BOVANS®

ROBUST RESULTS

BOVANS BROWN

UK MANAGEMENT GUIDE 2026

Achieving the full genetic potential of the Bovans Brown

THE STORY OF THE BOVANS BROWN

In 1954, four Dutch laying breeding farms, facing increased competition from larger American companies, formed a new breeding company: Bovans Organisatie N.V. (Bovans Poultry Breeders).

The families were the Bongers, van Duijnhoven, van Lankveld and van der Linden (one Bo and three vans = Bovans). The founder of Bovans was Harry van Duijnhoven, together with his wife Nora.

The Bovans breeding centre was at Harry van Duijnhoven's farm at Stevensbeek. The logo of Bovans was made by the brother of Harry van Duijnhoven. Bovans Poultry Breeders soon developed into a strong and successful breeder, selling its products in Europe, South America, North Africa and the Middle East.

THE BOVANS BROWN TODAY

A balanced breeding programme has produced the Bovans Brown, a highly versatile and robust layer. High peak production, great laying persistency, and a flat egg weight curve mean the Bovans Brown produces high numbers of first quality dark brown eggs. Adaptable and easy to manage, the Bovans Brown adjusts well to different climates, management systems and housing systems, and is very successful in cage-free environments.

- **Easy to manage**
- **Impressive financial returns**
- **Excellent shell colour**

CAREFUL MANAGEMENT – THE KEY TO SUCCESS

The purpose of this management guide is to help the producer to gain the best possible results from their investment. This will be achieved by providing conditions in which the Bovans 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 Bovans 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.

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)	146
Peak production HD (%)	96.3
Liveability (16-80 weeks) (%)	96.3
Body weight at 80 weeks (g)	1940

Feed consumption in maturity (20 weeks on)

Per bird per day (g) 20-80 weeks	116.1

UK Colony	Age in weeks		
	70	80	90
No. eggs per hen housed	327	385	439
Average egg weight (g)	63.6	64.0	64.2
Egg mass HH (kg)	20.8	24.6	28.2
Feed conversion	2.0	2.0	2.0
Liveability	96.9	96.3	95.7

Performance summary

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

Age at 50% production (days)	150
Peak production HD (%)	95.6
Liveability (16-80 weeks) (%)	94.3
Body weight at 80 weeks (g)	1940

Feed consumption in maturity (20 weeks on)

Per bird per day (g) 20-80 weeks	124

UK Free Range	Age in weeks		
	70	80	90
No. eggs per hen housed	316	374	428
Average egg weight (g)	63.9	64.2	64.5
Egg mass HH (kg)	20.2	24.0	27.6
Feed conversion	2.2	2.2	2.2
Liveability	95.2	94.3	93.4

Performance data rearing period

Age (weeks)	Age (days)	Type of feed	Feed intake (g/day)	Cumulative feed intake (kg)	Body weight target (g)
1	0 → 7	Starter	11	0.1	60
2	8 → 14		17	0.2	120
3	15 → 21		25	0.4	175
4	22 → 28	Grower	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	Developer	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		76	5.5	1350
17	113 → 119	Prelay	83	6.1	1425
18	120 → 126		95	6.7	1500

