Lohmann Brown Classic
Management Guide
Colony Systems

March 2011

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LB Classic Colony

Introduction

To achieve optimal production results, it is essential to make full use of the **Lohmann Brown** layer's performance potential by providing good housing conditions and systematic management. The aim of this manual is to draw the attention of the practical stockman to the more important points which, if overlooked, may depress flock performance. This manual is not intended to provide definitive information on every aspect of stock management and cannot substitute the regular observation of the birds and assessment of the respective conditions. It does, however, offer a base for efficient management.

The data in this manual gives some indication of what can be achieved under good environmental and management conditions. The profile of performance can be altered, to meet market demands, by management techniques, and can be adversely affected by poor management, disease and many other factors. Figures should not be regarded as guarantees of production but as performance objectives.

In recent decades, advanced methods have greatly improved breeding quality. Lohmann's use of electronic data processing systems has enabled them to put the theory of selection systematically into practice, thus turning modern quantitative genetics into reality. Lohmann's breeding aims continue to be based on the most efficient production of first quality eggs through good egg numbers, optimum egg weight, good shell strength and colour and excellent feed conversion. In addition, this work produces a bird with a good temperament, easily managed and adaptable to all types of production systems.

The Specifications in this manual are for the United Kingdom and may differ from the version produced for English speaking countries worldwide.

Performance Objectives

Eggs per hen housed to 72 weeks		316.6
Average Egg Size to 72 weeks		63.2 grams
Egg Mass to 72 weeks		20.01 kg
Egg Mass to 76 weeks		21.41 kg
Feed Consumption	Day Old to 16 Weeks	5.84 kg
	17 to 72 Weeks	43.9 kg
	17 to 76 Weeks	47.0 kg
Average Feed Intake	Colony	110 - 117 g/b/d
Bodyweight at	16 Weeks	1380 grams
Liveability	Rearing	97 - 98%
	Laying Period	93 - 96%

Rearing Management

Rearing is an extremely important stage in the bird's life as its bodyweight development and disease status will strongly influence the laying performance of the flock. Rearing sites should be housed with birds of a single age and should operate on an all-in-all-out system. Sheds should be thoroughly washed and disinfected between flocks. They should be well maintained to ensure there is no light or water leakage into the shed and that wild birds and vermin are excluded.

Temperature within the shed must be accurately controlled, adequate feeding and drinking space must be provided, and birds should not be overstocked in the shed.

If these conditions are provided, along with good quality management, the opportunity for successful rearing and highly productive laying flocks is more easily achieved.

The following figures give rules-of-thumb for conditions required in the rearing shed, but these must be allied to careful observation of the birds and action to maintain an ideal environment.

Brooders	1 × 36,000 BTU brooder per 2500 chicks. Temperature at litter 35°C. House temperature 33-34°C at day 1, reducing gradually to 20-22°C by day 28-35.		
Whole house heating	House temperature 33-34°C at day 1, reducing gradually to 20-22°C by day 28-35.		
Stocking density	Litter Cages	17kg/m^2 250cm^2/kg	In accordance with the code of recommendations for the welfare of livestock.
Feeding space	0 to 4 weeks 5 weeks to depletion	4.0 cm/pullet 8.0 cm/pullet	
Drinking space	Bell drinkers Nipple drinkers	1.25 cm/pullet 10-13 pullets/nipple	
Ventilation	Minimum Maximum	1.5 m^3/hr/kg bodyweight 6.0 m^3/hr/kg bodyweight	Note: Removing ammonia may be the first limiting factor before this minimum level of ventilation is reached.

Bodyweight Profile

The bodyweight profile on page 5 shows the expected growth curve for the Lohmann Brown. Where the two lines diverge the lower line shows the expected bodyweight for litter rearing, whilst the upper line shows the maximum recommended weight for rearing in cages. In litter rearing, it would be expected that the birds would be ad-lib fed throughout the rearing period. In cages, if bodyweights seem likely to exceed the maximum recommended weight, a degree of feed control may be required. On litter or in cages, feed control must not be practised before 8 weeks of age or after the first light increase, as the birds are being brought into lay.

In order to ensure that the birds are progressing satisfactorily, it is essential to monitor the birds' bodyweight throughout the rearing period. The first weights should be taken at 3 weeks of age and the birds weighed weekly thereafter. A representative sample should be weighed on each occasion i.e. a minimum of 40 per pen.

	Grams	X = One Bird Weight						
	1020							
	1040	X						
	1060							
	1080	X						
	1100	X	X					
▲	1120							
	1140	X						
	1160	X	X	X				
	1180	X	X	X				
	1200	X	X					
	1220	X	X	X	X			
●	1240	X	X	X	X	X	X	X
	1260	X	X	X	X	X	X	
	1280	X	X	X				
	1300	X	X					
	1320	X	X					
	1340	X						
▼	1360							
	1380	X						
	1400	X						
	1420							

In addition to bodyweight, the degree of evenness within the flock (the variation in bodyweights around the average weight) is important. Birds in an uneven flock will mature at different times and the flock will show a low flat peak of production. Also birds which matured late will still have good egg laying potential at depletion. There is therefore a loss of eggs at both ends of the production cycle.

