

LOHMANN LSL-LITE

Layers



MANAGEMENT GUIDE

CAGE HOUSING

North American Edition

BREEDING FOR SUCCESS ... TOGETHER



LOHMANN
BREEDERS

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INTRODUCTION

Why should you study this management guide?

Most people who are involved in commercial egg production, have seen management guides for different strains of layers before and may think “if you have seen one, you’ve seen them all”. Others take the contents more seriously and expect frequent updates to find specific data which apply to the current generation of layers and current management practices.

Newcomers in the business may need more detailed explanations than can be presented in this compact format.

We hope that each reader will find some useful information, to confirm proven management practices or to stimulate improvements. ■



TOP PERFORMANCE BY SYSTEMATIC SELECTION



LOHMANN – the right partner for progressive, successful poultry management.

In recent decades advanced methods have significantly improved breeding quality. Due to the development of powerful electronic data processing systems, it has become possible to put the theory of selection systematically into practice – thus turning modern quantitative genetics into reality.

From very early on, LOHMANN used these new techniques and can therefore offer an extensive range of experience and know-how. A highly qualified team of specialists guarantees prompt utilization of the latest research results. The market's changing demands can therefore be met quickly and effectively.

Moreover, nationally and internationally, LOHMANN is ranked as first class for questions on poultry health, which is one of the decisive factors for performance and profitability.

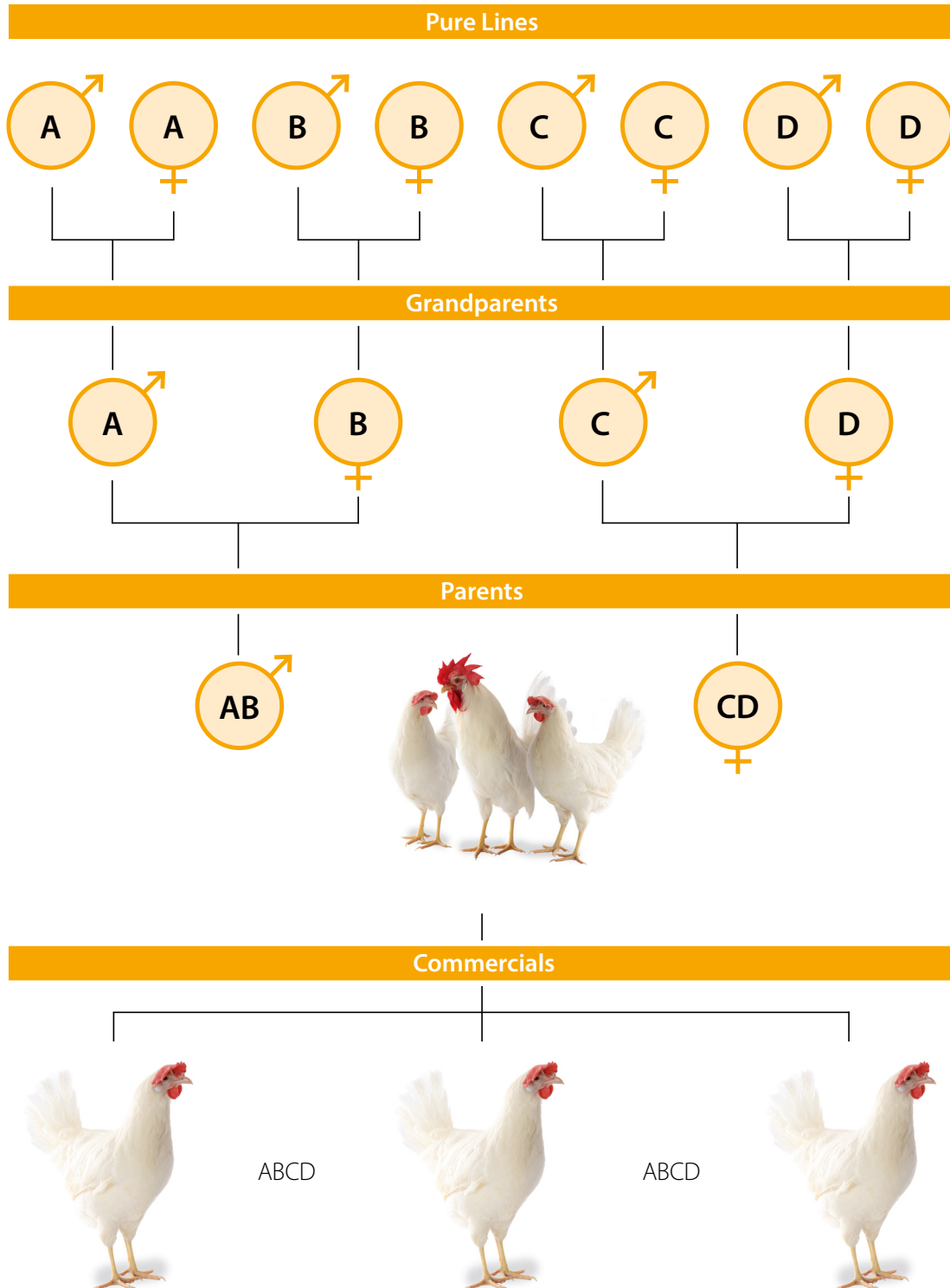
Intensive research from our veterinary experts, besides increasing resistance to diseases by genetic means and ensuring the strictest conditions of hygiene, is fundamental to the quality of LOHMANN products.

