

Hy-Line[®]

PINK



Performance Guide



Use of the Performance Guide

The genetic potential of Hy-Line Pink Commercial can only be realized if good poultry husbandry practices and management are used. This management guide outlines successful flock management programmes for Hy-Line Variety Pink Commercial based on field experience compiled by Hy-Line International and using an extensive commercial layer flock database of Hy-Line flocks from all parts of the world. Hy-Line International Management Guides are periodically updated as new performance data and/or nutrition information become available.

The information and suggestions contained in this management guide should be used for guidance and educational purposes only, recognising that local environmental and disease conditions may vary and a guide cannot cover all possible circumstances. While every attempt has been made to ensure that the information presented is accurate and reliable at the time of publication, Hy-Line International cannot accept responsibility for any errors, omissions or inaccuracies in such information or management suggestions. Further, Hy-Line International does not warrant or make any representations or guarantees regarding the use, validity, accuracy, or reliability of, or flock performance or productivity resulting from the use of, or otherwise respecting, such information or management suggestions. In no event shall Hy-Line International be liable for any special, indirect or consequential damages or special damages whatsoever arising out of or in connection with the use of the information or management suggestions contained in this management guide.

Always consult hyline.com for the latest performance, nutrition, and management information.



**Hy-Line Pink
Online Management Guide**

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Summary of Performance Standards

REARING PERIOD (TO 17 WEEKS):	
Livability	98%
Feed Consumed	5.48–6.46 kg
Body Weight at 18 Weeks	1450–1550 g
LAYING PERIOD (TO 100 WEEKS):	
Percent Peak	95.0–96.8%
Hen-Day Eggs to 60 Weeks	260.5–269.6
Hen-Day Eggs to 100 Weeks	488.2–509.1
Hen-Housed Eggs to 60 Weeks	257.2–266.1
Hen-Housed Eggs to 100 Weeks	472.8–493.0
Livability to 60 Weeks	97.22%
Livability to 100 Weeks	91.70%
Days to 50% Production (from hatch)	141
Average Egg Weight at 26 Weeks	56.1–57.9 g/egg
Average Egg Weight at 32 Weeks	59.8–61.6 g/egg
Average Egg Weight at 70 Weeks	63.3–65.3 g/egg
Average Egg Weight at 100 Weeks	63.8–65.8 g/egg
Total Egg Mass per Hen-Housed (18–80 weeks)	23.1–23.9 kg
Total Egg Mass per Hen-Housed (18–100 weeks)	29.6–30.8 kg
Body Weight at 26 Weeks	1783–1985 g
Body Weight at 32 Weeks	1865–1975 g
Body Weight at 70 Weeks	1910–2010 g
Body Weight at 100 Weeks	1910–2010 g
Freedom From Egg Inclusions	Excellent
Shell Strength	Excellent
Shell Color at 38 Weeks	46
Shell Color at 56 Weeks	43
Shell Color at 70 Weeks	41
Haugh Units at 38 Weeks	93.0
Haugh Units at 56 Weeks	86.9
Haugh Units at 70 Weeks	83.0
Average Daily Feed Consumption (19–100 weeks)	104.6–112.4 g/day per bird
Feed Conversion Rate, kg Feed/kg Eggs (20–60 weeks)	1.98–2.06
Feed Conversion Rate, kg Feed/kg Eggs (20–100 weeks)	2.04–2.12
Feed Utilization, kg Egg/kg Feed (20–60 weeks)	0.49–0.50
Feed Utilization, kg Egg/kg Feed (20–100 weeks)	0.47–0.49
Feed Consumption per Dozen Eggs (20–60 weeks)	1.43–1.49 kg
Feed Consumption per Dozen Eggs (20–100 weeks)	1.48–1.54 kg
Skin Color	Yellow
Condition of Droppings	Dry

Performance Summary data is based on results obtained from customers around the world.

Please send your results to info@hyline.com. An easy to use record-keeping program,

Hy-Line International EggCel, can be found at www.hyline.com.

Rearing Period Performance Table

AGE (weeks)	MORTALITY Cumulative (%)	BODY WEIGHT (g)	FEED INTAKE (g / bird per day)	CUMULATIVE FEED INTAKE (g to date)	WATER CONSUMP- TION (ml / bird/ day)	UNIFORMITY (Cage)
1	0.5	70 – 80	14 – 17	100 – 120	21 – 33	>85%
2	0.7	120 – 130	16 – 20	210 – 260	25 – 41	
3	0.8	190 – 200	20 – 25	360 – 430	30 – 51	
4	0.9	270 – 280	26 – 31	530 – 650	38 – 61	
5	1.0	360 – 375	30 – 38	750 – 910	45 – 75	>80%
6	1.1	460 – 480	35 – 44	990 – 1220	53 – 88	
7	1.2	560 – 588	41 – 49	1280 – 1560	62 – 98	
8	1.2	660 – 696	46 – 55	1600 – 1950	69 – 110	
9	1.3	760 – 804	51 – 60	1960 – 2370	76 – 119	
10	1.3	860 – 908	55 – 63	2340 – 2810	83 – 126	
11	1.4	950 – 1006	58 – 67	2750 – 3280	87 – 133	
12	1.5	1035 – 1096	60 – 70	3170 – 3760	90 – 140	
13	1.6	1115 – 1181	62 – 72	3610 – 4270	93 – 144	>85%
14	1.7	1190 – 1261	64 – 75	4060 – 4790	96 – 149	
15	1.8	1260 – 1336	66 – 76	4520 – 5320	98 – 153	
16	1.9	1325 – 1409	67 – 79	4990 – 5880	101 – 158	
17	2.0	1388 – 1480	70 – 83	5480 – 6460	105 – 165	>90%

Production Period Performance Table

AGE (weeks)	% HEN-DAY Current	HEN-DAY EGGS Cumulative	HEN- HOUSED EGGS Cumulative	MORT- ALITY Cumulative (%)	BODY WEIGHT (g)	FEED INTAKE (g / bird / day)	WATER CONSUMP- TION (ml / bird / day)	HEN- HOUSED EGG MASS Cumulative (kg)	AVG. EGG WEIGHT (g / egg)
18	2.0–6.0	0.1 – 0.4	0.1–0.4	0.10	1450 – 1550	73–87	110 – 174	0.0–0.0	44.3 – 45.7
19	13.0–25.0	1.1 – 2.2	1.0–2.2	0.10	1510 – 1615	80–89	120 – 178	0.0–0.1	45.8 – 47.2
20	40.0–50.0	3.9 – 5.7	3.8–5.7	0.20	1568 – 1675	85–93	128 – 186	0.2–0.3	47.3 – 48.7
21	65.0–76.0	8.4 – 11.0	8.4–11.0	0.20	1623 – 1730	90–98	135 – 196	0.4–0.5	48.8 – 50.2
22	80.0–85.0	14.0 – 16.9	14.0–16.9	0.30	1673 – 1780	95–103	143 – 206	0.7–0.8	50.2 – 51.8
23	88.0–92.0	20.2 – 23.4	20.1–23.3	0.30	1713 – 1820	98–107	147 – 214	1.0–1.2	51.7 – 53.3
24	91.0–93.5	26.5 – 29.9	26.5–29.8	0.40	1743 – 1855	101–109	152 – 218	1.4–1.5	53.2 – 54.8
25	93.0–95.0	33.0 – 36.6	32.9–36.5	0.40	1763 – 1875	104–111	156 – 222	1.7–1.9	55.2 – 56.8
26	94.7–96.3	39.7 – 43.3	39.5–43.2	0.50	1783 – 1895	105–112	158 – 224	2.1–2.3	56.1 – 57.9
27	94.8–96.6	46.3 – 50.1	46.1–49.9	0.50	1803 – 1915	106–113	159 – 226	2.5–2.7	57.2 – 59.0
28	94.9–96.8	52.9 – 56.9	52.7–56.6	0.60	1823 – 1930	106–113	159 – 226	2.9–3.1	58.1 – 59.9
29	95.0–96.8	59.6 – 63.6	59.3–63.4	0.60	1833 – 1945	106–114	159 – 228	3.3–3.5	58.6 – 60.4
30	94.9–96.7	66.2 – 70.4	65.9–70.1	0.70	1843 – 1955	106–114	159 – 228	3.7–3.9	59.1 – 60.9
31	94.8–96.6	72.9 – 77.2	72.5–76.8	0.70	1853 – 1965	106–114	159 – 228	4.1–4.3	59.5 – 61.3
32	94.7–96.5	79.5 – 83.9	79.1–83.5	0.80	1865 – 1975	106–114	159 – 228	4.5–4.7	59.8 – 61.6
33	94.5–96.4	86.1 – 90.7	85.7–90.2	0.80	1865 – 1975	106–114	159 – 228	4.9–5.1	60.1 – 61.9
34	94.4–96.3	92.7 – 97.4	92.2–96.9	0.90	1865 – 1975	106–114	159 – 228	5.3–5.5	60.4 – 62.2
35	94.3–96.2	99.3 – 104.1	98.8–103.6	0.90	1865 – 1975	106–114	159 – 228	5.7–5.9	60.7 – 62.5
36	94.2–96.1	105.9 – 110.9	105.3–110.2	1.00	1875 – 1985	106–113	159 – 226	6.1–6.3	60.9 – 62.7
37	94.0–96.0	112.5 – 117.6	111.8–116.9	1.00	1875 – 1985	106–113	159 – 226	6.5–6.7	61.1 – 62.9
38	93.8–95.8	119.1 – 124.3	118.3–123.5	1.10	1875 – 1985	106–113	159 – 226	6.9–7.2	61.3 – 63.1
39	93.7–95.7	125.6 – 131.0	124.8–130.1	1.10	1875 – 1985	106–113	159 – 226	7.3–7.6	61.4 – 63.2
40	93.5–95.5	132.2 – 137.7	131.2–136.7	1.20	1885 – 1995	106–114	159 – 228	7.7–8.0	61.5 – 63.3
41	93.4–95.5	138.7 – 144.4	137.7–143.3	1.20	1885 – 1995	106–113	159 – 226	8.1–8.4	61.6 – 63.4
42	93.3–95.4	145.2 – 151.0	144.1–149.9	1.30	1885 – 1995	106–113	159 – 226	8.5–8.8	61.7 – 63.5
43	93.1–95.4	151.7 – 157.7	150.6–156.5	1.30	1885 – 1995	106–113	159 – 226	8.9–9.2	61.8 – 63.6
44	93.0–95.3	158.3 – 164.4	157.0–163.1	1.40	1895 – 2000	106–113	159 – 226	9.3–9.6	61.9 – 63.7
45	92.8–95.2	164.8 – 171.0	163.4–169.7	1.40	1895 – 2000	106–113	159 – 226	9.7–10.0	62.0 – 63.8
46	92.7–95.0	171.2 – 177.7	169.8–176.2	1.50	1895 – 2000	106–113	159 – 226	10.1–10.5	62.1 – 63.9
47	92.4–94.9	177.7 – 184.3	176.2–182.7	1.50	1895 – 2000	106–113	159 – 226	10.5–10.9	62.2 – 64.0
48	92.3–94.7	184.2 – 191.0	182.5–189.3	1.60	1905 – 2005	106–113	159 – 226	10.9–11.3	62.3 – 64.1
49	92.1–94.6	190.6 – 197.6	188.9–195.8	1.70	1905 – 2005	106–113	159 – 226	11.3–11.7	62.4 – 64.2
50	92.0–94.4	197.1 – 204.2	195.2–202.3	1.80	1905 – 2005	106–113	159 – 226	11.7–12.1	62.4 – 64.4
51	91.6–94.3	203.5 – 210.8	201.5–208.7	1.89	1905 – 2005	106–113	159 – 226	12.1–12.5	62.4 – 64.4
52	91.5–94.1	209.9 – 217.4	207.8–215.2	1.99	1910 – 2010	106–113	159 – 226	12.5–12.9	62.5 – 64.5
53	91.3–94.0	216.3 – 223.9	214.0–221.6	2.09	1910 – 2010	106–113	159 – 226	12.9–13.3	62.5 – 64.5
54	91.1–93.7	222.7 – 230.5	220.3–228.1	2.19	1910 – 2010	106–113	159 – 226	13.3–13.7	62.6 – 64.6
55	90.9–93.5	229.0 – 237.1	226.5–234.4	2.29	1910 – 2010	106–113	159 – 226	13.7–14.2	62.6 – 64.6
56	90.6–93.3	235.4 – 243.6	232.7–240.8	2.39	1910 – 2010	106–113	159 – 226	14.1–14.6	62.7 – 64.7
57	90.4–93.1	241.7 – 250.1	238.8–247.2	2.48	1910 – 2010	106–113	159 – 226	14.5–15.0	62.7 – 64.7
58	90.1–92.9	248.0 – 256.6	245.0–253.5	2.58	1910 – 2010	106–113	159 – 226	14.9–15.4	62.8 – 64.8
59	89.9–92.7	254.3 – 263.1	251.1–259.8	2.68	1910 – 2010	106–113	159 – 226	15.3–15.8	62.8 – 64.8
60	89.5–92.5	260.5 – 269.6	257.2–266.1	2.78	1910 – 2010	106–113	159 – 226	15.7–16.2	62.9 – 64.9
61	89.3–92.3	266.8 – 276.0	263.3–272.4	2.87	1910 – 2010	106–113	159 – 226	16.1–16.6	62.9 – 64.9
62	89.0–92.1	273.0 – 282.5	269.3–278.7	2.97	1910 – 2010	106–113	159 – 226	16.4–17.0	63.0 – 65.0