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	5.0	42.5	2.1	87	0
19	25.4	45.5	11.5	101	2
20	53.1	48.5	25.7	108	6
21	76.6	51.0	39.1	111	11
22	85.5	53.5	45.7	112	17
23	90.6	55.5	50.3	112	23
24	93.6	57.5	53.8	113	30
25	94.6	59.3	56.1	113	37
26	95.1	60.6	57.6	113	43
27	95.7	61.5	58.9	114	50
28	95.8	62.1	59.5	114	57
29	95.9	62.7	60.1	114	63
30	96.0	63.0	60.5	114	70
31	96.0	63.3	60.7	115	77
32	96.2	63.5	61.1	115	83
33	96.3	63.8	61.4	115	90
34	96.3	64.0	61.6	116	97
35	96.3	64.2	61.8	116	103
36	96.2	64.4	62.0	116	110
37	96.2	64.6	62.1	116	117
38	96.2	64.7	62.2	116	123
39	96.1	64.8	62.3	116	130
40	96.1	64.9	62.3	116	136
41	96.0	65.0	62.4	116	143
42	95.9	65.0	62.3	116	150
43	95.8	65.1	62.4	116	156
44	95.6	65.1	62.2	116	163
45	95.4	65.2	62.2	116	169
46	95.3	65.2	62.1	116	176
47	95.1	65.2	62.0	116	183
48	94.9	65.3	62.0	116	189
49	94.7	65.3	61.8	116	196
50	94.5	65.4	61.8	116	202
51	94.2	65.4	61.6	116	209
52	94.0	65.4	61.5	116	215
53	93.7	65.5	61.4	116	221
54	93.5	65.5	61.2	116	228
55	93.2	65.6	61.2	116	234
56	92.9	65.6	60.9	116	241
57	92.5	65.6	60.7	116	247

Weeks	% Hen day	Egg size (g)	Egg mass (g/day)	Feed intake g/bird/day	Eggs per HH
58	92.2	65.6	60.5	116	253
59	91.9	65.6	60.3	116	259
60	91.6	65.6	60.1	116	266
61	91.2	65.7	59.9	116	272
62	90.9	65.7	59.7	116	278
63	90.5	65.7	59.5	116	284
64	90.1	65.7	59.2	116	290
65	89.8	65.8	59.1	116	297
66	89.4	65.8	58.8	116	303
67	89.1	65.8	58.6	116	309
68	88.7	65.8	58.4	116	315
69	88.4	65.9	58.3	116	321
70	88.0	65.9	58.0	116	327
71	87.7	65.9	57.8	116	333
72	87.2	65.9	57.5	116	339
73	86.9	65.9	57.2	116	344
74	86.4	66.0	57.0	116	350
75	86.1	66.0	56.8	116	356
76	85.7	66.0	56.6	116	362
77	85.3	66.0	56.3	116	368
78	84.9	66.1	56.1	116	373
79	84.5	66.1	55.8	116	379
80	84.1	66.1	55.6	116	385
81	83.5	66.1	55.2	116	390
82	82.9	66.2	54.9	116	396
83	82.4	66.2	54.5	116	402
84	81.7	66.2	54.1	116	407
85	81.1	66.2	53.7	116	412
86	80.4	66.2	53.3	116	418
87	79.7	66.3	52.9	116	423
88	79.0	66.3	52.4	116	429
89	78.2	66.3	51.8	116	434
90	77.4	66.3	51.3	116	439
91	76.5	66.4	50.8	116	444
92	75.5	66.4	50.1	116	449
93	74.5	66.4	49.5	116	454
94	73.4	66.4	48.8	116	459
95	72.3	66.5	48.1	116	464