In addition, LOHMANN also provides expert advice on all questions of feed, nutrition and technical service.

Practice profits from this extensive expertise in all aspects of poultry management. With LOHMANN products, eggs are produced in top quality and at competitive costs.

Results of performance comparisons in the field and in independent institutes are proof of this success. LOHMANN products are often the winners and are always among the few at the top, worldwide.

BREEDING SCHEME



PERFORMANCE DATA

LOHMANN LSL-LITE Layer

Egg Production	Age at 50% production	140–145 days
	Peak production	95–97%
	Eggs per Hen Housed	
	in 72 weeks of age	333
	in 80 weeks of age	378
	in 100 weeks of age	478
	Eggs Mass per Hen Housed	
	in 72 weeks of age	20.24 kg (lbs)
	in 80 weeks of age	23.12 kg (lbs)
	in 100 weeks of age	29.49 kg (lbs)
Average Egg Weight	in 72 weeks of age	60.76 g (Oz./Doz.)
	in 80 weeks of age	61.08 g (Oz./Doz.)
	in 100 weeks of age	61.65 g (Oz./Doz.)
Egg Characteristics	Shell colour	attractive white
	Shell breaking strength	> 40 Newton
Feed Conversion Ratio	1.93 – 1.99 kg/kg egg mass or lbs./lbs. egg mass	
Body Weight	at 20 weeks	1,35 – 1,45 kg
	at the end of production	1,65 – 1,75 kg
Liveability	Rearing	98 – 99 %
	Laying period (72 weeks)	95 – 96 %
	Laying period (100 weeks)	91 – 92 %
Consistency of Dropping	Excellent dry	



HOUSING CHICKS

Cage Systems

- › Before bringing in the chicks, check if everything is in good working order.
- › Warm up the house in good time, i.e. up to 35 – 36 °C (95 – 97 °F) before the chicks are delivered. In summer start heating at least 24 hours and in winter at least 48 hours before the chicks arrive. When the right temperature has been achieved, supply minimum ventilation. This will avoid temperature differences within the house.
- › Maintain the recommended temperature of 35 – 36 °C (95 – 97 °F) during the first 48 – 72 hours.
- › Relative humidity should be at least 60%.
- › Adjust cage floors and feeding grids according to the manufacturer's instruction.
- › Place sheets of paper on the cage floor for the first days and distribute a bit of feed on this paper. The papers must be removed by day 7.
- › Reduce the water pressure of the nipples in order to enable the chicks to find water easily and trigger nipples/water cups to encourage birds to drink. Keep drinking water temperature between 20 – 25 °C (68 – 77 °F) by temporarily flushing the nipple drinker lines.
- › Unload all chick boxes and distribute them in the house. Remove all lids and place them on the top of the boxes.
- › Quickly place the chicks near feeders and drinkers. Distribute the chicks evenly among the cages starting at the far end of the house.
- › Follow the recommended Lighting Program (refer to page 22).
- › Measure the brooder temperature by placing the thermometer 8 cm (3 in) inside the outer edge of the brooder and 8 cm (3 in) above the litter.
- › Relative humidity should be at least 60%.
- › After arrival, place chicks under hover as soon as possible.
- › Reduce the water pressure of the nipples in order to enable the chicks to find water easily. Dip the beaks of a few chicks and trigger nipple or water cups to help them start drinking. When drinking water has been found by all chicks (this will take approx. 2 – 3 hours), they will start to eat. Keep drinking water temperature between 20 – 25 °C (68 – 77 °F) by temporarily flushing the nipple drinker lines or renewing the water in the chick founts.
- › Supply Chicks with additional feeding pans to ensure a better feed intake in the first few days.
- › Check the chicks frequently, even during the night to avoid any problems.
- › Chicks should be fully feathered before brooding equipment can be removed.
- › Follow the recommended Lighting Program (refer to page 22).