The calculation for evenness is shown below. The target for evenness at 16 weeks should be in the region of 80%.

To achieve an evenness of 80% means that 80% of the birds weighed must be within + or - 10% of the average weight.

Example at 14 weeks of age

In the example shown average weight = 1240grms
10% of average weight = 124grms

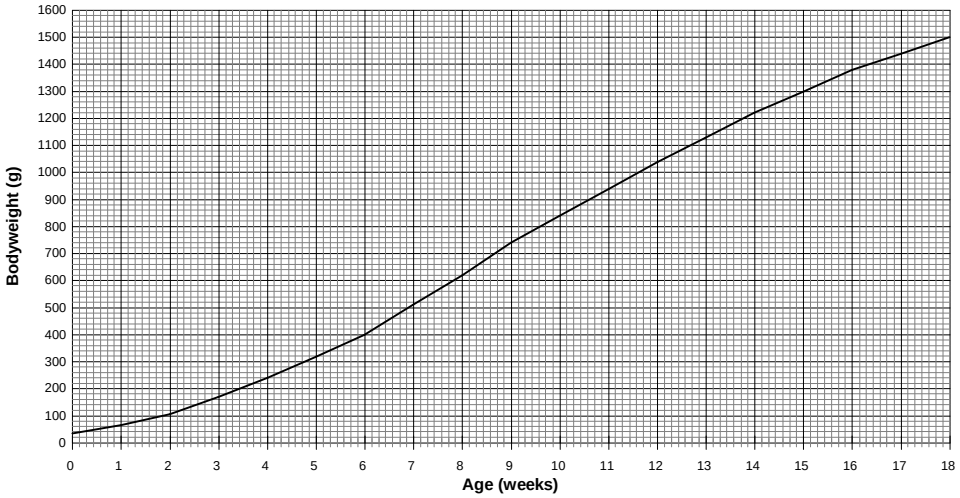
The range of weights used to calculate the evenness is:-
Lower weight = 1240 - 124 = 1116grms.

Upper weight = 1240 + 124 = 1364grms.

Number of birds weighed = 40
No of birds within + or - 10% of the average weight = 34

Evenness = 34÷40 = 85%

Lohmann Brown Bodyweight Targets



Age in Weeks	Target grms	Age in Weeks	Target grms
1	65	10	840
2	105	11	940
3	170	12	1040
4	240	13	1130
5	320	14	1220
6	400	15	1300
7	510	16	1380
8	620	17	1440
9	740	18	1500

Feed control must not be practised before 8 weeks of age or after the first light increase as the birds are being brought into lay.

Lighting in Rear

Lighting, in conjunction with bodyweight, is the main factor influencing the maturity of the bird.

At placement, in order to aid early development and evenness, chicks should be given a minimum of 4 hours darkness per day for the first 4 days e.g. lights on from 4am to midnight.

Standard maturity (75% production at 22 weeks) can be achieved by following the light programme in column A of the table on page 8. This will give production and egg size as shown in the performance objectives.

A more rapid onset of maturity can be achieved by using a series of larger increases in light period but still commencing with the first increase at 16 weeks, as shown in column B on page 8. Field results indicate that avoiding an early light increase e.g. at 14 or 15 weeks allows the bird to develop more, physically before onset of lay and results in better persistency of production and better shell quality in the later stages of lay.

Average egg size will be slightly lower than standard on this programme but egg size can be very effectively managed by nutrition. Lohmann GB can give recommendations for suitable diets in conjunction with your feed supplier.

Late maturity to achieve average egg size greater than standard can be controlled by implementing a slow step-down lighting programme in the early stages of rearing. Light programmes which step-down to an 8 hour day length by between 4 weeks and 8 weeks of age will delay maturity by an increasing amount, approximately 1 day for each week that the step-down programme is extended. Flocks on a slow step-down programme should receive their first light increase at 16 weeks.

Whichever light programme is followed, the single rule which must always be observed is that no decrease in day length must occur after the onset of lay. Light intensity in the laying house must always be an increase over that in the rearing house and should be in the range of 20 - 30 lux.

Lighting in Lay

In a controlled light environment, the light should be increased according to the schedule chosen from page 8. Initially, timing of lights on should be the same as that used on the rearing farm so this information is needed from the rearer. Day length must never be allowed to decrease during the laying period. In free range systems, account must be taken of the natural day length at the time of housing.