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)
17						1425
18	0.0	0.6	41.09	41.09	0.0	1500
19	0.1	1.3	8.75	13.77	0.1	1560
20	0.3	2.1	4.20	7.52	0.1	1610
21	0.5	2.8	2.84	5.19	0.2	1665
22	0.9	3.6	2.45	4.18	0.2	1710
23	1.2	4.4	2.23	3.62	0.3	1740
24	1.6	5.2	2.09	3.26	0.4	1760
25	2.0	6.0	2.01	3.01	0.4	1770
26	2.4	6.8	1.96	2.84	0.5	1780
27	2.8	7.6	1.93	2.70	0.5	1790
28	3.2	8.4	1.91	2.60	0.6	1800
29	3.6	9.1	1.90	2.52	0.6	1810
30	4.0	9.9	1.89	2.46	0.7	1820
31	4.5	10.7	1.89	2.40	0.8	1825
32	4.9	11.5	1.88	2.36	0.8	1830
33	5.3	12.3	1.88	2.32	0.9	1835
34	5.7	13.1	1.88	2.29	0.9	1840
35	6.2	13.9	1.87	2.26	1.0	1845
36	6.6	14.7	1.87	2.23	1.1	1850
37	7.0	15.5	1.87	2.21	1.1	1852
38	7.5	16.3	1.86	2.19	1.2	1854
39	7.9	17.1	1.86	2.17	1.2	1856
40	8.3	17.9	1.86	2.16	1.3	1858
41	8.8	18.7	1.86	2.14	1.3	1860
42	9.2	19.5	1.86	2.13	1.4	1862
43	9.6	20.3	1.86	2.12	1.5	1864
44	10.0	21.1	1.86	2.11	1.5	1866
45	10.5	21.9	1.87	2.10	1.6	1870
46	10.9	22.7	1.87	2.09	1.6	1872
47	11.3	23.5	1.87	2.08	1.7	1874
48	11.8	24.3	1.87	2.07	1.7	1876
49	12.2	25.1	1.88	2.06	1.8	1878
50	12.6	25.9	1.88	2.06	1.9	1880
51	13.0	26.7	1.88	2.05	1.9	1882
52	13.4	27.5	1.89	2.05	2.0	1884
53	13.9	28.3	1.89	2.04	2.0	1886
54	14.3	29.1	1.89	2.04	2.1	1888
55	14.7	29.9	1.90	2.03	2.1	1890
56	15.1	30.7	1.90	2.03	2.2	1892

Weeks	Egg mass per HH (kg)	Feed intake (cum.) (kg)	Feed conversion (per day)	Feed conversion (cum.)	Mortality (%)	Body weight (g)
57	15.5	31.5	1.91	2.03	2.3	1894
58	16.0	32.3	1.92	2.02	2.3	1896
59	16.4	33.1	1.92	2.02	2.4	1898
60	16.8	33.9	1.93	2.02	2.4	1900
61	17.2	34.7	1.94	2.02	2.5	1902
62	17.6	35.5	1.94	2.02	2.6	1904
63	18.0	36.2	1.95	2.01	2.6	1906
64	18.4	37.0	1.96	2.01	2.7	1908
65	18.8	37.8	1.96	2.01	2.7	1910
66	19.2	38.6	1.97	2.01	2.8	1912
67	19.6	39.4	1.98	2.01	2.8	1914
68	20.0	40.2	1.99	2.01	2.9	1916
69	20.4	41.0	1.99	2.01	3.0	1918
70	20.8	41.8	2.00	2.01	3.0	1920
71	21.2	42.6	2.01	2.01	3.1	1922
72	21.6	43.3	2.02	2.01	3.1	1924
73	22.0	44.1	2.03	2.01	3.2	1926
74	22.3	44.9	2.03	2.01	3.2	1928
75	22.7	45.7	2.04	2.01	3.3	1930
76	23.1	46.5	2.05	2.01	3.4	1932
77	23.5	47.3	2.06	2.01	3.4	1934
78	23.9	48.0	2.07	2.01	3.5	1936
79	24.2	48.8	2.08	2.01	3.5	1938
80	24.6	49.6	2.09	2.02	3.6	1940
81	25.0	50.4	2.10	2.02	3.7	1942
82	25.4	51.2	2.11	2.02	3.7	1944
83	25.7	52.0	2.13	2.02	3.8	1946
84	26.1	52.7	2.14	2.02	3.8	1948
85	26.5	53.5	2.16	2.02	3.9	1950
86	26.8	54.3	2.18	2.03	3.9	1952
87	27.2	55.1	2.19	2.03	4.0	1954
88	27.5	55.9	2.22	2.03	4.1	1956
89	27.9	56.6	2.24	2.03	4.1	1958
90	28.2	57.4	2.26	2.04	4.2	1960
91	28.5	58.2	2.28	2.04	4.2	1962
92	28.9	59.0	2.31	2.04	4.3	1964
93	29.2	59.7	2.34	2.04	4.3	1966
94	29.5	60.5	2.38	2.05	4.4	1968
95	29.9	61.3	2.41	2.05	4.5	1970

