0.67
Lysine (%)	0.83	0.81	0.78	0.75
Tryptophan (%)	0.2	0.2	0.19	0.18
Threonine (%)	0.6	0.59	0.56	0.55
Ca (%)	3.40	3.60	3.80	4.00
Available Phosphorus (%)	0.36	0.34	0.32	0.30
Sodium (%)	0.16	0.16	0.16	0.16

*Can reduce 25 Kcal per each phase

4 For UK Colony flocks with good body weight, good feed intake and a smaller egg size requirement change to Layer 2 diet before peak. Ca levels can be adjusted down until the birds reach 40+ weeks.

5 Age of ration change is approximate and should be done in line with body weight, egg size requirements, egg mass output, environmental conditions and other management criteria.

6 Amino acids listed are in the form of total amino acid.

UK Free Range recommendations

Do not change until body weight has been achieved.

Diet	Starter	Grower	Developer	Prelay[1]
Age (weeks)	**0 to 5**	**6 to 10**	**11 to 16**	**17 to 1st egg**
Production (%HD)				**1st egg**
Body weight at change to next diet (g)	**340**	**810**	**1350**	
Crude Protein (%)	20.0	18.5	15.9	16.3
ME (kcal/kg)	2975	2875	2750	2750
ME (MJ/kg)	12.4	12	11.5	11.5
Linoleic Acid[3] (%)	1.5	1.25	1.25	1.25
Methionine (%)	0.59	0.47	0.38	0.41
Met + Cys (%)	1	0.85	0.66	0.71
Lysine (%)	1.16	0.98	0.76	0.82
Arginine (%)	1.19	1.01	0.79	0.85
Tryptophan (%)	0.26	0.22	0.18	0.19
Threonine (%)	0.85	0.72	0.56	0.6
Ca (%)	0.9	0.8	0.7	2.2
Available Phosphorus (%)	0.50	0.44	0.39	0.38
Sodium (%)	0.18	0.16	0.16	0.16

Notes

1 When birds start to lay early change to layer ration more quickly or do not use prelay.

2 Lower ambient temperatures increase feed consumption through greater energy requirement.

3 Linoleic acid has to be adjusted according to the target egg size. Level close to 2.5% could be used to increase the egg size.

Diet	Layer 1	Layer 2	Layer 3	Layer 4
Age (weeks)	**1st egg to 40**	**40 to 65**	**65 to 90**	**90+**
Crude Protein (%)	16.8	16.5	16.2	15.9
Crude Fibre (%)	3.5	4	4	4
ME (kcal/kg)*	2800	2800	2800	2800
ME (MJ/kg)	11.7	11.7	11.7	11.7
Linoleic Acid[3] (%)	1.2	1.2	1.2	1.2
Methionine (%)	0.42	0.41	0.4	0.39
Met + Cys (%)	0.73	0.71	0.69	0.67
Lysine (%)	0.81	0.79	0.77	0.75
Tryptophan (%)	0.2	0.2	0.19	0.18
Threonine (%)	0.59	0.58	0.56	0.55
Ca (%)	3.20	3.40	3.60	3.80
Available Phosphorus (%)	0.34	0.34	0.32	0.30
Sodium (%)	0.16	0.16	0.16	0.16

*Can reduce 25 Kcal per each phase

4 Age of ration change is approximate and should be done in line with body weight, egg size requirements, egg mass output, environmental conditions and other management criteria.

5 Amino acids listed are in the form of total amino acid.

6 It is important to look at floor system flock energy requirements particularly in extreme weather and in cases of poor feathering.