Production Period Performance Table (cont.)

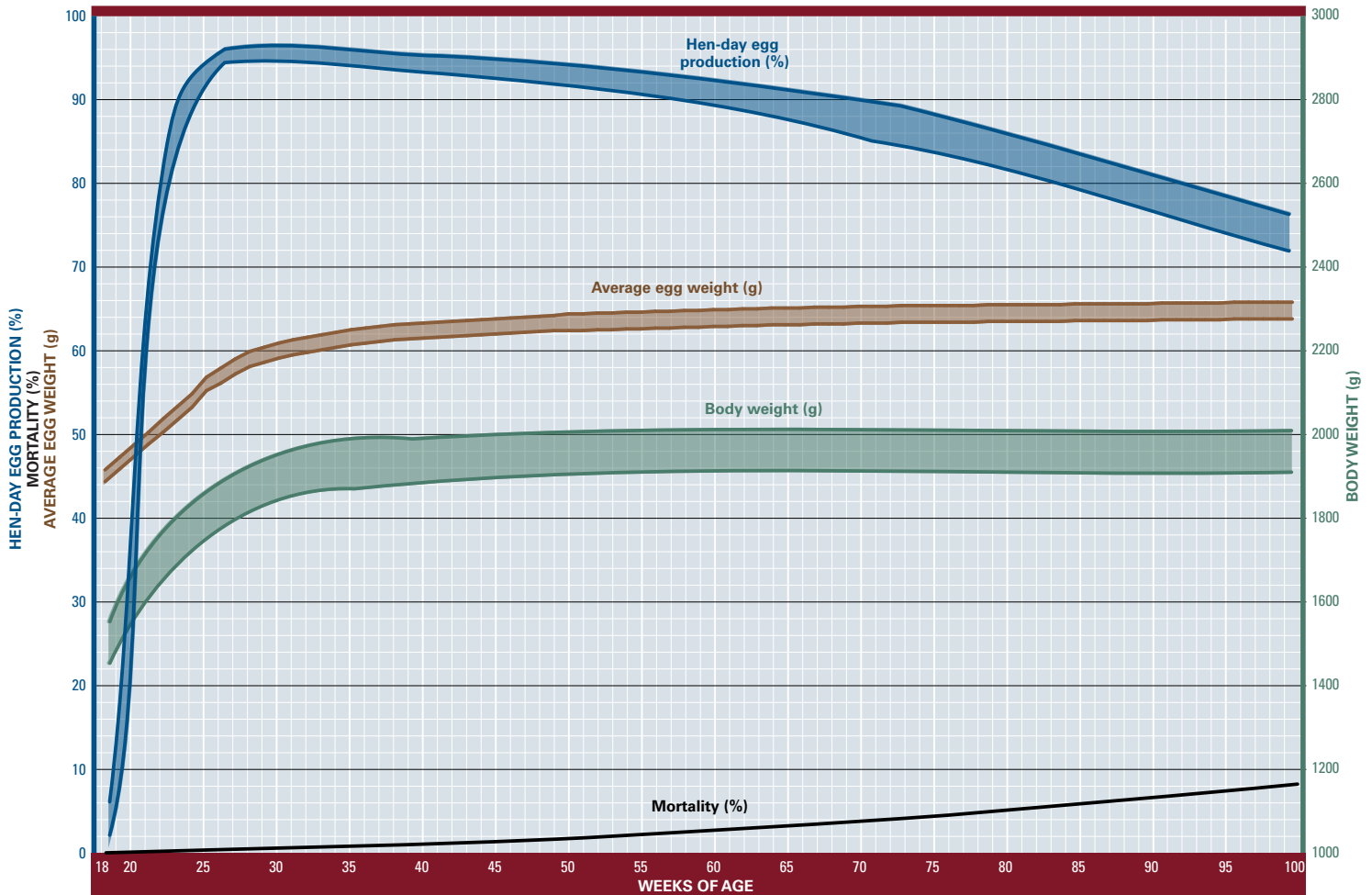
AGE (weeks)	% HEN-DAY Current	HEN-DAY EGGS Cumulative	HEN- HOUSED EGGS Cumulative	MORT- ALITY Cumulative (%)	BODY WEIGHT (g)	FEED INTAKE (g / bird / day)	WATER CONSUMP- TION (ml / bird / day)	HEN- HOUSED EGG MASS Cumulative (kg)	AVG. EGG WEIGHT (g / egg)
63	88.7–91.9	279.2 – 288.9	275.3–284.9	3.07	1910 – 2010	106–113	159 – 226	16.8–17.4	63.0 – 65.0
64	88.4–91.7	285.4 – 295.3	281.3–291.1	3.16	1910 – 2010	106–113	159 – 226	17.2–17.8	63.1 – 65.1
65	88.0–91.5	291.6 – 301.7	287.3–297.3	3.36	1910 – 2010	106–113	159 – 226	17.6–18.2	63.1 – 65.1
66	87.5–91.2	297.7 – 308.1	293.2–303.5	3.46	1910 – 2010	106–113	159 – 226	18.0–18.6	63.1 – 65.1
67	87.1–91.0	303.8 – 314.5	299.1–309.6	3.55	1910 – 2010	106–113	159 – 226	18.4–19.0	63.2 – 65.2
68	86.7–90.8	309.9 – 320.9	304.9–315.7	3.65	1910 – 2010	106–113	159 – 226	18.7–19.4	63.2 – 65.2
69	86.3–90.6	315.9 – 327.2	310.7–321.8	3.74	1910 – 2010	106–113	159 – 226	19.1–19.8	63.2 – 65.2
70	85.8–90.3	321.9 – 333.5	316.5–327.9	3.94	1910 – 2010	106–113	159 – 226	19.5–20.1	63.3 – 65.3
71	85.3–90.1	327.9 – 339.8	322.2–334.0	4.03	1910 – 2010	106–113	159 – 226	19.8–20.5	63.3 – 65.3
72	85.0–89.8	333.8 – 346.1	327.9–340.0	4.13	1910 – 2010	106–113	159 – 226	20.2–20.9	63.3 – 65.3
73	84.9–89.5	339.8 – 352.4	333.6–346.0	4.23	1910 – 2010	106–113	159 – 226	20.6–21.3	63.4 – 65.4
74	84.5–89.1	345.7 – 358.6	339.3–352.0	4.32	1910 – 2010	106–113	159 – 226	20.9–21.7	63.4 – 65.4
75	84.2–88.7	351.6 – 364.8	344.9–357.9	4.51	1910 – 2010	106–113	159 – 226	21.3–22.1	63.4 – 65.4
76	83.7–88.3	357.5 – 371.0	350.5–363.8	4.61	1910 – 2010	106–113	159 – 226	21.7–22.5	63.4 – 65.4
77	83.3–87.7	363.3 – 377.1	356.0–369.6	4.80	1910 – 2010	106–113	159 – 226	22.0–22.8	63.4 – 65.4
78	82.9–87.3	369.1 – 383.2	361.6–375.4	4.90	1910 – 2010	106–113	159 – 226	22.4–23.2	63.4 – 65.4
79	82.4–86.8	374.9 – 389.3	367.0–381.2	4.99	1910 – 2010	106–113	159 – 226	22.7–23.6	63.5 – 65.5
80	82.0–86.3	380.6 – 395.4	372.5–386.9	5.18	1910 – 2010	106–113	159 – 226	23.1–23.9	63.5 – 65.5
81	81.6–85.8	386.3 – 401.4	377.9–392.6	5.28	1910 – 2010	106–113	159 – 226	23.4–24.3	63.5 – 65.5
82	81.1–85.4	392.0 – 407.3	383.3–398.3	5.47	1910 – 2010	106–113	159 – 226	23.8–24.7	63.5 – 65.5
83	80.7–84.9	397.6 – 413.3	388.6–403.9	5.66	1910 – 2010	106–113	159 – 226	24.1–25.0	63.5 – 65.5
84	80.1–84.4	403.2 – 419.2	393.9–409.5	5.75	1910 – 2010	106–113	159 – 226	24.5–25.4	63.5 – 65.5
85	79.6–83.9	408.8 – 425.1	399.1–415.0	5.94	1910 – 2010	106–113	159 – 226	24.8–25.8	63.6 – 65.6
86	79.0–83.5	414.3 – 430.9	404.3–420.5	6.04	1910 – 2010	106–113	159 – 226	25.1–26.1	63.6 – 65.6
87	78.6–83.0	419.8 – 436.7	409.5–425.9	6.23	1910 – 2010	106–113	159 – 226	25.5–26.5	63.6 – 65.6
88	78.1–82.5	425.3 – 442.5	414.6–431.3	6.51	1910 – 2010	106–113	159 – 226	25.8–26.8	63.6 – 65.6
89	77.6–82.0	430.7 – 448.3	419.7–436.7	6.52	1910 – 2010	106–113	159 – 226	26.1–27.2	63.6 – 65.6
90	77.1–81.5	436.1 – 454.0	424.7–442.0	6.70	1910 – 2010	106–113	159 – 226	26.5–27.5	63.6 – 65.6
91	76.6–81.0	441.5 – 459.6	429.7–447.3	6.89	1910 – 2010	106–113	159 – 226	26.8–27.8	63.7 – 65.7
92	76.1–80.5	446.8 – 465.3	434.7–452.5	6.98	1910 – 2010	106–113	159 – 226	27.1–28.2	63.7 – 65.7
93	75.7–80.0	452.1 – 470.9	439.6–457.7	7.17	1910 – 2010	106–113	159 – 226	27.4–28.5	63.7 – 65.7
94	75.1–79.5	457.4 – 476.4	444.4–462.9	7.36	1910 – 2010	106–113	159 – 226	27.7–28.9	63.7 – 65.7
95	74.7–79.0	462.6 – 482.0	449.3–468.0	7.45	1910 – 2010	106–113	159 – 226	28.0–29.2	63.7 – 65.7
96	74.0–78.5	467.8 – 487.5	454.1–473.1	7.64	1910 – 2010	106–113	159 – 226	28.4–29.5	63.8 – 65.8
97	73.6–78.0	473.0 – 492.9	458.8–478.1	7.83	1910 – 2010	106–113	159 – 226	28.7–29.8	63.8 – 65.8
98	73.1–77.5	478.1 – 498.3	463.5–483.1	7.92	1910 – 2010	106–113	159 – 226	29.0–30.2	63.8 – 65.8
99	72.6–77.0	483.2 – 503.7	468.2–488.1	8.11	1910 – 2010	106–113	159 – 226	29.3–30.5	63.8 – 65.8
100	72.1–76.5	488.2 – 509.1	472.8–493.0	8.30	1910 – 2010	106–113	159 – 226	29.6–30.8	63.8 – 65.8