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	3.0	42.5	1.3	95	0
19	10.0	45.5	4.6	108	1
20	30.0	48.5	14.6	114	3
21	49.0	51.0	25.0	118	6
22	67.0	53.5	35.8	121	11
23	82.0	55.5	45.5	123	17
24	90.0	57.5	51.8	123	23
25	93.0	59.3	55.1	124	30
26	95.0	60.6	57.6	124	36
27	95.5	61.5	58.7	124	43
28	95.6	62.1	59.4	124	49
29	95.6	62.7	59.9	124	56
30	95.6	63.0	60.2	124	63
31	95.5	63.3	60.4	124	69
32	95.5	63.5	60.6	124	76
33	95.4	63.8	60.9	124	82
34	95.4	64.0	61.0	124	89
35	95.3	64.2	61.2	124	96
36	95.2	64.4	61.3	124	102
37	95.2	64.6	61.5	124	109
38	95.1	64.7	61.5	124	115
39	95.0	64.8	61.6	124	122
40	95.0	64.9	61.6	124	128
41	94.9	65.0	61.7	124	135
42	94.8	65.0	61.6	124	141
43	94.7	65.1	61.6	124	148
44	94.6	65.1	61.6	124	154
45	94.5	65.2	61.6	124	161
46	94.4	65.2	61.5	124	167
47	94.3	65.2	61.5	124	173
48	94.1	65.3	61.5	124	180
49	94.0	65.3	61.4	124	186
50	93.9	65.4	61.4	124	193
51	93.7	65.4	61.3	124	199
52	93.6	65.4	61.2	124	205
53	93.5	65.5	61.2	124	212
54	93.3	65.5	61.1	124	218
55	93.1	65.6	61.1	124	224
56	93.0	65.6	61.0	124	230
57	92.8	65.6	60.9	124	237

Weeks	% Hen day	Egg size (g)	Egg mass (g/day)	Feed intake g/bird/day	Eggs per HH
58	92.6	65.6	60.8	124	243
59	92.4	65.6	60.6	124	249
60	92.2	65.6	60.5	125	255
61	92.0	65.7	60.4	125	262
62	91.8	65.7	60.3	125	268
63	91.5	65.7	60.1	125	274
64	91.3	65.7	60.0	125	280
65	91.0	65.8	59.9	125	286
66	90.8	65.8	59.7	125	292
67	90.5	65.8	59.6	125	298
68	90.2	65.8	59.4	125	304
69	89.9	65.9	59.3	125	310
70	89.6	65.9	59.1	125	316
71	89.3	65.9	58.8	125	322
72	89.0	65.9	58.6	125	328
73	88.6	65.9	58.4	125	334
74	88.2	66.0	58.2	125	340
75	87.8	66.0	58.0	125	346
76	87.4	66.0	57.7	125	351
77	87.0	66.0	57.4	125	357
78	86.5	66.1	57.2	125	363
79	86.1	66.1	56.9	125	369
80	85.6	66.1	56.6	125	374
81	85.1	66.1	56.2	125	380
82	84.5	66.2	56.0	125	385
83	83.9	66.2	55.6	125	391
84	83.3	66.2	55.2	125	397
85	82.7	66.2	54.7	125	402
86	82.0	66.2	54.3	125	407
87	81.3	66.3	53.9	125	413
88	80.6	66.3	53.4	125	418
89	79.8	66.3	52.9	125	423
90	78.9	66.3	52.3	125	428
91	78.0	66.4	51.8	125	433
92	77.1	66.4	51.2	125	438
93	76.1	66.4	50.5	125	443
94	75.0	66.4	49.8	125	448
95	73.8	66.5	49.1	125	453