7 **Continue feeding Layer 1 until daily egg mass produced starts to go down.**

Suggested premix composition for commercial layers

For Commercial Layers		Rearing period		Laying period
		0-10 weeks	10 wks - 2% Lay	
Added trace elements mg per kg of diet				
Manganese (Mn)	mg	60	60	80
Zinc (Zn)	mg	60	60	60
Iron (Fe)	mg	40	40	40
Iodine (I)	mg	1	1	1
Copper (Cu)	mg	8	6	8
Selenium (Se)	mg	0.25	0.25	0.25
Added vitamins per kg of diet in IU or mg				
Vitamin A	IU	10000	10000	10000
Vitamin D3	IU	3000	2000	2500
Vitamin E	mg	25	25	20
Vitamin K3	mg	3	3	3
Vitamin B1 (Thiamine)	mg	2	2	2
Vitamin B2 (Riboflavin)	mg	5	5	5
Vitamin B6 (Pyridoxine)	mg	5	3	4
Vitamin B12	mg	0.03	0.02	0.03
Nicotinic Acid (Niacin)	mg	60	40	40
Pantothenic Acid	mg	15	10	10
Folic Acid	mg	1	1	1
Biotin	mg	0.2	0.15	0.15
Total Choline requirement per kg of diet (raw materials included) mg				
Choline[1]	mg	600	500	500

[1]Can be partly replaced by Betaine

Mixing

Trace elements and vitamins should be correctly mixed before being added to the raw materials. Premixes have to be mixed at a minimum level of 3kg per tonne. Improper mixing or handling can be checked by dosing Manganese as a tracer.

For our complete nutrition guide for both our Brown and White breeds, please scan the QR code below.

MANAGEMENT

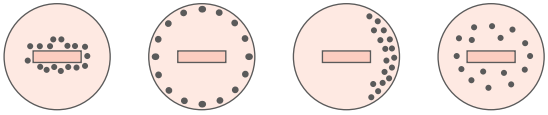
Rearing period

Brooding temperature

Age	Chick level temperature
first 5 hours	32°C
5 hrs – 7 days	32°C to 30°C
2nd week	30°C to 28°C
3rd week	28°C to 26°C
4th week	26°C to 24°C
5th week	24°C to 22°C
6th week	22°C to 20°C

Key points

- Do not reduce air temperature by more than 0.5°C per day.
- The rearing environment should be clean and well disinfected. All material from the previous flock should have been removed. We recommend dusting down the unit before taking out of the litter. The wet cleaning of the house and equipment is advisable and this should be allowed to dry before disinfection. Vermin and problem insects such as mites should be controlled.
- Restrict access of personnel and equipment to the rearing house, especially if they have been in recent contact with adult or older birds. This is especially important in the first few weeks of rear. Good bio-security and hygiene should be maintained at all times.
- Raise house temperature at least 24 hours before chick arrival to 29-31°C to ensure that the equipment and floor are warm.
- Watch the behaviour of the chicks and adapt temperature accordingly to that behaviour.



- Supplementary drinkers are recommended for the first few days. The water should be in the drinkers before the chicks arrive to allow it to reach ambient temperature.
- Ensure all water cleaning products are thoroughly flushed before placement.
- Nipple line height adjusted regularly in line with chick growth

Beak treatment

This is carried out at the hatchery, at one day old, using IR technology.

Relative humidity

A relative humidity of 60-70% is advised.

Optimum light intensity

Age	Lux	Watts/m^2
0 – 7 days	Min. 20	Min. 4
7 days – 4 weeks	10	3.2
4 –17 weeks	6	2
17 – 26 weeks	10	3.2
beyond 26 weeks	6	2

Lighting programmes and other management techniques

The lighting programme should be suitable for the production goals, system of production, condition of the flock and time of housing (see suggested light programmes on page 39). In general the step down should be slow enough to allow good early body weight development.

The timing and amount of the first step up in day length is critical and should be judged on a flock by flock basis, taking account of the flock's health, body weight development, uniformity, age of movement to laying house, season, system of production and production goals. The closer to 12 weeks and the bigger the day length increase, the greater the effect on maturity. Egg size is influenced by the weight at first egg but can also be effectively controlled by nutrition.

Flocks pushed into lay too early risk later production problems. We would recommend producers not to give a light increase before the following criteria are met:

- 1260g body weight (UK Colony systems)
- 1350g body weight (UK Alternative/Free Range systems)
- 80% uniformity

Do not change the lights-off time once the flock is in lay. In practice this means that we advise to fix the lights-off time as soon as possible after housing and to increase the day length by adding light in the morning.

Seasonal variation

In a controlled environment house (lightproof) the seasonal fluctuations of day length still interfere with the flock performance.