Production Period Space Recommendations

check local regulations concerning space requirements)

WEEKS OF AGE															
31720304050607080															
CONVENTIONAL AND COLONY CAGES															
Floor Space															
100–200 cm ² (50–100 birds / m ²)								310 cm ² (32 birds / m ²)				490 cm ² (20 birds / m ²) – 750 cm ² (13 birds / m ²)			
Nipple/Cup															
1 / 12 birds								1 / 8 birds				1 / 12 birds or access to 2 drinkers			
Feeders															
5 cm / bird								8 cm / bird				7–12 cm / bird			

Performance Graph



Egg Quality and Egg Size Distribution

Egg Quality

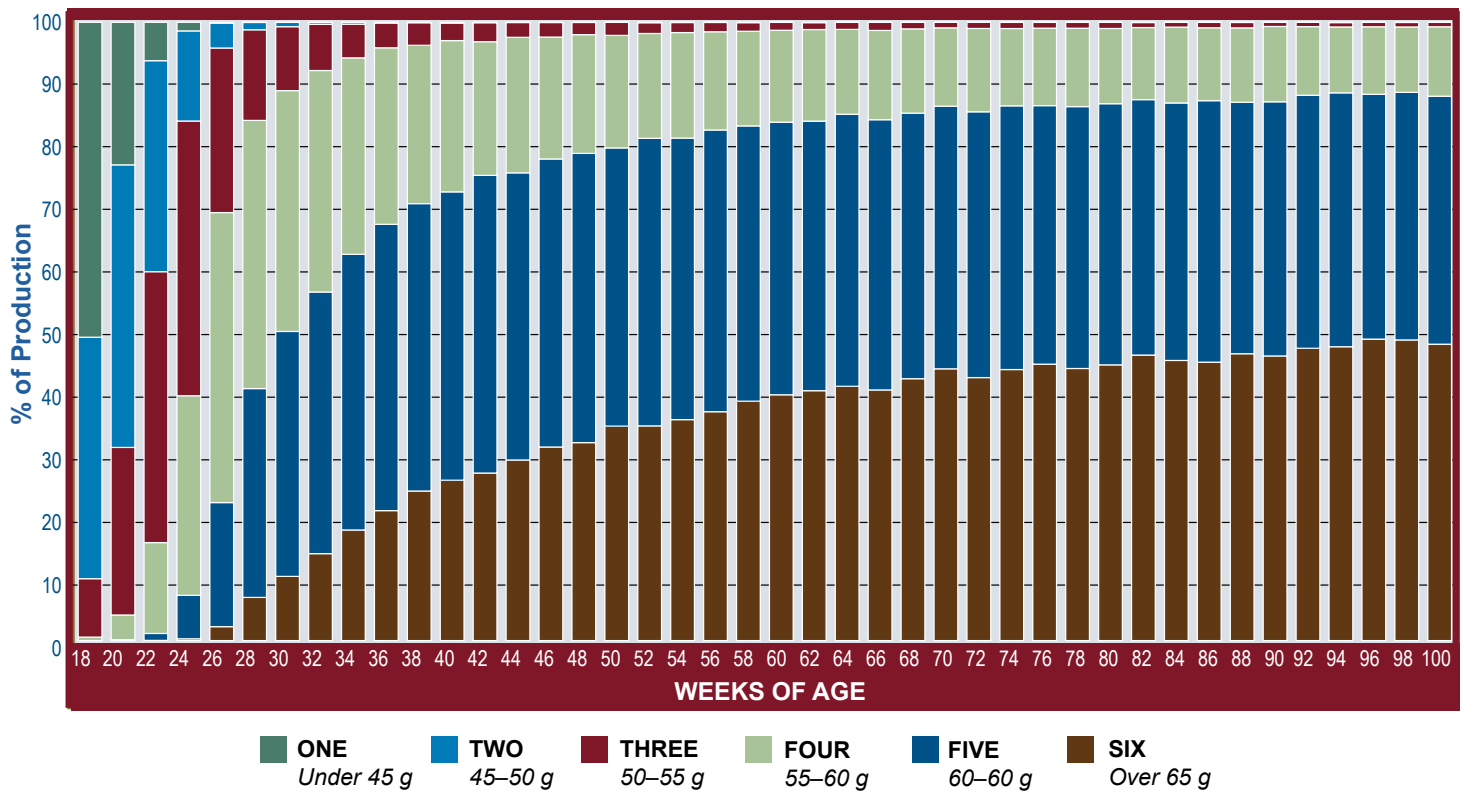
AGE (weeks)	HAUGH UNITS	BREAKING STRENGTH	SHELL COLOR
20	98.1	4440	50
22	97.5	4450	50
24	97.1	4460	49
26	96.7	4440	49
28	96.3	4420	48
30	95.9	4400	48
32	95.2	4380	48
34	94.5	4360	47
36	93.7	4340	47
38	93.0	4320	46
40	92.2	4300	46
42	91.5	4280	46
44	90.7	4260	45
46	90.0	4240	45
48	89.4	4220	44
50	88.7	4200	44
52	88.1	4180	44
54	87.4	4160	44
56	86.9	4140	43
58	86.3	4120	43
60	85.7	4100	43
62	85.2	4080	42
64	84.7	4060	42
66	84.1	4040	42
68	83.5	4020	41
70	83.0	4000	41
72	82.6	3980	41
74	82.1	3960	40
76	81.7	3940	40
78	81.2	3920	40
80	80.8	3900	40
82	80.4	3880	39
84	80.0	3860	39
86	79.6	3840	38
88	79.2	3820	38
90	78.8	3800	38