A bird of correct bodyweight will start to become sexually mature from approximately 18 weeks, regardless of whether any light increase is given or not. However, in this event, failure to increase day length will restrict the bird's ability to consume adequate nutrition during a period of rapid development. This will result in poor development and possible long term damage to the bird's productive potential as she will use her body resources to substitute the lack of nutrition.

No attempt should be made to delay maturity by delaying light increases after 18 weeks. Delayed maturity should be achieved by the use of a slow step down light programme in rearing as described previously in this manual.

Lighting Programmes

Age in Weeks	Light in hours				Light Intensity
	A	B	C	D	A Lux
Day 1 - 2	20.0	20.0	20.0	20.0	20-40
Day 3 - 6 Reducing to:	16.0	16.0	16.0	16.0	20-30
Day 7 - 14 Reducing to:	14.0	14.0	14.0	14.0	10-20
2 - 3 wks Reducing to:	10.0	10.0	13.0	8.0	5.10
4	10.0	10.0	12.0	8.0	5.10
5	10.0	10.0	11.0	8.0	5.10
6	10.0	10.0	10.0	8.0	5.10
7	10.0	10.0	10.0	8.0	5.10
8	10.0	10.0	10.0	8.0	5.10
9	10.0	10.0	10.0	8.0	5.10
10	10.0	10.0	10.0	8.0	5.10
11	10.0	10.0	10.0	8.0	5.10
12	10.0	10.0	10.0	8.0	5.10
13	10.0	10.0	10.0	8.0	5.10
14	10.0	10.0	10.0	8.0	5.10
15	10.0	10.0	10.0	8.0	5.10
16	11.0	12.0	11.0	10.0	5-10
17	12.0	14.0	12.0	12.0	20-30
18	13.0	15.0	13.0	14.0	20-30
19	14.0	15.0	14.0	15.0	20-30
20	15.0	15.0	15.0	15.0	20-30
21	15.0	15.0	15.0	15.0	20-30

A = Standard Maturity B = Rapid Maturity C = Delayed Maturity

Use the above programmes in conjunction with page 6.

Step down to a 10 hour day length is shown to reflect current industry practice. If standard bodyweight and evenness can be achieved using an 8 hour day length, this will not be detrimental to the birds. It is recommended that intensive rearing should follow programme D.

Housing - Laying Period

The Lohmann Brown is an early maturing hybrid and should be transferred to the laying house early enough to avoid stressing the birds as they come into lay. The timing of this will depend on the light stimulation programme used. For birds on the standard maturity light programme, housing should be at 16 weeks. On an earlier maturity programme transfer to the laying house should coincide with the first light increase.

Pullets can lose approximately 10% of their bodyweight at the time of transfer, principally through dehydration. It is essential to ensure that birds start drinking soon after being housed. Cages should be checked to ensure that at least one bird in the cage is drinking. The others will follow. On litter based systems, the stockman should be aware of any birds starting to develop pale combs and losing weight and ensure they have access to water.

Good quality feed, in terms of structure and raw material content, should be available ad-lib throughout the laying period. In the period between housing and peak production, it is important to match the increasing feed intake of the bird and ensure feed is freely available to avoid birds being faced with an empty trough.

Such a shortage of feed could lead to nutritional deficiency and result in stress on the bird at a critical period in the production cycle.
Nutritional requirements for the Lohmann Brown are shown in the table on pages11,13, and 14.

A shed temperature of 21°C is recommended. Temperatures below this will result in increased feed consumption at a rate of 1.5% increase in consumption per 1°C drop in temperature below 21°C. Temperatures above 25°C will have an increasingly adverse effect on egg weight. However, air quality within the shed is also important in avoiding respiratory problems with the birds. On some occasions, depending on environmental conditions, it may be necessary to sacrifice shed temperature in order to achieve sufficient air flow to maintain good air quality for the stock

Regular inspection of the stock is always essential and particularly in the period after housing to ensure that all birds make the transition from rearing farm to laying farm successfully without any undue stress that will affect their production potential.

Water consumption for adult hens at 21◦C should be 210 litres per 1000 birds. It is important that this level is achieved by first eggs.

Bodyweight

Bodyweights should be monitored weekly after housing on the laying site to ensure that the flock is progressing towards production satisfactorily. Failure to achieve target bodyweights should be addressed promptly by altering management.

A table of the bodyweights for Lohmann Brown from point of lay to end of lay is shown below.

Laying Period

Age In Weeks	Target Weight (grms)	Age In Weeks	Target Weight (grms)
16	1380	40	1950
17	1440	42	1950
18	1500	44	1950
19	1600	46	1950
20	1680	48	1950
21	1730	50	1950
22	1760	52	1950
23	1780	54	1950
24	1800	56	1940
25	1810	58	1940
26	1820	60	1930
27	1830	62	1920
28	1840	64	1920
29	1850	66	1910
30	1860	68	1910
32	1880	70	1900
34	1900	72	1900
36	1920	74	1890
38	1940	76	1890

Nutrition

D/O to POL

A good plane of nutrition will be required to achieve the target bodyweights and the diets recommended are described in this section.