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)
17						1425
18	0.0	0.7	74.51	74.51	0.1	1500
19	0.0	1.4	23.74	34.86	0.2	1560
20	0.1	2.2	7.84	15.57	0.3	1610
21	0.3	3.0	4.74	9.60	0.4	1665
22	0.6	3.9	3.38	6.86	0.5	1710
23	0.9	4.7	2.69	5.36	0.5	1740
24	1.2	5.6	2.38	4.50	0.6	1760
25	1.6	6.5	2.24	3.97	0.7	1770
26	2.0	7.3	2.15	3.61	0.8	1780
27	2.4	8.2	2.11	3.36	0.9	1790
28	2.8	9.0	2.09	3.18	1.0	1800
29	3.3	9.9	2.07	3.03	1.1	1810
30	3.7	10.8	2.06	2.92	1.2	1820
31	4.1	11.6	2.05	2.84	1.3	1825
32	4.5	12.5	2.05	2.76	1.4	1830
33	4.9	13.3	2.04	2.70	1.4	1835
34	5.4	14.2	2.03	2.65	1.5	1840
35	5.8	15.0	2.03	2.60	1.6	1845
36	6.2	15.9	2.02	2.56	1.7	1850
37	6.6	16.7	2.02	2.53	1.8	1852
38	7.0	17.6	2.02	2.50	1.9	1854
39	7.5	18.4	2.01	2.47	2.0	1856
40	7.9	19.3	2.01	2.45	2.1	1858
41	8.3	20.1	2.01	2.42	2.2	1860
42	8.7	21.0	2.01	2.40	2.3	1862
43	9.2	21.8	2.01	2.39	2.3	1864
44	9.6	22.7	2.01	2.37	2.4	1866
45	10.0	23.5	2.01	2.35	2.5	1870
46	10.4	24.4	2.02	2.34	2.6	1872
47	10.8	25.2	2.02	2.33	2.7	1874
48	11.2	26.1	2.02	2.32	2.8	1876
49	11.7	26.9	2.02	2.31	2.9	1878
50	12.1	27.7	2.02	2.30	3.0	1880
51	12.5	28.6	2.02	2.29	3.1	1882
52	12.9	29.4	2.03	2.28	3.2	1884
53	13.3	30.3	2.03	2.27	3.2	1886
54	13.7	31.1	2.03	2.26	3.3	1888
55	14.2	31.9	2.03	2.26	3.4	1890
56	14.6	32.8	2.04	2.25	3.5	1892

Weeks	Egg mass per HH (kg)	Feed intake (cum.) (kg)	Feed conversion (per day)	Feed conversion (cum.)	Mortality (%)	Body weight (g)
57	15.0	33.6	2.04	2.25	3.6	1894
58	15.4	34.5	2.05	2.24	3.7	1896
59	15.8	35.3	2.05	2.23	3.8	1898
60	16.2	36.1	2.06	2.23	3.9	1900
61	16.6	37.0	2.06	2.23	4.0	1902
62	17.0	37.8	2.07	2.22	4.1	1904
63	17.4	38.7	2.07	2.22	4.1	1906
64	17.8	39.5	2.08	2.22	4.2	1908
65	18.2	40.3	2.08	2.21	4.3	1910
66	18.6	41.2	2.09	2.21	4.4	1912
67	19.0	42.0	2.10	2.21	4.5	1914
68	19.4	42.8	2.10	2.21	4.6	1916
69	19.8	43.7	2.11	2.20	4.7	1918
70	20.2	44.5	2.12	2.20	4.8	1920
71	20.6	45.3	2.12	2.20	4.9	1922
72	21.0	46.2	2.13	2.20	5.0	1924
73	21.4	47.0	2.14	2.20	5.0	1926
74	21.8	47.8	2.15	2.20	5.1	1928
75	22.1	48.6	2.16	2.20	5.2	1930
76	22.5	49.5	2.17	2.20	5.3	1932
77	22.9	50.3	2.18	2.20	5.4	1934
78	23.3	51.1	2.19	2.20	5.5	1936
79	23.7	52.0	2.20	2.20	5.6	1938
80	24.0	52.8	2.21	2.20	5.7	1940
81	24.4	53.6	2.22	2.20	5.8	1942
82	24.8	54.4	2.23	2.20	5.9	1944
83	25.1	55.3	2.25	2.20	5.9	1946
84	25.5	56.1	2.27	2.20	6.0	1948
85	25.9	56.9	2.28	2.20	6.1	1950
86	26.2	57.7	2.30	2.20	6.2	1952
87	26.6	58.5	2.32	2.20	6.3	1954
88	26.9	59.4	2.34	2.20	6.4	1956
89	27.3	60.2	2.36	2.21	6.5	1958
90	27.6	61.0	2.39	2.21	6.6	1960
91	28.0	61.8	2.41	2.21	6.7	1962
92	28.3	62.6	2.44	2.21	6.8	1964
93	28.6	63.4	2.47	2.22	6.9	1966
94	28.9	64.3	2.51	2.22	7.0	1968
95	29.3	65.1	2.55	2.22	7.1	1970