Egg Size Distribution—Chinese Standards

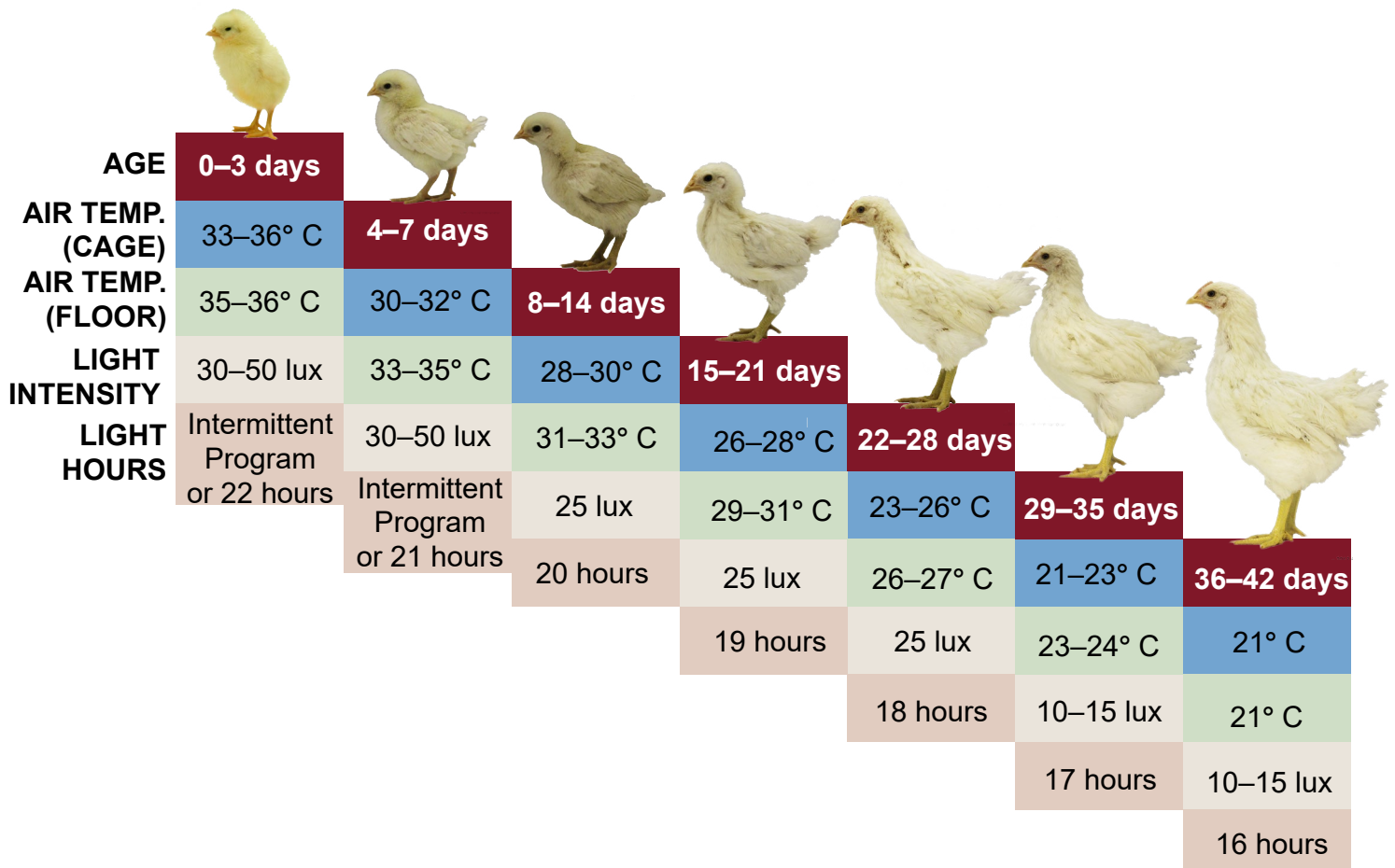
AGE (weeks)	AVERAGE EGG WEIGHT (g)	% ONE Under 45 g	% TWO 45–50 g	% THREE 50–55 g	% FOUR 55–60 g	% FIVE 60–65 g	% SIX Over 65 g
18	45.0	50.93	39.06	9.45	0.55	0.01	0.00
20	48.0	23.05	45.71	27.10	4.00	0.14	0.00
22	51.0	6.20	34.13	43.82	14.70	1.12	0.03
24	54.0	1.38	14.58	44.43	32.29	7.03	0.29
26	57.0	0.12	4.03	26.62	46.91	20.07	2.25
28	59.0	0.02	1.18	14.66	43.38	33.78	6.98
30	60.0	0.01	0.69	10.34	38.96	39.62	10.38
32	60.7	0.01	0.30	7.48	35.83	42.32	14.06
34	61.3	0.00	0.29	5.45	31.78	44.59	17.89
36	61.8	0.00	0.11	4.00	28.56	46.31	21.02
38	62.2	0.00	0.06	3.65	25.61	46.49	24.19
40	62.4	0.09	0.00	2.86	24.47	46.64	25.94
42	62.6	0.00	0.06	3.07	21.62	48.15	27.10
44	62.8	0.00	0.03	2.39	21.92	46.45	29.21
46	63.0	0.00	0.03	2.35	19.72	46.59	31.31
48	63.2	0.00	0.02	1.97	19.21	46.78	32.02
50	63.4	0.00	0.01	2.10	18.20	45.00	34.69
52	63.5	0.00	0.06	1.74	16.96	46.51	34.73
54	63.6	0.00	0.03	1.62	17.07	45.54	35.74
56	63.7	0.00	0.02	1.50	15.89	45.57	37.02
58	63.8	0.00	0.05	1.39	15.31	44.53	38.72
60	63.9	0.00	0.01	1.27	14.87	44.09	39.76
62	64.0	0.00	0.05	1.11	14.82	43.60	40.42
64	64.1	0.00	0.01	1.13	13.72	44.01	41.13
66	64.1	0.00	0.00	1.31	14.44	43.71	40.54
68	64.2	0.00	0.01	1.04	13.64	42.95	42.36
70	64.3	0.00	0.00	0.88	12.68	42.48	43.96
72	64.3	0.00	0.00	0.99	13.48	42.99	42.54
74	64.4	0.00	0.01	0.99	12.50	42.66	43.84
76	64.4	0.00	0.01	0.93	12.53	41.82	44.71
78	64.4	0.00	0.01	0.94	12.68	42.36	44.01
80	64.5	0.00	0.00	0.99	12.17	42.24	44.60
82	64.5	0.00	0.03	0.81	11.66	41.32	46.18
84	64.5	0.00	0.01	0.76	12.27	41.65	45.31
86	64.6	0.00	0.01	0.86	11.80	42.30	45.03
88	64.6	0.00	0.02	0.87	12.04	40.67	46.40
90	64.6	0.00	0.01	0.66	12.18	41.11	46.04
92	64.7	0.00	0.00	0.69	11.10	40.93	47.28
94	64.7	0.00	0.04	0.70	10.66	41.07	47.53
96	64.8	0.00	0.01	0.70	10.92	39.61	48.76
98	64.8	0.00	0.02	0.72	10.58	40.05	48.63
100	64.8	0.00	0.00	0.71	11.24	40.11	47.94

Egg Size Distribution (cont.)

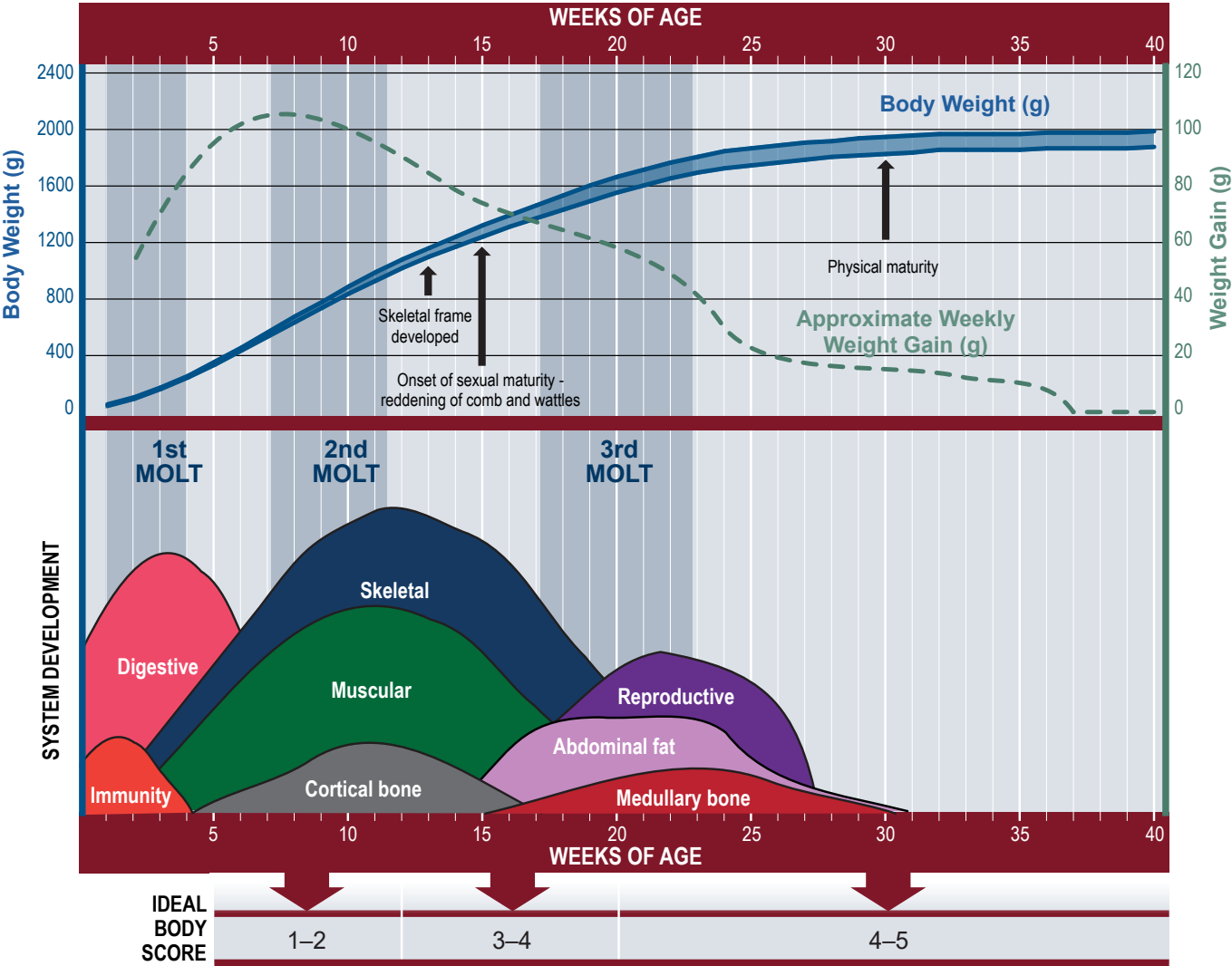
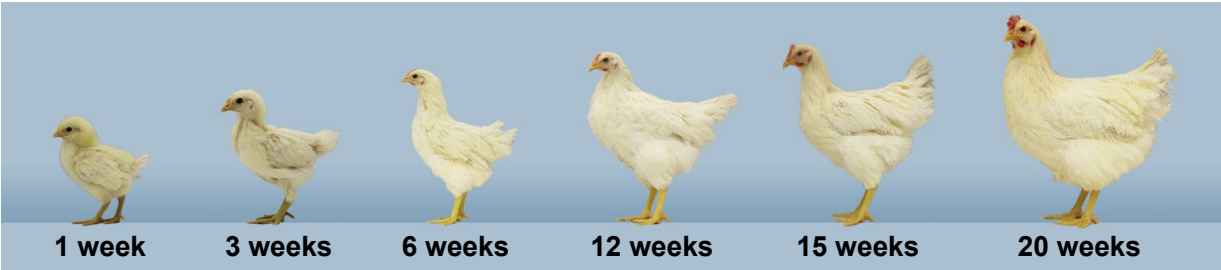
Chinese Standards