Feed particle size and gut development
Feed particle size directly influences the gizzard and gut development. Crude particles in the feed stimulate gizzard activity and its volume necessary for efficient digestion. A recommended structure profile which covers the requirements of the bird and allows optimal feed flow is given below.

Use of flint grit from 3 weeks of age is also recommended to aid gizzard development

For birds in rear a 3 stage feeding programme is adequate consisting of chick starter plus, chick starter and grower.

Chick starter plus is fed to approximately 3 weeks or when the birds have achieved a minimum bodyweight of 170 grammes. Starter is then fed until birds are 8 weeks or when a minimum body weight of 620 g is achieved. Grower is fed until transfer to the laying site, which should be at 16 weeks of age.

For birds following the Early Maturity programme, using early light stimulation, it is even more important that the target bodyweight at 8 weeks and 14 weeks are achieved. If necessary starter plus and starter diet may have to be used for longer periods.

Recommended Particle - Size Distribution for Chick Starter, Grower and Layer feed (Mash)

Sieve size (mm)	Passing Part %	Sieve size interval (mm)	Part of interval %
0.5 mm	19	0 - 0.5 mm	19
1.0 mm	40	0.51 - 1.0 mm	21
1.5 mm	75	1.01 - 1.5 mm	35
2.0mm	90	1.51 - 2.0 mm	15
2.5mm	100	> 2.0 mm	10*
			100

* Individual Particles Not Bigger Than

- 3 mm in chick superstarter/starter diets
- 5 mm in grower and layer diets.

Nutrient levels for these rations are shown in the table on page 15.

Birds on all systems must be fed ad-lib up to 8 weeks as this is a vital period of body frame and immune system development. It should be noted that the metabolism of the bird will change around 8 weeks and the bird's main requirement will then be for energy rather than protein.

A table of expected feed consumption and water intake is shown below.

Feed and Water Consumption

Age in Weeks	Feed Consumption		Water Consumption	Age in Weeks	Feed Consumption		Water Consumption
	g/day	Cum. Grms	litres/1000 birds		g/day	Cum. Grms	litres/1000 birds
1	12	84	10	10	65	2751	105
2	17	203	22	11	68	3227	114
3	22	357	33	12	70	3717	124
4	29	560	44	13	72	4221	132
5	36	812	55	14	75	4746	140
6	44	1120	65	15	77	5285	148
7	51	1477	75	16	79	5838	156
8	56	1869	85	17	81	6405	165
9	61	2296	95	18	84	6993	174

Recommendations for Nutrient Levels During Rear and Early Lay

		Starter Plus	Starter	Grower	Start-Lay
		1-3 Wks	4-8 Wks	9-16 Wks	17-22Wks
Minimum	**MJ**	12.2	11.9	11.6	11.7
Crude Protein	**%**	20.2	18.6	14.5	18.0
Methionine	**%**	0.48	0.38	0.30	0.40
Meth/Cystine %		0.84	0.73	0.60	0.73
Dig. M/C	**%**	0.78	0.66	0.53	0.60
Lysine	**%**	1.15	1.00	0.70	0.80
Dig. Lysine	**%**	1.05	0.90	0.62	0.66
Tryptophan	**%**	0.24	0.23	0.17	0.18
Threonine	**%**	0.72	0.63	0.45	0.59
Calcium	**%**	1.05	1.00	0.95	3.50
Phosphorous total	**%**	0.75	0.75	0.75	0.55
Phosphorous avail.	**%**	0.47	0.45	0.40	0.40
Sodium	**%**	0.16	0.16	0.16	0.15
Chlorine	**%**	0.23	0.23	0.23	0.20
Linoleic Acid	**%**	1.25	1.20	1.00	1.80

Notes:

- If birds have been beak trimmed Starter plus can be crumbs, but should have a layer of meal covering the crumbs to allow birds easy access to feed.
- ME figures above are corrected for Nitrogen
- Total Phosphorus can be reduced in presence of added phytase

Nutrition

POL to 28 Weeks

During the early period of lay, feed consumption is developing. During this period it is important that excess calcium and fibre is curtailed as these will inhibit appetite. Therefore a tailor made Start Lay diet is recommended with the nutrient profile in the table on page 10. The calcium level should be fixed to 3.5 %; the fibre level should not exceed 4 %. The Start-Lay ration should be fed until a feed intake of 105g/b/d is established after which a layer ration 1 should be introduced.

Nutritional concepts after reaching 105g daily feed intake

From this stage on, a phase feeding system should be followed. The basis of feed formulation (% level of nutrients) is daily feed intake which can be influenced by energy level, house temperature, feather quality and feed structure.