After a few hours, check whether the chicks have settled down well. The chicks' behavior is the best indicator of their well being:

- › If the chicks are evenly spread out and moving freely, temperature and ventilation are all right.
- › If the chicks are crowding together or avoiding certain areas within the house, temperature is too low or there is a draft.
- › If the chicks are laying on the floor with their wings spread out and gasping for air, temperature is too high.

At first signs that the chicks are not feeling well determine the reason, correct the situation and check more frequently.

Floor Systems

- › Before bringing in the chicks, check if everything is in good working order.
- › Warm up the house in good time, i.e. up to 35 – 36 °C (95 – 97 °F) before the chicks are delivered. In summer start heating at least 24 hours and in winter at least 48 hours before the chicks arrive. When the right temperature has been achieved, supply minimum ventilation. This will avoid temperature differences within the house. Maintain the recommended temperature of 35 – 36 °C (95 – 97 °F) during the first 48 – 72 hours.

ENVIRONMENT

Environmental conditions have an effect on the wellbeing and performance of the birds. Important environmental factors are temperature, humidity and level of toxic gases in the air. The optimal temperature depends on the age of the birds. The following table is a guide to the recommended temperature at bird level. As mentioned before, the birds behavior is the best indicator for correct temperature.

**Table 1: Desired Temperatures at Bird Level
Dependent on Age**

Age	Cage Rearing		Floor Rearing	
	°C	°F	°C	°F
Day 1–2 *	35	95	36	97
Day 3–4	33	91	34	93
Day 5–7	31	88	32	90
Week 2	28	82	29	84
Week 3	26	79	27	81
Week 4	22	72	24	75
From Week 5	18–20	64–68	18–20	64–68

* Body temperatures of 40–41 °C are the optimum for the chicks.

The relative humidity inside the house should be about 60–70 %. The air quality should meet the following minimum requirements:

Table 2: Minimum Air Quality Requirements

O ₂	over	20%
CO ₂	under	0.3%
CO	under	40 ppm
NH ₃	under	20 ppm
H ₂ S	under	5 ppm

Brooding Temperature

Always reduce temperature gradually, and avoid sudden changes. If the ventilation system is used to regulate temperature, take care that the necessary fresh air is supplied. The relative humidity inside the house should be 60 – 70 %.

Body Temperature of the Chicks

There are findings which confirm that the temperature of chicks is between 40.0 (104 °F) and 41.0 °C (105.8 °F) after the moment of full homeothermy. This information can be parallelly used with the behavior of the housed chicks to adjust house temperatures in an optimal way. Use modern ear thermometers, known from human medicine, as these are useful devices to measure the body temperature of day old chicks.



Make sure that you collect samples of chicks in different parts of the house and control the rectal temperature of the latter. Proceed in a way like you normally would do when weighing chicks/pullets and check for uniformity. Obtain samples from chicks distributed throughout the house in order to have reliable readings. Collect the information, calculate the average and adjust the house temperatures accordingly to achieve optimal chick temperatures.

If the actual barn temperature, humidity or uniformity of air distribution are significantly below the recommended levels, chick growth maybe adversely affected due to chilling.

VACCINATION

General Recommendations

Vaccination is an important way of preventing diseases. Different regional epidemic situations require suitably adapted vaccination programs. Therefore, please be guided, by the advice of your local veterinarian and poultry health service. Only healthy flocks should be vaccinated. Check the expiration date of the vaccine. The vaccine must not be used after this date. Keep records of all vaccinations and vaccine serial numbers.

Vaccination Methods

Individual Vaccinations such as injections and eye-drops are very effective and generally well tolerated but also very labor intensive.

Drinking Water Vaccinations are not labor intensive but must be carried out with the greatest care to be effective. The water used for preparing the vaccine solution must not contain any disinfectants. The amount of vaccine solution should be calculated for complete consumption within 2–4 hours. When vaccinating with live vaccines, you may add 0.267 ounces of skim milk powder per gallon of water (2 g/liter) or canned milk in order to protect the virus titer, if no water stabilisator is available.