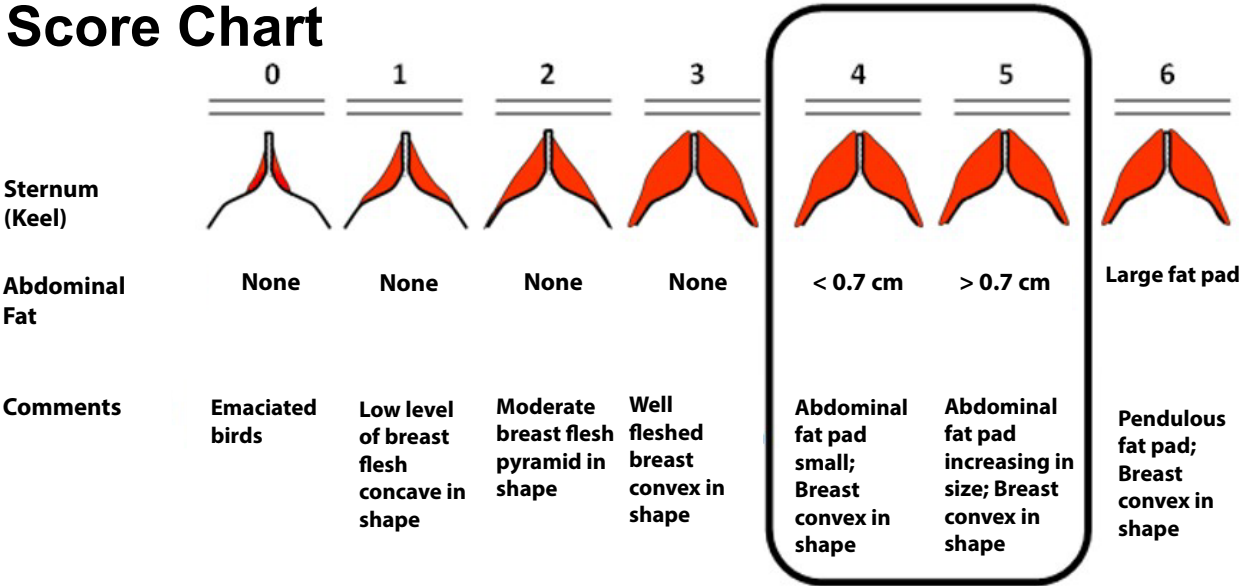
Brooding Temperature and Lighting Recommendations