By adjusting the feed levels, particularly crude protein, amino acids, calcium, phosphorous and linoleic acid to changing requirements, full use of nutrients can be achieved enabling high levels if production and persistent shell quality to be maintained.

Nutrition: Layer rations in relation to production output.

Layer phase 1 should be fed to flocks producing more than 57 grams daily egg mass. With standard production, changing to Layer Phase 2 is recommended to be by 50 weeks in order to adjust calcium and phosphorous levels in the birds diet to support shell stability in the later stage of lay. Layer Phase 3 should be introduced by 60 weeks for the same reason.

It is essential to note that in order to achieve optimum performance from the Lohmann Brown, birds should continue to be fed a Layer 1 ration as long as the daily egg mass output is greater than 57g.

With the persistent production of Lohmann Brown, this may mean continuing to feed Layer 1 well beyond 50 weeks. This is essential to maintain the supply of nutrients to a bird which will produce 20Kg of total egg mass in her lifetime! Should this be the case producers should consult their feed supplier regarding adjustments to calcium and phosphorus levels for maintaining shell stability as previously described.

An example of how to calculate daily egg mass output is shown below. Alternatively, your Lohmann Technical Manager will be able to supply you with a simple computer based flock recording system which will automatically calculate the daily egg mass figure for you.

Note: Daily egg mass is calculated by multiplying egg weight by the hen week % production divided by 100

Example:
Egg Weight = 60.4g
% HW Production = 93.9%
Daily Egg Mass = 60.4 x 93.9/100 = 56.7g

The figures stated in the 3 following tables apply to feed containing an energy level of 11.7 MJ (2780 kcal) per kg of feed at a temperature of 21°C and good feather condition.

Metabolizable Energy (ME) figures given in this manual are corrected for nitrogen.

LAYER PHASE 1 (Daily egg mass of 57g+)

Recommended Nutrient Levels per kg of Feed at different Feed Intake Levels

Nutrient	Requirement	Feed Intake		
	g/hen/Day	110 g	117 g	135 g
Crude Protein	19.60	17.82 %	16.75 %	14.52 %
Methionine	0.44	0.40 %	0.38 %	0.33 %
Meth./Cyst.	0.80	0.73 %	0.68 %	0.59 %
Dig. M/C	0.66	0.60 %	0.56 %	0.49 %
Lysine	0.87	0.79 %	0.74 %	0.64%
Dig. Lysine	0.71	0.65 %	0.61 %	0.53 %
Valine	0.74	0.67%	0.63%	0.55%
Tryptophan	0.21	0.19 %	0.18 %	0.16 %
Threonine	0.64	0.58 %	0.55 %	0.47 %
Calcium	4.10	3.73 %	3.50 %	3.04 %
Phosphor, tot.	0.60 *	0.55 %	0.51 %	0.44 %
Phosphor, av.	0.42	0.38 %	0.36 %	0.31 %
Sodium	0.17	0.15 %	0.15 %	0.13 %
Chlorine	0.17	0.15 %	0.15 %	0.13 %
Linoleic Acid	2.00	1.82 %	1.71 %	1.48 %

* lower levels acceptable in presence of added phytase

LAYER PHASE 2 (by approx 50 weeks)

Recommended Nutrient Levels per kg of Feed at different Feed Intake Levels

Nutrient	Requirement	Feed Intake		
	g/hen/Day	110 g	117 g	135 g
Crude Protein	18.40	16.73 %	15.73 %	13.63 %
Methionine	0.38	0.35 %	0.32 %	0.28 %
Meth./Cyst.	0.71	0.65 %	0.61 %	0.53 %
Dig. M/C	0.59	0.54 %	0.50 %	0.44 %
Lysine	0.83	0.75 %	0.71 %	0.61 %
Dig. Lysine	0.68	0.62 %	0.58 %	0.50 %
Valine	0.71	0.65%	0.61%	0.53%
Tryptophan	0.20	0.18 %	0.17 %	0.15 %
Threonine	0.58	0.53 %	0.50 %	0.43 %
Calcium	4.50	4.09 %	3.85 %	3.33 %
Phosphor, tot.	0.54 *	0.49 %	0.46 %	0.40 %
Phosphor, av.	0.38	0.35 %	0.32 %	0.28 %
Sodium	0.17	0.15 %	0.15 %	0.13 %
Chlorine	0.17	0.15 %	0.15 %	0.13 %
Linoleic Acid	1.60	1.45 %	1.37 %	1.19 %

* lower levels acceptable in presence of added phytase

LAYER PHASE 3 (by approx 60 weeks)