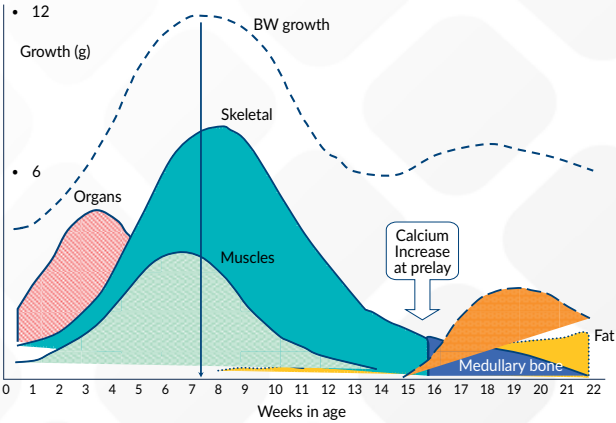
Therefore, for a windowless house, it is also necessary to adapt the standard lighting programme to the hatch season. Flocks hatched in the 'off season', with reduced day length should be light stimulated earlier than those reared in the increasing day length season.

In houses where light control is not possible, the minimum day length should not be less than the natural day length between 8 and 18 weeks of age.

Body weight development

- Good early growth is critical and by 5 weeks body weight should be as high as possible since frame and internal organ development take place in this period. The birds should be monitored for weekly growth from delivery and any negative variation to standard should be looked into. In particular the first few days of life are crucial to obtaining good development and later uniformity. Brooding temperatures, provision of ample water, fresh feed and good bio-security are all important. If necessary the stepping down of the day length should be slowed.
- 5 to 14 weeks – When the body weight is on or above the standard then try to obtain the same growth per week as the given standard. When body weight on 5 weeks of age is lower than our standard it is important to achieve standard body weight as quickly as possible.
- From 14 weeks onwards try to achieve a body weight as high as possible.

Figure 1: Body weight development



Uniformity

- Uniformity of body weight (+/–10%) should be at least 75% at 10 weeks of age and at least 80% from 15 weeks onwards.

Feeding

- The best possible diets should be fed in the first few weeks of life – financial input here will be rewarded with better production later in life.
- Crumbs/pelleted feed can be useful in maximising early body weight. After 6 weeks, mash is the favourable feed presentation.
- Clean water should be available at all times and care should be taken that there is provision for demand at peak times. Thorough cleaning after depletion and continuous dosing/ periodic cleansing with a suitable product to maintain water standard are good practice to reduce bacterial challenge on the birds. After clean out any chemicals used to clean the water system must be thoroughly flushed through. Care should also be taken when vaccinating and no chemicals or residue should be present at this time.
- The habit of cleaning up feed in the tracks or pans should be started in the latter half of the rear, (by week 7). Ideally by week 7 in rear the birds are trained to 'mealtimes' with an eat-out period in the middle of the birds day. One third of the days feed intake to be distributed in the eat-out period and the balance during 'mealtimes'.

Vaccination

This too is crucial to a successful flock. Consult with your veterinary surgeon as to what vaccinations will be necessary to protect your flock in rear and lay. Apply the vaccine with care to ensure that all birds receive a dose of active vaccine. Managers and staff should be given professional training. The use of proportioners and water buffers is advised.

Monitor the blood titre levels of important vaccines such as IB. If the priming levels are poor, birds should be re-vaccinated at least 14 days prior to receiving inactivated (injected) vaccines. It is a good idea to store sera taken 3 weeks after housing so base line titres can be obtained in case of a suspected challenge of field virus.

Transfer to the laying house

This is a stressful period for the birds due to handling and transport involved in movement from rearing to laying facilities, and the change from rearing to laying environment. This should be done 4 weeks, (ideally) and certainly no later than 2 weeks before egg production starts. This will give the bird enough time to adapt to the situation in the new environment.

Preparation – rearing farm

Birds must always conform to the breed body weight.

Light intensity and rearing temperature should be adjusted, over a period of 2 to 4 weeks, and must be equal to the level in the laying house. 2 weeks prior to transfer the birds should not be handled, except for routine uniformity and body weight checks. Birds must have every opportunity to grow, even during this critical period.

Insoluble grit (where appropriate) should have been provided for the flock, ideally during the entire rearing period, but at least 2 weeks prior to transfer.

Feed withdrawal before departure should not exceed 6 hours and should be adapted to transport duration and climatic conditions.