Development of the Organ Systems in Pullets

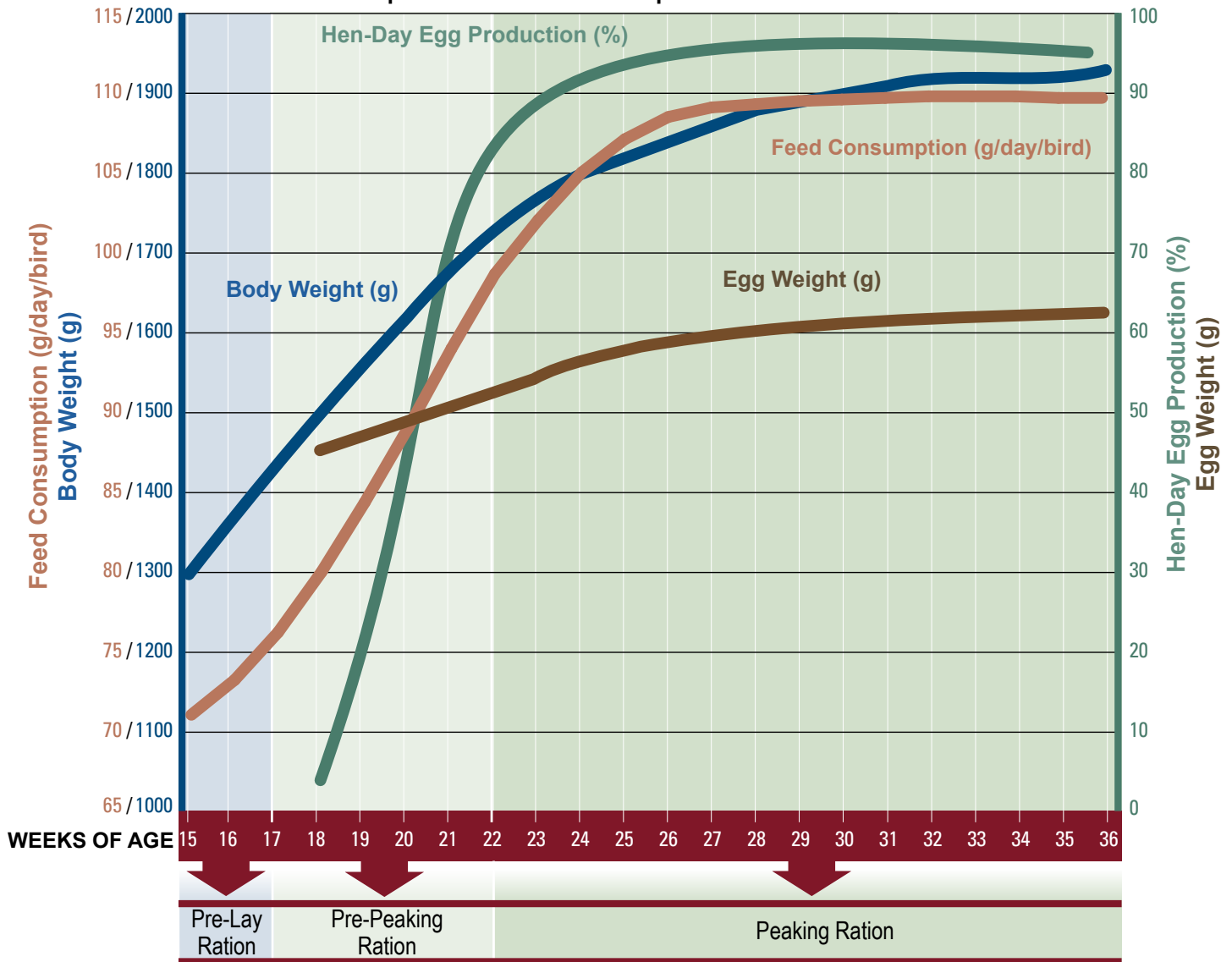


Body Score Chart



Transition Period from Rear to Peak Egg Production

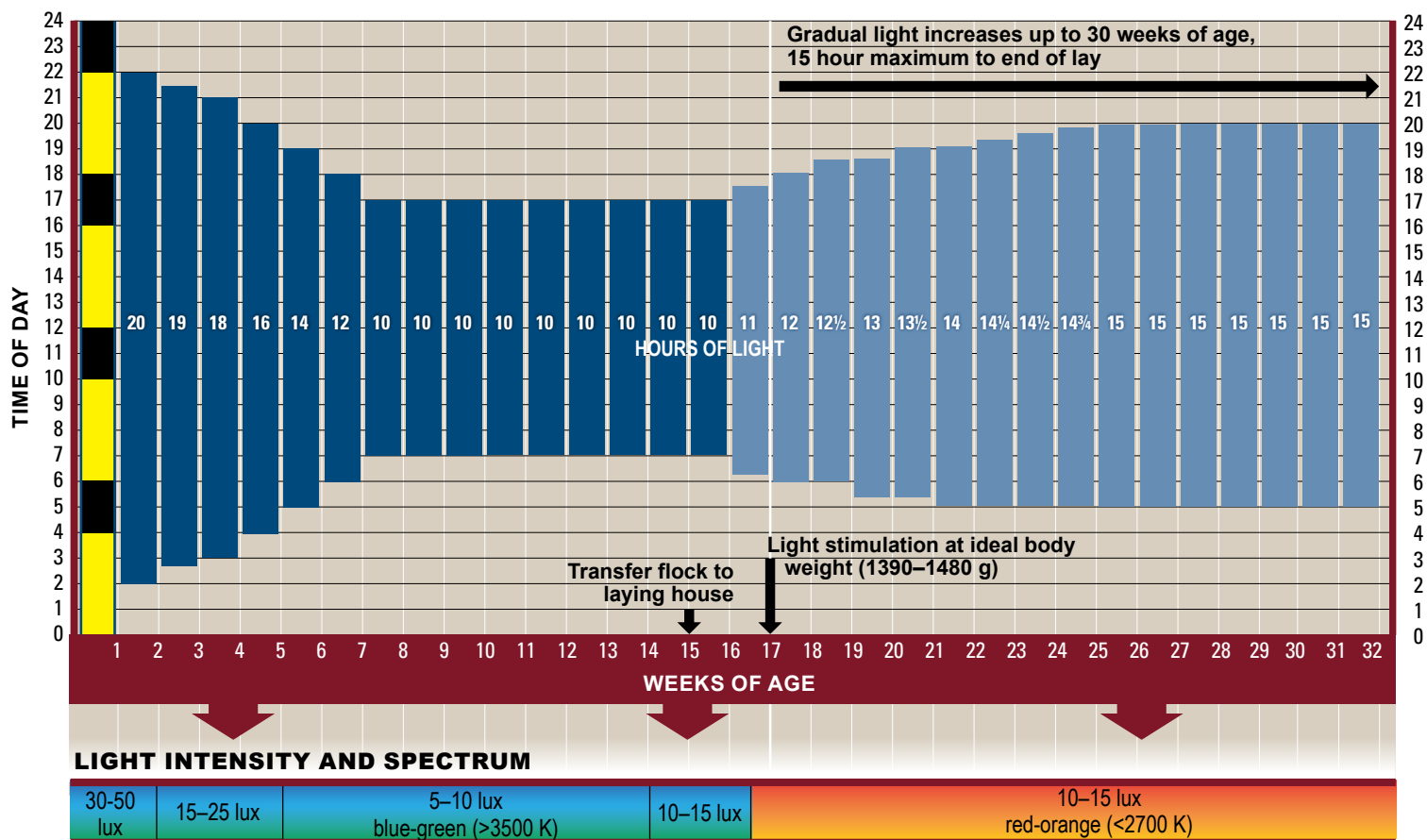
Frequently formulate to changing feed consumption during transition period until feed consumption is consistent.



Pre-Peak

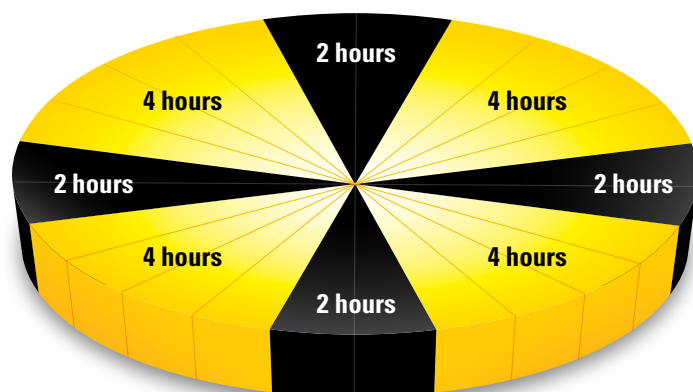
- Pre-Peak diets are intended for flocks with low feed intake and are fed for a limited period from first egg to the beginning of peak production. The nutrient specification of the Pre-Peak diet should be dense enough to allow for lower feed intake and also cater to the increased nutritional needs of the bird entering egg production. Continue to feed the Pre-Peak until feed intake has developed sufficiently to allow transition to the Peak diet.
- If utilized until no more than 50–70% HD, a Pre-Peak diet with reduced energy concentration can be beneficial to stimulate feed intake. Pre-Peaking diets are useful in situations where local conditions may result in reduced feed intake, such as hot climates where feed intake may be depressed.
- Increasing the vitamins and trace mineral inclusion to 30% can be useful to cope with the lower feed intake during the Pre-Peak phase.

Light Program for Light-Controlled Housing

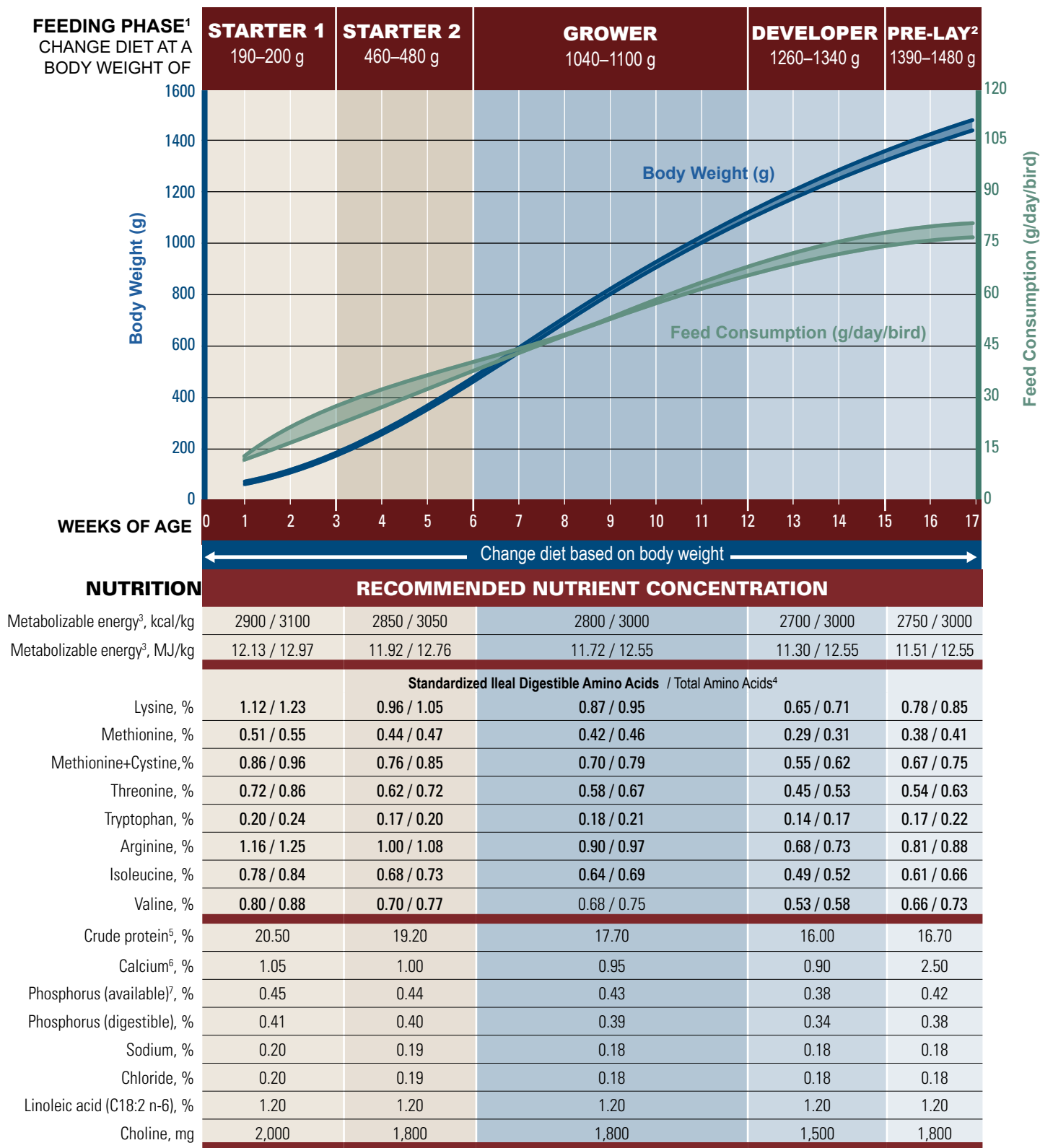


Intermittent Lighting Program for Chicks

- Preferred lighting technique.
- Use from 0–7 days (can be used up to 14 days of age).
- Intermittent dark periods provide rest periods for chicks.
- Synchronises chicks' activities and feedings.
- Establishes more natural behaviour of rest and activity.
- May improve 7-day livability and pullet body weight.
- Some dark periods may be shortened or removed to accommodate work schedules.



Rearing Period Nutritional Recommendations



¹ Body weights are approximate. Ages shown are a guide only. Please note that at time of transfer, there will be some loss in body weight (normally 10–12%) due to reduced water intake.

² Do not feed Pre-Lay Diet earlier than 15 weeks of age. Do not feed Pre-Lay later than first egg as it contains insufficient calcium to support egg production.

³ Recommended energy range is based on raw material energy values shown in feed ingredient table at back of this guide. It is important that target concentrations of dietary energy are adjusted according to energy system applied to raw material matrix.