Recommended Nutrient Levels per kg of Feed at different Feed Intake Levels

Nutrient	Requirement	Feed Intake		
	g/hen/Day	110 g	117 g	135 g
Crude Protein	17.80	16.18 %	15.21 %	13.19 %
Methionine	0.36	0.33 %	0.31 %	0.27 %
Meth./Cyst.	0.67	0.61 %	0.57 %	0.50 %
Dig. M/C	0.55	0.50 %	0.47 %	0.41 %
Lysine	0.78	0.71 %	0.67 %	0.58 %
Dig. Lysine	0.64	0.58 %	0.55 %	0.47 %
Valine	0.67	0.61%	0.57%	0.50%
Tryptophan	0.19	0.17 %	0.16 %	0.14 %
Threonine	0.55	0.50 %	0.47 %	0.41 %
Calcium	4.70	4.27 %	4.02 %	3.48 %
Phosphor, tot.	0.47 *	0.43 %	0.40 %	0.35 %
Phosphor, av.	0.33	0.30 %	0.28 %	0.24 %
Sodium	0.17	0.15 %	0.15 %	0.13 %
Chlorine	0.17	0.15 %	0.15 %	0.13 %
Linoleic Acid	1.20	1.09 %	1.03 %	0.89 %

* lower levels acceptable in presence of added phytase

Free Range Diets

Free Range diets should have a ME level of 11.8 MJ/kg and be formulated on feed intake based on the same requirements of other nutrients as for intensive flocks.

Once the birds have passed the Startlay phase, they are able to compensate their higher energy demands by increased feed consumption. Management systems, feather quality and diseases will affect energy demand.

Fine and coarse Limestone in Layer Diets

Up to about 30 weeks of age a bone growth continues. Therefore young hens require calcium both for bone growth and shell formation. Crude limestone (2-5 mm) has the advantage that it remains in the gizzard and is released over night, where the highest Calcium demand of a laying hen occurs. Due to these circumstances both sources of limestone should be incorporated in layer diets. The relation between fine and coarse limestone should be as shown in the following table.

Continuous Supply of Fine and Coarse Limestone Recommended Relation in Feed

Feed Type	Fine Limestone	Coarse Limestone (can be partly replaced by oyster shells)
Start-Lay	35%	65%
Layer Phase 1	30%	70%
Layer Phase 2	25%	75%
Layer Phase 3	15%	85%

Supplements

Supplements ensure the necessary supply of essential vitamins, trace elements and substances such as anti-oxidants or carotenoids for yolk pigmentation.

Suitable supplementation can compensate for varying contents of raw materials and safeguard the supply of all necessary micronutrients.

Recommended Supplements

Supplements per kg		Starter Feed	Grower Feed	Pre-/Start Layer Feed	Layer Feed
Vitamin A	**I.U.**	12000	8000	10000	10000
Vitamin D_3	**I.U.**	3000	2000	3000	3000
Vitamin E	**mg**	10 - 30*	10 - 30*	20 - 60*	10 - 30*
Vitamin K_3	**mg**	3**	3**	3**	3**
Vitamin B_1	**mg**	1	1	1	1
Vitamin B_2	**mg**	6	6	6	4
Vitamin B_6	**mg**	3	2	3	3
Vitamin B_{12}	**mcg**	25	20	25	25
Pantothenic Acid	**mg**	8	7	8	8
Nicotinic Acid	**mg**	30	30	30	30
Folic Acid	**mg**	1.0	0.5	1.0	0.5
Biotin	**mcg**	50	25	50	-
Choline Chloride	**mg**	100	100	100	50
Anti-oxidants	**mg**	100 - 150*	100 - 150*	100 - 150*	100 - 150*
Coccidiostat		as required	as required	-	-
Manganese	**mg**	100	100	100	100
Zinc	**mg**	60	60	60	80
Iron	**mg**	25	25	25	25
Copper	**mg**	5	5	5	5
Iodine	**mg**	0.5	0.5	0.5	0.5
Selenium	**mg**	0.2	0.2	0.2	0.2

* According to fat content
** Doubling with heat treated feed

Levels are based on UK (wheat/soya) diets.

Information on supplements are available from you local Lohmann GB Representative.

Performance Monitoring

Records

Good records constitute an essential aid to management. They are important to:-

1. Show if the flock is performing to expectation.
2. Indicate changes in bird behaviour, e.g. a drop in feed or water consumption, that may give early warning of a problem.
3. Give essential background information in the analysis of problems.
4. Give historical information to allow comparison of one flock with another.

Records needed in rearing are:-
Date housed.
Number housed.
Mortality by day.
Temperature - daily max. and min.
Water consumption - daily.
Feed consumption - daily.
Lighting programme.
Vaccination programme - including
Date of administration.
Batch numbers/expiry date.
Bodyweights - weekly from 2 weeks.
Details of all feed and materials deliveries .
Record of all visitors to the farm.