Preparation – laying farm

An appropriate terminal hygiene programme must be implemented to avoid disease transmission.

Maintenance and repairs to complete before arrival of stock:

- Flush the water system and provide fresh water the day before arrival of new stock.
- Where nipple lines are used, ensure the height is slightly above the back of the birds (for the first 7 days), then raised to ensure birds "comfortably stretch" to use the nipples. Bell drinkers should be filled to double the normal depth, and lowered to a height of 20 cm above floor level, for the first 2 or 3 days.

The house should be dried prior to the arrival of the new flock and preheated in cold season.

Transfer

An ideal time for transfer is during the early morning. If the birds are unloaded by the time their day started on the rearing farm, disturbance to their routine of drinking and eating is minimised.

Transport vehicles and equipment must be clean and disinfected.

The flock should be transferred within the same day according to local legislation.

The whole procedure should be fast with the loading of the birds, transport and unloading all conforming to local regulations. Additionally every effort should be made before and after transfer to maintain water and feed intake according to the normal routine of the stock.

Precautions should be taken to minimise undue exposure to wind and rain/sun during transfer procedure.

After housing

The period of the first 48 hours after housing is a critical period; close supervision and observation are required to ensure the normal behaviour of the entire flock.

The following points should be noted:

- Water consumption – normal drinking habits, within 6 hours after arrival.
- Temperature – ideally 15°C, 18°C is the maximum temperature. It is important that birds do not become chilled but they must have fresh air.
- Feed consumption – increasing appetite/intake.
- General attitude of the flock – At first it will be quiet, but should gradually become more active and 'talkative', but not frenetic or hyperactive.
- If slats are incorporated in the house, the birds have to be encouraged to perch during the dark night period. This may take 3 to 7 days to occur prior and during lights off.
- Keep nest boxes closed until 7 days prior to the expected onset of lay or until you see the first egg.
- Open them almost 2 hours before the main house lights and keep open until late afternoon.
- Light intensity must be high – please consult your breed representative on housing but should be gradually reduced to the recommended levels shown on page 25.
- Dim the light gradually at light off – Please consult your breed representive for advice.
- It is recommended that birds are kept on the system for a few days if they are not reared on a partly slatted house (according to local regulations).

Laying period

Start of lay key results

In general, good performance will be obtained when the following key results are achieved:

Body weight (g)	Approx age (weeks)		Day length (hrs)	Feed intake (g/bird/ day) (UK Colony)	Feed intake (g/bird/ day) (UK Free Range)
1450	17	start light stimulation pre-lay diet	11	80	84
1475	18	start layer diet	12	87	92
1555	19	first egg	13	101	104
1605	20	±35% production	14	108	111
1660	21	65% production	14-16	111	117
1715	22	85% production	14-16	112	120
1780	26	peak production	14-16	113	124

- We advise to increase the day length until maximum 16 hours per day for floor system and 14-16 hours for intensive.

Body weight development

- After 16 weeks body weight development is critical for a good start to production; avoid unnecessary stress during this time; house the birds before 17 weeks.
- Give a prelay diet but ensure the birds are on the layer feed before production starts.
- Changes in diet are dependent on the production level, body weight and feed intake and not on age.

Feeding

- Deviation from body weights and feed amounts given on page 7 may occur due to season, housing system, feed composition, transport and health status of the flock.
- The feeding programme should be synchronised with the lighting programme to bring the flock into production in a good condition and at the desired age. Feed intake should be measured.
- From 16 to 21 weeks it is critical that the feed intake increases, in order to let the birds grow to achieve target body weight.
- It is good practice to empty the feeders during the middle part of the day. This encourages good feeding behaviour, allowing a good crop of feed to be consumed before the dark period and ensures the whole ration is consumed. Care should be taken to avoid restriction – the birds should be working for the last bit of feed in the pan, track or trough rather but not to the point it is bare. Uniform feed distribution is important in this respect and it may be necessary to feed twice in quick succession after the feeding gap.
- Ideally changes in diet, including raw materials used, should not be made between peak and 40 weeks. Ensure the flock is on a suitable diet to take them through to post 40 weeks by the time peak is reached.
- After 6 weeks, mash is the favoured feed presentation rather than crumbs or pellets. It also allows more granular forms of calcium which help provide this nutrient at the right time for shell formation.
- Birds have a strong preference for coarse particles – they tend to leave the fine part of the feed. Consequently, the feed needs to be uniform with a maximum of 10% coarse particles above 3.2mm and 15% maximum of fines particles below 0.5mm. Too high proportion of coarse particles will lead to feed sorting, uneven body weight and laying performance, too high proportion of fine particles will decrease feed consumption.
- Birds also do not like variation in feed presentation. Similarly to fine particles, variation in feed presentation decreases feed consumption.