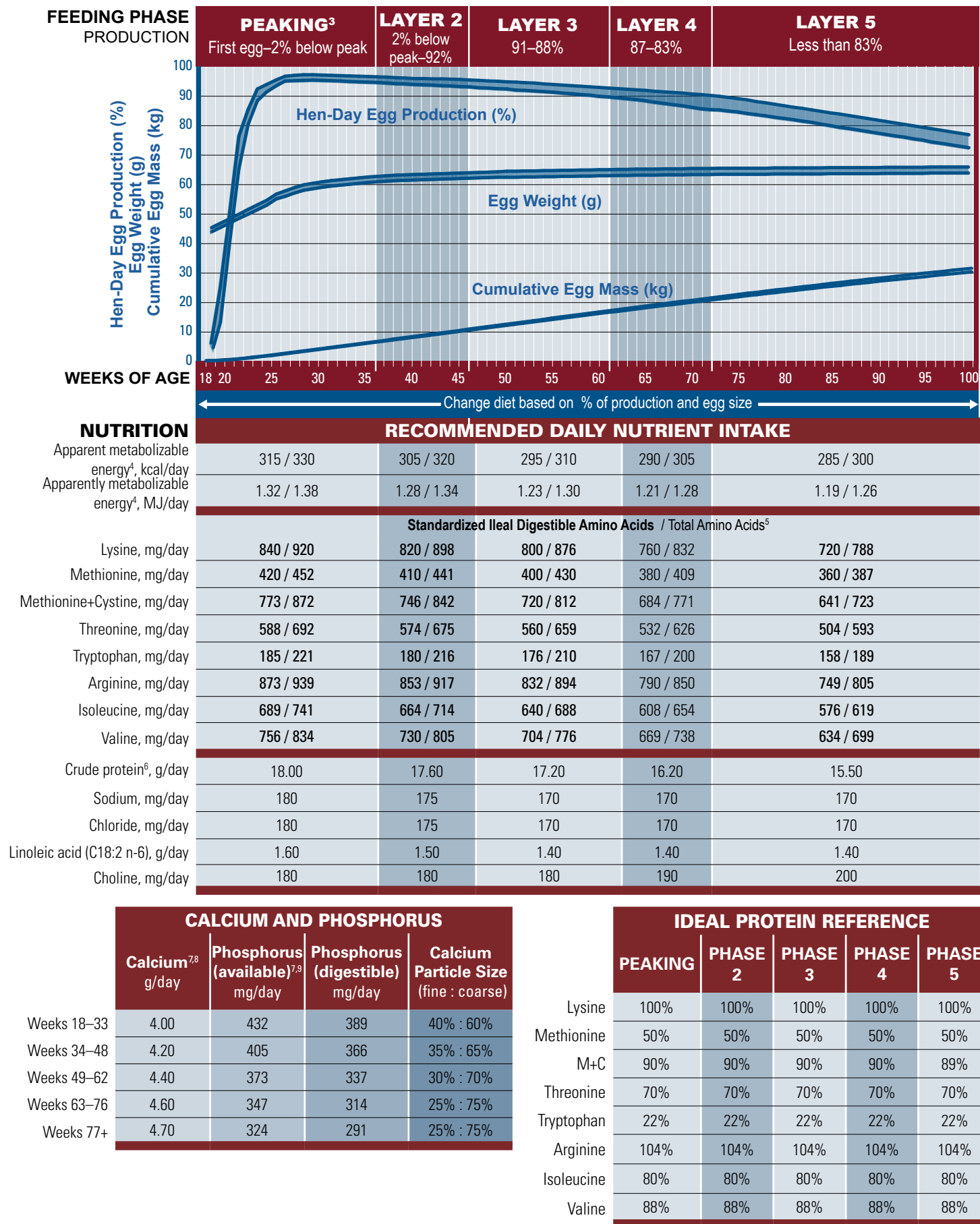
⁴ Recommendation for Total Amino Acids is only appropriate to corn and soybean meal diet. Where diets utilise other ingredients, recommendations for Standardised Ileal Digestible Amino Acids must be followed.

⁵ Diets should always be formulated to provide required intake of amino acid. Concentration of crude protein in diet will vary with raw material used. Crude protein value provided is an estimated typical value only.

⁶ Calcium should be supplied as fine calcium carbonate (mean particle size less than 2 mm). Coarse limestone (2–4 mm) can be introduced in Pre-Lay Diet at up to 50% of total limestone.

⁷ Where other phosphorus systems are used, diets should contain recommended minimum level of available phosphorus.

Production Period Nutritional Recommendations^{1,2}



Production Period Dietary Nutrient Concentrations^{1,2}

FEEDING PHASE PRODUCTION NUTRITION	PEAKING ³ First egg until production drops 2% below peak					LAYER 2 2% below peak to 92%					LAYER 3 91–88%					LAYER 4 87–83%					LAYER 5 Less than 83%								
	RECOMMENDED CONCENTRATION																												
	Apparent metabolizable energy ⁴ , kcal/day					315 / 330					305 / 320					295 / 310					290 / 305					285 / 300			
Apparent metabolizable energy ⁴ , MJ/day					1.32 / 1.38					1.28 / 1.34					1.23 / 1.30					1.21 / 1.28					1.19 / 1.26				
FEED CONSUMPTION (*Typical Feed Consumption)																													
g/day per bird					90	95	100	105	110	100	105	110	115	120	100	105	110	115	120	100	105	110	115	120	100	105	110	115	120
Standardized Ileal Digestible Amino Acids																													
Lysine, %					0.93	0.88	0.84	0.80	0.76	0.82	0.78	0.75	0.71	0.68	0.80	0.76	0.73	0.70	0.67	0.76	0.72	0.69	0.66	0.63	0.72	0.69	0.65	0.63	0.60
Methionine, %					0.47	0.44	0.42	0.40	0.38	0.41	0.39	0.37	0.36	0.34	0.40	0.38	0.36	0.35	0.33	0.38	0.36	0.35	0.33	0.32	0.36	0.34	0.33	0.31	0.30
Methionine+Cystine, %					0.86	0.81	0.77	0.74	0.70	0.75	0.71	0.68	0.65	0.62	0.72	0.69	0.65	0.63	0.60	0.68	0.65	0.62	0.59	0.57	0.64	0.61	0.58	0.56	0.53
Threonine, %					0.65	0.62	0.59	0.56	0.53	0.57	0.55	0.52	0.50	0.48	0.56	0.53	0.51	0.49	0.47	0.53	0.51	0.48	0.46	0.44	0.50	0.48	0.46	0.44	0.42
Tryptophan, %					0.21	0.19	0.19	0.18	0.17	0.18	0.17	0.16	0.16	0.15	0.18	0.17	0.16	0.15	0.15	0.17	0.16	0.15	0.15	0.14	0.16	0.15	0.14	0.14	0.13
Arginine, %					0.97	0.92	0.87	0.83	0.79	0.85	0.81	0.78	0.74	0.71	0.83	0.79	0.76	0.72	0.69	0.79	0.75	0.72	0.69	0.66	0.75	0.71	0.68	0.65	0.62
Isoleucine, %					0.77	0.73	0.69	0.66	0.63	0.66	0.63	0.60	0.58	0.55	0.64	0.61	0.58	0.56	0.53	0.61	0.58	0.55	0.53	0.51	0.58	0.55	0.52	0.50	0.48
Valine, %					0.84	0.80	0.76	0.72	0.69	0.73	0.70	0.66	0.63	0.61	0.70	0.67	0.64	0.61	0.59	0.67	0.64	0.61	0.58	0.56	0.63	0.60	0.58	0.55	0.53
Total Amino Acids ⁵																													
Lysine, %					1.02	0.97	0.92	0.88	0.84	0.90	0.86	0.82	0.78	0.75	0.88	0.83	0.80	0.76	0.73	0.83	0.79	0.76	0.72	0.69	0.79	0.75	0.72	0.69	0.66
Methionine, %					0.50	0.48	0.45	0.43	0.41	0.44	0.42	0.40	0.38	0.37	0.43	0.41	0.39	0.37	0.36	0.41	0.39	0.37	0.36	0.34	0.39	0.37	0.35	0.34	0.32
Methionine+Cystine, %					0.97	0.92	0.87	0.83	0.79	0.84	0.80	0.77	0.73	0.70	0.81	0.77	0.74	0.71	0.68	0.77	0.73	0.70	0.67	0.64	0.72	0.69	0.66	0.63	0.60
Threonine, %					0.77	0.73	0.69	0.66	0.63	0.68	0.64	0.61	0.59	0.56	0.66	0.63	0.60	0.57	0.55	0.63	0.60	0.57	0.54	0.52	0.59	0.56	0.54	0.52	0.49
Tryptophan, %					0.25	0.23	0.22	0.21	0.20	0.22	0.21	0.20	0.19	0.18	0.21	0.20	0.19	0.18	0.18	0.20	0.19	0.18	0.17	0.17	0.19	0.18	0.17	0.16	0.16
Arginine, %					1.04	0.99	0.94	0.89	0.85	0.92	0.87	0.83	0.80	0.76	0.89	0.85	0.81	0.78	0.75	0.85	0.81	0.77	0.74	0.71	0.81	0.77	0.73	0.70	0.67
Isoleucine, %					0.82	0.78	0.74	0.71	0.67	0.71	0.68	0.65	0.62	0.60	0.69	0.66	0.63	0.60	0.57	0.65	0.62	0.59	0.57	0.55	0.62	0.59	0.56	0.54	0.52
Valine, %					0.93	0.88	0.83	0.79	0.76	0.81	0.77	0.73	0.70	0.67	0.78	0.74	0.71	0.67	0.65	0.74	0.70	0.67	0.64	0.62	0.70	0.67	0.64	0.61	0.58
Crude protein ⁶ , %					20.00	18.95	18.00	17.14	16.36	17.60	16.76	16.00	15.30	14.67	17.20	16.38	15.64	14.96	14.33	16.20	15.43	14.73	14.09	13.50	15.50	14.76	14.09	13.48	12.92
Sodium, %					0.20	0.19	0.18	0.17	0.16	0.18	0.17	0.16	0.15	0.15	0.17	0.16	0.15	0.15	0.14	0.17	0.16	0.15	0.15	0.14	0.17	0.16	0.15	0.15	0.14
Chloride, %					0.20	0.19	0.18	0.17	0.16	0.18	0.17	0.16	0.15	0.15	0.17	0.16	0.15	0.15	0.14	0.17	0.16	0.15	0.15	0.14	0.17	0.16	0.15	0.15	0.14
Linoleic acid (C18:2 n-6), %					1.78	1.68	1.60	1.52	1.45	1.50	1.43	1.36	1.30	1.25	1.40	1.33	1.27	1.22	1.17	1.40	1.33	1.27	1.22	1.17	1.40	1.33	1.27	1.22	1.17
Choline, mg/kg					2000	1895	1800	1714	1636	1800	1714	1636	1565	1500	1800	1714	1636	1565	1500	1900	1810	1727	1652	1583	2000	1905	1818	1739	1667