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	2.4%	5.9%	7.3%	7.9%	8.9%	9.6%
L	63-73	47.6%	58.3%	60.4%	61.1%	62.0%	62.5%
M	53-63	47.6%	34.6%	31.4%	30.2%	28.4%	27.2%
S	<53	2.4%	1.1%	0.9%	0.8%	0.7%	0.7%

% 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

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.
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.

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

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.

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

UK Free Range recommendations

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.
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.

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

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	10.000	10.000	10.000
Vitamin D3	IU	3.000	2.000	2.500
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

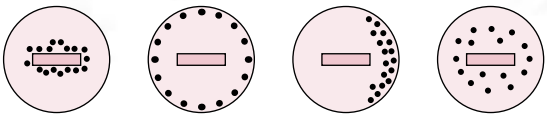
Rearing period

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.



Too cold Too warm Draught Ideal

- 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/m²
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.

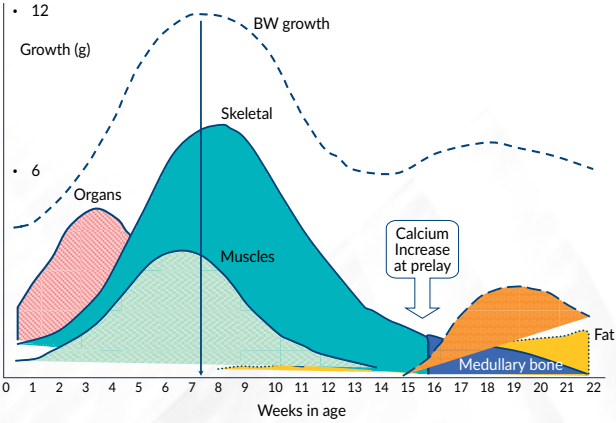
Therefore, for a windowless house, it is also necessary to adapt the standard lighting programme to the hatch season. Flocks hatched in the 'off season', with reduced day length should be light stimulated earlier than those reared in the increasing day length season.

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 day's 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	83
1500	18	start layer diet	12	87	95
1560	19	first egg	13	101	108
1610	20	±35% production	14	108	114
1665	21	65% production	14-16	111	118
1710	22	85% production	14-16	112	121
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 fine 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.

Bovans Brown 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.

Flocks should be light stimulated at 1300g body weight. Very uniform flocks for medium egg production may be stimulated at 1260g.

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

WARRANTY DISCLAIMER

The information supplied in this guide is based on many actual flock results obtained under good environmental and management conditions. It is presented as a service to our customers and should be used as a guide only. It does not constitute a guarantee or warranty of performance in any way.

The data contained in this guide should therefore be regarded not as a specification of standards but as performance objectives. All the programmes outlined in this text are supplied as recommendations only and should be modified to match specific circumstances according to the situation.

Our technical staff are of course available to assist you in determining the proper programme for your poultry operation. Please do not hesitate to contact us if you have any queries.

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www.bovans.com

Joice and Hill Poultry
The Hatchery, Green Road, Eye,
Peterborough, PE6 7YP

Tel: 01733 221833
www.joiceandhill.co.uk

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