- Addition of 1% oil to mash layer feed, is recommended to improve feed presentation. Oil sticks the finest particles and makes them easily 'eatable'.
- In the case when the feed intake is very low or the feed presentation is poor, crumbs can be used, they are easy to take by beak and each particle is nutritionally balanced. Crumbs increase water intake and wet droppings and a change from crumbs to mash, can decrease feed consumption.
- Feed distribution during the time that egg laying is intensive increases dirty eggs and floor eggs.

Fibre for layers

Birds have a specific requirement for fibre. Deficiency in fibre can lead to feather pecking. Poor feathering observed in a flock without feathers visible on the floor could be a sign of a lack of fibre. A good supply of fibre improves feathering, decreases mortality, improves gut health and digestion.

Fibre provided to layer flocks must be insoluble and as much as possible of a coarse presentation.

Fibre could be provided through the feed by oilseed meal (sunflower/rapeseed), alfalfa (or lucerne), and oats. Cereal by-products could provide a good amount of fibre in the feed, but their presentation is usually too fine to have 'structure effect' on the digestive tract.

In alternative systems fibre could be provided directly in the building. We advise the use of a coarse fibre such as straw, alfalfa (or lucerne), wood shavings, rice/oat husk, silage, etc. These materials must be available in the building through round feeders or directly as a ball on the scratching area.

Birds must have a free and ad libitum access to fibre sources. We advise to not spread fibre directly on the floor. To prevent floor eggs, fibre supply must be introduced after peak production when the birds are well trained to use the nest.

Water

The water is the most critical nutrient for the poultry.
The daily control of water consumption is essential. If an animal does not drink, it will not eat and cannot produce.

Water quality

Good quality drinking water is very important for (production) animals. Birds must always have easy access to the drinking water, the water must be fresh and bright. Taste and smell seem to be of less importance to the birds but are indicators for the water quality. See guidance table below:

Parameter	Poultry	
	Good quality	Do not use
PH	5 – 8.5	<4 and >9
Ammonium mg/l	<2.0	>10
Nitrate mg/l	<0.1	>1.0
Nitrate mg/l	<100	>200
Chloride mg/l	<250	>2000
Sodium mg/l	<800	>1500
Sulphate mg/l	<150	>250
Iron mg/l	<0.5	>2.5
Manganese mg/l	<1.0	>2.0
Lime/chalk content	<20	>25
Oxidizable organic matter mg/l	0.5	0.2
H_2S	Non detectable	Non detectable
Coliform bacteria cfu/ml	<100	>100
Total bacteria content cfu/ml	<100.000	>100.000

Monitoring water quality

The value of any analysis depends on when, where, and how the sample has been taken (where it enters the house or at the end of the system). One should not forget that an analysis only refers to the quality of the water at the time when the sample was taken, and is never a guarantee of its quality at another time.

Where farms have their own water supply, it is necessary to take a sample at least twice a year (once at the end of winter, the other at the end of summer). On farms using the mains supply an annual measurement should be adequate.

In addition, if birds are or have been treated with medication or vitamins through the water system take care to avoid build up of bio-film.

It is important to realise that the sodium thiosulphate, contained in the flasks supplied by the laboratories carrying out bacteriological tests on water, only neutralises chlorine or bleach. It has no action on quaternary ammonium compounds.

Water consumption

Water consumption depends on ambient temperature. Above 20°C, consumption increases to enable the bird to maintain body temperature (respiratory evaporation).