CALCIUM AND PHOSPHORUS CHANGES BASED ON FEED INTAKE

	Weeks 18–33							Weeks 34–48					Weeks 49–62					Weeks 63–76					Weeks 77+				
	90	95	100	105	110	115	120	100	105	110	115	120	100	105	110	115	120	100	105	110	115	120	100	105	110	115	120
Feed Consumption, g/day per bird	90	95	100	105	110	115	120	100	105	110	115	120	100	105	110	115	120	100	105	110	115	120	100	105	110	115	120
Calcium ^{7,8} , %	4.44	4.21	4.00	3.81	3.64	3.48	3.33	4.20	4.00	3.82	3.65	3.50	4.40	4.19	4.00	3.83	3.67	4.60	4.38	4.18	4.00	3.83	4.70	4.48	4.27	4.09	3.92
Phosphorus (available) ^{7,9} , %	0.48	0.46	0.43	0.41	0.39	0.38	0.36	0.41	0.39	0.37	0.35	0.34	0.37	0.36	0.34	0.32	0.31	0.35	0.33	0.32	0.30	0.29	0.32	0.31	0.29	0.28	0.27
Phosphorus (digestible), %	0.43	0.41	0.39	0.37	0.35	0.34	0.32	0.37	0.35	0.33	0.32	0.31	0.34	0.32	0.31	0.29	0.28	0.31	0.30	0.29	0.27	0.26	0.29	0.28	0.26	0.25	0.24

¹ All nutrient requirements are based on the [Feed Ingredient Tables](#).

² Crude protein, methionine+cystine, fat, linoleic acid, and / or energy may be changed to optimize egg size.

³ Peaking nutrient levels are calculated for birds at peak egg production. Prior to achieving peak egg production, the nutrient requirements will be lower.

⁴ A good approximation of the influence of temperature on energy needs is that for each 0.5°C change higher or lower than 22°C, subtract or add about 2 kcal /bird /day, respectively.

⁵ Recommendation for Total Amino Acids is only appropriate to corn and soybean meal diet. Where diets utilize other ingredients, recommendations for Standardized Ileal Digestible Amino Acids must be followed.

⁶ Diets should always be formulated to provide required intake of amino acid. Concentration of crude protein in diet will vary with raw material used. Crude protein value provided is an estimated typical value only.

⁷ Calcium and available phosphorus requirements are determined by flock age. When production remains higher and diets are fed for longer than ages shown, it is recommended to increase to calcium and phosphorus concentrations of next feeding phase.

⁸ Calcium carbonate particle size recommendation varies throughout lay. Refer to [Calcium Particle Size](#). Dietary calcium levels and fine to coarse ratio may need to be adjusted based on limestone solubility.

⁹ Where other phosphorus systems are used, diets should contain recommended minimum level of available phosphorus.

Vitamins and Trace Minerals

ITEM ^{1,2,3,4}	IN 1000 KG COMPLETE DIET	
	Rearing Period	Production Period
Vitamin A, IU	10,000,000	8,000,000
Vitamin D ₃ ⁵ , IU	3,300,000	3,300,000
Vitamin E, g	30.00	25.00
Vitamin K (menadione), g	3.50	3.00
Thiamin (B ₁), g	2.20	2.50
Riboflavin (B ₂), g	6.60	5.50
Niacin (B ₃) ⁶ , g	40.00	30.00
Pantothenic acid (B ₅), g	10.00	10.00
Pyridoxine (B ₆), g	4.50	5.00
Biotin (B ₇), mg	100.00	75.00
Folic acid (B ₉), g	1.00	0.90
Cobalamine (B ₁₂), mg	23.00	23.00
Manganese ⁷ , g	100.00	100.00
Zinc ⁷ , g	85.00	80.00
Iron ⁷ , g	30.00	40.00
Copper ⁷ , g	15.00	8.00
Iodine, g	1.50	1.20
Selenium ⁷ , g	0.25	0.25

¹ Minimum recommendations for rearing and laying periods. Local regulations may limit dietary content of individual vitamins or minerals. Levels of 150-200 mg/kg of Vitamin C can be beneficial during periods of stress.

² Store premixes according to supplier's recommendations and observe 'use by' dates to ensure vitamin activity is maintained. Inclusion of antioxidant may improve premix stability.

³ Vitamin and mineral recommendations vary according to activity.

⁴ Where heat treatment is applied to diet, higher levels of vitamins may be required. Consult with vitamin supplier regarding stability through individual production processes.

⁵ A proportion of Vitamin D₃ can be supplemented as 25-hydroxy D₃ according to supplier's recommendations and applicable limits.

⁶ Higher levels of Niacin are recommended in non-cage systems.

⁷ Greater bioavailability and productivity may be possible with use of chelated mineral sources.

⁸ Supplementing with up to 500 ppm of magnesium may be beneficial to support eggshell quality, particularly in aged hens or during periods of increased metabolic demand.

Drinking Water Quality for Poultry

ITEM	MAXIMUM CONCENTRATION (ppm or mg/L)*	
Nitrate NO_3^- ¹	25	Older birds will tolerate higher levels up to 20 ppm. Stressed or disease challenged birds may be more sensitive to effects of Nitrate.
Nitrate Nitrogen ($\text{NO}_3\text{-N}$) ¹	6	
Nitrite NO_2^- ¹	4	Nitrite is considerably more toxic than Nitrate, especially for young birds, where 1 ppm Nitrite may be considered toxic.
Nitrite Nitrogen ($\text{NO}_2\text{-N}$) ¹	1	
Total dissolved solids ²	1000	Levels up to 3000 ppm may not affect performance but could increase manure moisture.
Chloride (Cl^-) ¹	250	Levels as low as 14 mg may be problematic if sodium is higher than 50 ppm.
Sulphate (SO_4^{2-}) ¹	250	Higher levels may be laxative.
Iron (Fe) ¹	<0.3	Higher levels result in bad odour and taste.
Magnesium (Mg) ¹	125	Higher levels may be laxative. Levels above 50 ppm may be problematic if sulphate levels are high.
Potassium (K) ²	20	Higher levels may be acceptable depending on sodium level, alkalinity, and pH.
Sodium (Na) ^{1,2}	50	Higher concentration is acceptable but concentrations above 50 ppm should be avoided if high levels of chloride, sulphate, or potassium exist.
Manganese (Mn) ³	0.05	Higher levels may be laxative.
Arsenic (As) ²	0.5	
Fluoride (F^-) ²	2	
Aluminium (Al) ²	5	
Boron (B) ²	5	
Cadmium (Cd) ²	0.02	
Cobalt (Co) ²	1	
Copper (Cu) ¹	0.6	Higher levels result in bitter taste.
Lead (Pb) ¹	0.02	Higher levels are toxic.
Mercury (Hg) ²	0.003	Higher levels are toxic.
Zinc (Zn) ¹	1.5	Higher levels are toxic.
pH ¹	5–7	Birds may adapt to lower pH. Below pH 5 may reduce water intake and corrode metal fittings. Above pH 8 may reduce intake and reduce effectiveness of water sanitation.
Total bacteria counts ³	1000 CFU/ml	This is likely to indicate dirty water.
Total Coliform bacteria ³	50 CFU/ml	
Faecal Coliform bacteria ³	0 CFU/ml	
Oxygen Reduction Potential (ORP) ³	650–750 mEq	The ORP range at which 2–4 ppm of free chlorine will effectively sanitise water at a favourable pH range of 5–7.

* Limits may be lower as interactions exist between magnesium and sulphate; and between sodium, potassium, chloride, and sulphate.

¹ Carter & Sneed, 1996. Drinking Water Quality for Poultry, Poultry Science and Technology Guide, North Carolina State University Poultry Extension Service. Guide no. 42

² Marx and Jaikaran, 2007. Water Analysis Interpretation. Agri-Facts, Alberta Ag-Info Centre. Refer to <http://www.agric.gov.ab.ca/app84/rwqit> for online Water Analysis Tool

³ Watkins, 2008. Water: Identifying and Correcting Challenges. Avian Advice 10(3): 10–15 University of Arkansas Cooperative Extension Service, Fayetteville

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TECHNICAL UPDATES

Diseases

An Overview of Focal Duodenal Necrosis (FDN)
MG Control in Commercial Layers
Colibacillosis in Layers: An Overview
Fowl Pox in Layers
Avian Urolithiasis (Visceral Gout)
Infectious Bursal Disease (IBD, Gumboro)
Fatty Liver Hemorrhagic Syndrome
Infectious Laryngotracheitis (ILT)
Intestinal Dilation Syndrome (IDS)
Newcastle Disease
Mycoplasma Synoviae (MS)
Low Pathogenic Avian Influenza (LPAI)

Diagnostic Samples and Breeder Flock Monitoring

Salmonella, *Mycoplasma*, and Avian Influenza
Monitoring in Parent Breeder Flocks
Proper Collection and Handling of Diagnostic Samples

Management

Growing Management of Commercial Pullets
Understanding the Role of the Skeleton in Egg Production
The Science of Egg Quality
Understanding Poultry Lighting
Understanding Heat Stress in Layers
Infrared Beak Treatment
Feed Granulometry and the Importance of
Feed Particle Size in Layers
Impact of Tarp Colour on Poultry Lighting
SPIDES (Short Period Incubation During Egg Storage)
Fly Management: Surveillance and Control
Optimising Egg Size in Commercial Layers
Vaccination Recommendations
Egg Drop Syndrome (EDS)
Managing Fully Beaked Flocks
Thiamin Deficiency in Pullets
Understanding Nesting Behaviour

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