Records needed in production are those shown above (bodyweights taken every 5 weeks after 30 weeks) plus the following:-
Production % - daily.
Seconds % - daily.
Egg weight - daily.
Egg room temperature - daily.
Details of all egg collections from the farm.

Feed Sampling

In case of poor performance, it is often impossible to make reference to the particular feed being used because no sample is available, thus feed is commonly implicated by default. It is, therefore, good practice, in agreement with the feed supplier to establish a feed sampling procedure so that each delivery may be sampled and stored for a relevant period. A procedure involving taking a daily, dated feed sample from each feed bin is a practical way of monitoring feed deliveries.

Flock Health

Blood monitoring is extremely useful in giving a historical picture of flock health in the event of a production problem. Blood samples taken at 20, 25, 30, 40 and 50 weeks can be stored by your vet at minimal cost. If an investigation becomes necessary, these can be analysed as a batch to give a series of blood titre results through the life of the flock. The results can help to show whether the problem is due to development of disease or not.

Records of all blood sample results, post mortems, etc. for a flock should be carefully stored together. These can be used as an aid to develop the flock management and vaccination programme for subsequent flocks.

Performance Objectives
20 - 48 Weeks

Age Wks	Cum. Mort. %	Hen Wk Prod.%	Eggs /H.H Cum.	Av. Egg Wt. grm. Wk	Av. Egg Wt. grm. Cum.	Daily Egg Mass	Egg Mass Cum. kg.	Feed Intake g/b/d	Feed/H.H Cum. kg.	FCR
20	0.1	30.0	2.9	48.9	47.7	14.7	0.140	100.0	2.6	18.46
21	0.2	55.0	6.8	51.8	50.0	28.5	0.339	106.0	3.3	9.82
22	0.3	75.0	12.0	54.3	51.9	40.7	0.623	109.0	4.1	6.56
23	0.4	88.0	18.2	56.3	53.4	49.5	0.968	112.0	4.9	5.03
24	0.5	92.5	24.6	57.6	54.5	53.3	1.339	115.0	5.7	4.24
25	0.6	94.5	31.2	58.7	55.3	55.4	1.725	117.0	6.5	3.76
26	0.7	94.5	37.7	59.4	56.1	56.2	2.116	117.0	7.3	3.45
27	0.8	94.5	44.3	60.2	56.7	56.9	2.511	117.0	8.1	3.23
28	0.9	94.5	50.9	60.6	57.2	57.2	2.908	117.0	8.9	3.07
29	1.0	94.5	57.4	61.0	57.6	57.7	3.308	117.0	9.7	2.94
30	1.0	94.3	64.0	61.5	58.0	58.0	3.713	117.0	10.5	2.84
31	1.1	94.2	70.6	61.9	58.4	58.3	4.120	117.0	11.4	2.76
32	1.2	94.1	77.1	62.3	58.7	58.6	4.528	117.0	12.2	2.69
33	1.3	94.0	83.7	62.5	59.0	58.8	4.937	117.0	13.0	2.63
34	1.4	93.9	90.2	62.8	59.3	58.9	5.347	117.0	13.8	5.58
35	1.5	93.7	96.7	62.9	59.5	58.9	5.756	117.0	14.6	2.53
36	1.6	93.5	103.2	62.9	59.7	58.8	6.165	117.0	15.4	2.50
37	1.7	93.4	109.7	63.1	59.9	58.9	6.573	117.0	16.2	2.46
38	1.8	93.3	116.1	63.2	60.1	58.9	6.981	117.0	17.0	2.44
39	1.9	93.2	122.6	63.3	60.3	59.0	7.389	117.0	17.8	2.41
40	2.0	92.9	129.0	63.4	60.4	58.9	7.793	117.0	18.6	2.39
41	2.1	92.6	135.3	63.5	60.6	58.8	8.196	117.0	19.4	2.37
42	2.2	92.4	141.6	63.6	60.7	58.8	8.5.99	117.0	20.2	2.35
43	2.3	92.1	147.9	63.7	60.8	58.7	9.000	117.0	21.0	2.33
44	2.4	91.8	154.2	63.8	61.0	58.6	9.400	117.0	21.8	2.32
45	2.5	91.6	160.5	63.9	61.1	58.6	9.800	117.0	22.6	2.31
46	2.6	91.3	166.7	64.0	61.2	58.5	10.199	117.0	23.4	2.30
47	2.7	91.0	172.9	64.2	61.3	58.4	10.597	117.0	24.2	2.28
48	2.8	90.8	179.1	64.3	61.4	58.3	10.994	117.0	25.0	2.27