The actual consumption depends on temperature and humidity of the ambient air. The following table shows the relationship between water and feed consumption according to house temperature:

Water to feed ratio according to temperature in rearing and laying period

Temperature	Water: Feed ration Production		Estimated water consumption during production period (ml)
	In rear	In lay	
15˚C	1.6:1	1.7:1	210
20˚C	1.7:1	1.8:1	205
25˚C	2.3:1	2.1:1	230
30˚C	3.0:1	3.1:1	320

Temperature

Although the laying hen can tolerate a wide range of temperature variation and still perform well, excessive fluctuations in environmental temperatures are detrimental to productivity and efficiency. At the beginning of the production period the ideal house temperature is between 21-24°C, slowly increasing as the bird ages. Temperatures below 12°C and above 28°C will negatively affect performance. Lower house temperatures will increase feed consumption and lead to larger egg size. Higher house temperatures can slow egg size increase and limit feed consumption early in lay. Higher house temperature can be utilised later in lay to control feed consumption and prevent excessive egg size.

Air quality

It is necessary to maintain good air quality – minimum ventilation rates should be maintained at all times. All areas of the house should have some level of air movement. A minimum ventilation rate of 1.5m3/hour/kg of body weight should be maintained.

Light intensity

A uniform distribution of light is recommended.

Floor system flocks may be reduced to 6 lux once peak lay has been reached.

Collecting floor eggs

It is important to start collecting floor eggs as soon as the lights in the house are switched on. This reduces the number of floor eggs and trains the birds to lay in the nest boxes.

To reduce the number of floor eggs it is also crucial to have a good nest box:

- The nest box should be free of draught.
- Entrance to the nest should be clearly visible to the birds.
- Nest boxes should be easily accessible and preferably be located in the centre of the house.
- To prevent floor eggs the water lines are ideally positioned near to the nest boxes so that all the birds will have to visit that area and be encouraged to explore the nest boxes.

- Open the nest boxes with nest box lights switched on 7-10 days before start of production. Do not disturb the birds during the main laying period.
- When floor eggs are found just after lights go on, open the nest boxes earlier, or place small light bulbs in the centre of the house and light these light bulbs ½ hour to 1 hour before normal lights go on.
- Collect floor eggs several times per day.
- Do not disturb the birds during laying. Minimise feeding times from between 3 and 6 hours after lights go on.
- Diminish the number of dark spots in the house, because dark spots can increase the number of floor eggs.
- Place obstacles in places where birds continue to lay floor eggs.

General management

Good bio-security practices should be maintained at all times. Visitors should be restricted and those that are necessary should be provided with clean boots and overalls. Hand washing should be enforced before and after contact with the livestock. Feed spills should be cleaned up promptly and the site should generally remain tidy and free from vermin refuges. Houses should be wild bird proof and pets kept from contact with the poultry.

Floor system birds should be regularly wormed. Red mites, flies and other vermin should be monitored and populations kept under control.

Management of the ranging area for free range and organic flocks is a wide and complex subject but it is crucial to success. In particular the area of close proximity to the house should be well drained and its use rotated. Between crops it should be ideally turned and re-seeded. Fencing should be maintained in order to prevent losses to predators.

For further information on nutritional guidance, please ask your breed representative for our comprehensive Nutrition Guide.

Shaver Lighting Programme

System: UK Free Range

Age (weeks)	Age (days)	Day length at start of week (hours)	Light intensity	Temp (°C)
0	0	23	20	32
1	7	20	10	30
2	14	18		28
3	21	16		26
4	28	14	6	24
5	35	12		22
6	42	10		21
7	49	10		21
8	56	10		21
9	63	10		21
10	70	10		21
11	77	10		21
12	84	10		21
13	91	10		21
14	98	10		21
15	105	10		21
16	112	10	10	21
17	119	11		21
18	126	12		21
19	133	13		21
20	140	14		21
21	147	15		21
22	154	16		21
23	161	16		21
24	168	16		21
25	175	16	6	21

NB: This is a sample programme only and lighting programme should be matched to time of year, body weight and egg size requirements.

Lighting programmes are only effective in light controlled environments.

Please consult your local breed representative for further advice on lighting and timing of stimulation.

Only increase day length (stimulate on body weight) based on the following **Egg Size (ES)** requirements:

Small ES: 1300g – 1350g
Standard ES: 1400g – 1450g
Large ES: 1500g – 1550g

Increase and continue when body weight has been achieved.

System: UK Colony

Age (weeks)	Age (days)	Day length at start of week (hours)	Stocking density (sq cm per bird)	Temp (°C)
0	0	23	125	32
1	7	19		30
2	14	15		28
3	21	13	220	26
4	28	11		24
5	35	9		22
6	42	9		21
7	49	9		21
8	56	9		21
9	63	9		21
10	70	9	350	21
11	77	9		21
12	84	9		21
13	91	9		21
14	98	9		21
15	105	10		21
16	112	11	750	21
17	119	12		21
18	126	13		21
19	133	14		21
20	140	14		21
21	147	14		21
22	154	14		21
23	161	14		21
24	168	14		21
25	175	14		21

NB: Light and feed schedule should be linked to body weight, uniformity and egg size requirements.

Uneven or poor body weight flocks should be stimulated a little later and possibly fed a higher density diet for the first 4 weeks after housing.

Lighting programmes are only effective in light controlled environments.

General principles of lighting programmes during the production period

In production as well as in rearing, the lighting programme greatly influences feed consumption. In addition, during all its life, a chicken remains sensitive to changes in the duration of illumination.

The objective of the lighting programmes during the production period is:

- To encourage growth at start of lay
- To counteract the harmful effects of decreases in natural day length
- To control the liveability through the light intensity management
- To improve eggshell quality

Other lighting programmes can also be introduced during the production period to adapt the egg weight to market demand, to improve eggshell quality or to control feed intake for some breeds.

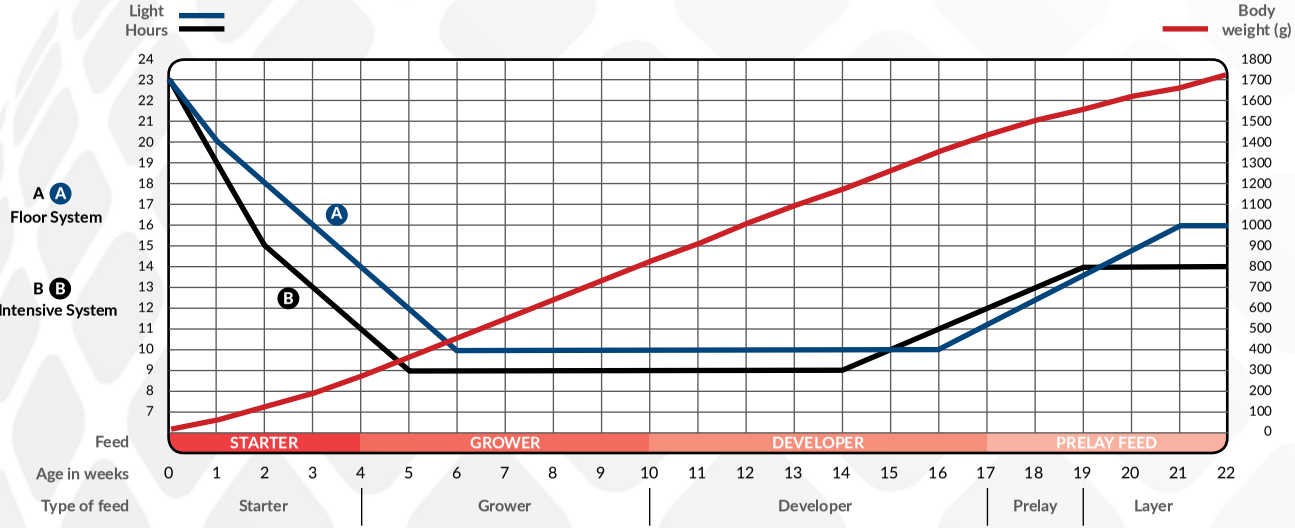
Do not change the lights-off time once the flock is in lay. In practice this means that we advise to fix the lights-off time as soon as possible after housing and to increase the day length by adding light in the morning.

Light intensity in production

The light intensity required is low. No significant differences have been found in the different trials with today's breeds. But as stated for the rearing period, we encourage an increase in light intensity for a few days from the transfer time in order to help the bird to discover its new environment and to find easily water and feed systems.