Performance Objectives
49 - 76 Weeks

Age Wks	Cum. Mort. %	Hen Wk Prod.%	Eggs /H.H Cum.	Av. Egg Wt. grm. Wk	Av. Egg Wt. grm. Cum.	Daily Egg Mass	Egg Mass Cum. kg.	Feed Intake g/b/d	Feed/H.H Cum. kg.	FCR
49	2.9	90.5	185.2	64.4	61.5	58.3	11.390	117.0	25.8	2.26
50	2.9	90.2	191.4	64.5	61.6	58.2	11.785	117.0	26.6	2.26
51	3.0	89.8	197.4	64.6	61.7	58.0	12.179	117.0	27.4	2.25
52	3.1	89.3	203.5	64.7	61.8	57.8	12.570	117.0	28.2	2.24
53	3.2	88.8	209.5	64.8	61.8	57.6	12.958	117.0	29.0	2.24
54	3.3	88.3	215.5	64.9	61.9	57.3	13.345	117.0	29.8	2.23
55	3.4	87.9	221.4	65.0	62.0	57.2	13.731	117.0	30.6	2.23
56	3.5	87.4	227.3	65.1	62.1	56.9	14.114	117.0	31.3	2.22
57	3.6	86.9	233.2	65.3	62.2	56.7	14.497	117.0	32.1	2.22
58	3.7	86.4	239.0	65.4	62.2	56.5	14.878	117.0	32.9	2.21
59	3.8	85.9	244.8	65.5	62.3	56.2	15.256	117.0	33.7	2.21
60	3.9	85.5	250.6	65.6	62.4	56.1	15.633	117.0	34.5	2.21
61	4.0	85.0	256.3	65.7	62.5	55.8	16.009	117.0	35.3	2.20
62	4.1	84.5	261.9	65.8	62.5	55.6	16.382	117.0	36.1	2.20
63	4.2	84.0	267.6	65.9	62.6	55.4	16.753	117.0	36.9	2.20
64	4.3	83.5	273.2	66.0	62.7	55.1	17.123	117.0	37.6	2.20
65	4.4	83.0	278.7	66.1	62.7	54.9	17.490	117.0	38.4	2.20
66	4.5	82.6	284.3	66.2	62.8	54.7	17.856	117.0	39.2	2.20
67	4.6	82.1	289.7	66.4	62.9	54.5	18.220	117.0	40.0	2.19
68	4.7	81.6	295.2	66.5	62.9	54.2	18.582	117.0	40.8	2.19
69	4.8	81.1	300.6	66.6	63.0	54.0	18.942	117.0	41.5	2.19
70	4.8	80.6	306.0	66.7	63.1	53.7	19.300	117.0	42.3	2.19
71	4.9	80.1	311.3	66.8	63.1	53.5	19.656	117.0	43.1	2.19
72	5.0	79.6	316.6	66.9	63.2	53.3	20.010	117.0	43.9	2.19
73	5.1	79.2	321.8	67.0	63.3	53.1	20.362	117.0	44.7	2.19
74	5.2	78.7	327.1	67.1	63.3	52.8	20.713	117.0	45.4	2.19
75	5.3	78.2	332.2	67.2	63.4	52.6	21.061	117.0	46.2	2.19
76	5.4	77.7	337.4	67.3	63.5	52.3	21.408	117.0	47.0	2.14

Lohmann GB Limited

Company Contacts:

Managing Director: **David Scott**
Tel: **07711 795723**
Fax: **01905 459461**
E-Mail: d.scott@lohmanngb.co.uk

Sales Administrator: **Julia Wright**
Tel: **01905 459469**
Fax: **01526 352022**
E-mail: j.wright@lohmanngb.co.uk

Regional Technical Manager
South East England **Alan Berry**
Tel: **07831 618186**
E-Mail: a.berry@lohmanngb.co.uk

Regional Technical Manager
South West England **Dave Welch**
Northern Ireland & ROI
Tel: **07850 361819**
E-Mail: d.welch@lohmanngb.co.uk

Regional Technical Manager
Midlands & North Wales **James Atrill**
Tel: **07850 944148**
E-Mail: j.atrill@lohmanngb.co.uk

Regional Technical Manager
Scotland & North England **Kenny Shaw**
Tel: **07710 083305**
E-Mail: k.shaw@lohmanngb.co.uk

Agent:
Scotland: **John Retson**
Tel: **07831 541703**
E-mail: jsrservices@tiscali.co.uk

Marketing Information **Carole Arnold**
Tel: **01526 832956**
E-Mail: c.arnold@lohmanngb.co.uk

Sales Office: Lohmann GB Limited
First Floor
Matthew Temple House
The Broadway
Woodhall Spa
Lincolnshire LN10 6ST
Tel: 01905 459469
Fax: 01526 352022

Head Office: Lohmann GB Limited
Suite 1B
Shire Business Park
Wainwright Road
Worcester
WR4 9FA
Tel: 01905 459460
Fax: 01905 459461

E-mail: sales@lohmanngb.co.uk
www.lohmanngb.co.uk

This manual and all the necessary record cards are available on CD from your Regional Technical Manager.

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