Thereafter, the light intensity can be reduced step by step to a minimum of 0.5 lux at the feeder level in the dimmest areas of the laying house as long as during the rearing stage light intensity doesn't exceed 10 lux.

Rearing Chart



CONVERSION TABLE

1 mtr	= 3.282 feet	1 foot	= 0.305 mtr
1 sq mtr	= 10.76 sq feet	1 sq foot	= 0.093 sq mtr
1 cub mtr	= 35.316 cub feet	1 cub foot	= 0.028317 cub mtr
1 cm	= 0.394 inches	1 inch	= 2.54 cm
1 sq cm	= 0.155 sq inch	1 sq inch	= 6.45 sq cm
1 kg	= 2.205 lbs	1 lb	= 0.454 kg
1 g	= 0.035 ozs	1 oz	= 28.35 g
1 ltr	= 0.22 gallons	1 gallon	= 4.54 ltr

1 bird per square metre	= 10.76 square feet per bird
3 birds per square metre	= 3.59 square feet per bird
4 birds per square metre	= 2.69 square feet per bird
5 birds per square metre	= 2.15 square feet per bird
7 birds per square metre	= 1.54 square feet per bird
11 birds per square metre	= 0.98 square feet per bird
13 birds per square metre	= 0.83 square feet per bird

1 cubic metre/kg/hour	= 16.016 cubic feet/lb/hour
1 cubic foot/lb/hour	= 0.0624 cubic metre/kg/hour

°F = 9/5°C + 32 °C = 5/9 (°F-32)

45 °C = 113 °F	22 °C = 72 °F	10 °C = 50 °F
40 °C = 104 °F	20 °C = 68 °F	8 °C = 46 °F
35 °C = 95 °F	18 °C = 64 °F	6 °C = 43 °F
30 °C = 86 °F	16 °C = 61 °F	4 °C = 39 °F
27 °C = 81 °F	14 °C = 57 °F	2 °C = 36 °F
24 °C = 75°F	12 °C = 54 °F	0 °C = 32 °F

1 Joule per second = 1 Watt = Volt x Ampere
1 KJ = 1000 J
1 MJ = 1000 KJ
1 MJ = 239 Kcal
1 Kcal = 4.2 KJ
1 KWh = 3.6 MJ – 860 Kcal
1 BTU = 1055 J

SHAVER

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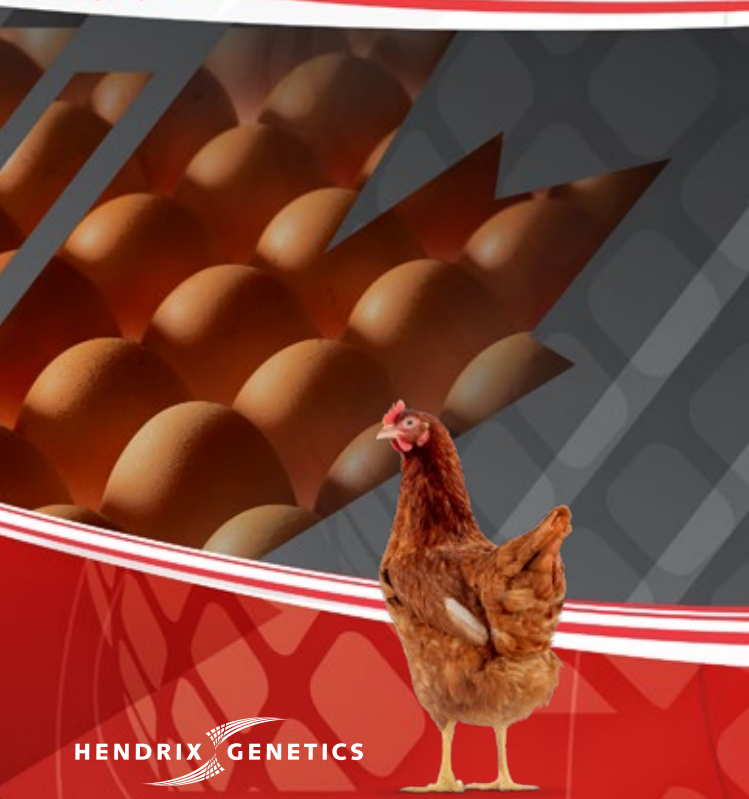

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