Spray Vaccinations are not labor intensive and are highly effective, but may occasionally have side effects. For chicks up to the age of 3 weeks apply only coarse spray. Use distilled water for vaccination.

Special Recommendations

Marek Re-Vaccinations have proved to be successful after long transportation and in areas with high infection risk. Consult your veterinarian and the LOHMANN Technical Service Team for further information.

Mycoplasmosis Vaccinations are only advisable if the farm cannot be kept free of mycoplasmosis. Infections with virulent mycoplasma species during the production period lead to performance depression. The best performance is achieved by flocks which are kept free of mycoplasmosis and are not vaccinated.

Vaccination against Coccidiosis is the most reliable method in the floor rearing to develop immunity against this disease. Never use coccidiostats in the feed when pullets are vaccinated.

Applying Vitamins in the first two to three days after vaccination can help to reduce stress and prevent undesired reactions. To what extent depends on the specific situation on each farm.

VACCINATION

Table 3: Example of a Vaccination Program for LOHMANN LSL-LITE Layers

Disease	Occurrence		Application Methods	Remarks
	Worldwide	Locally		
Marek	●		SC – IM	Day 1 – Hatchery
Newcastle *	●		DW – SP – SC – IM	Number of vaccinations according to disease pressure
Gumboro	●		DW	2 live vaccinations recommended
Infectious Bronchitis *	●		DW – SP – SC – IM	Number of vaccinations according to disease pressure
AE	●		DW – SC – WW	Vaccination of PS and Commercials is recommended
Mycoplasmosis		●	SP – ED – SC – IM	Vaccination before transfer
Fowl Pox		●	WW	Vaccination before transfer
Pasteurellosis		●	SC	2 vaccinations approx. at week 8 and 14
Infectious Coryza		●	SC	2 vaccinations approx. at week 8 and 14
Salmonella		●	DW – SP – IM	Vaccination before transfer
ILT		●	DW – ED	2 vaccinations between 6–14 weeks

DW: Drinking Water

WW: Wing Web

SP: Spray

IM: Intramuscular Injection

ED: Eye Drop

SC: Subcutaneous Injection

Vaccination against Coccidiosis is optional for floor rearing systems

* An implementation of early live vaccination for Newcastle Disease (ND) and Infectious Bronchitis (IB) is of high value in order to induce local protection in the respiratory system of the chicks (priming effect). The right choice of vaccine is crucial. Never vaccinate very young birds with high-virulence live vaccine. Depending on infectious pressure, birds are vaccinated with inactivated vaccine during the rearing and/or prior onset of lay for booster the immunity. Revaccination with live ND and/or IB every 6–8 weeks during production period is beneficial in order to improve the local immunity.

A severe vaccination programme especially intramuscular injections may depress the body weight development.

BEAK TREATMENT

Beak treatment is not necessary under optimal conditions. In practice, it is widely used in environmental controlled and light-tight facilities, as an efficient precaution against cannibalism and feather pecking. Such behavior may develop at any age as a result of excessive light intensity, unbalanced feed, poor ventilation, overstocking or boredom.

Especially in floor management and/or open houses with uncontrollable light intensity, we recommend beak treatment subject to local animal welfare regulations. A very gentle and highly recommended method of beak treatment is the infrared treatment of the upper and lower beak by means of a special technique, performed shortly after chicks hatch. This procedure can already be done in the hatchery under very hygienic conditions by specially trained personnel. Another method of beak treatment is to treat the beaks with a hot blade.

Observe the following precautions for a conventional beak treatment:

- Treat only healthy, unstressed birds, at the age of 7 – 10 days.
- Allow only experienced personnel to do the work.
- Work slowly and carefully.
- Use only equipment and blades in perfect working order; adjust the blade temperature so that cauterization is guaranteed and the beak is not damaged.
- Adjust temperature and duration of the treatment according to the chicks' beak size, strength and quality.
- Do not feed for 12 hours before treating.
- Offer free feeding immediately after treating.
- Increase the level of feed in the troughs.
- Increase the temperature in the house for a few days after treating.
- For 3 – 5 days after beak treating provide an extra hour of light and supply feed in the late evening or at night.

Giving vitamins via the drinking water can also help to alleviate stress.

NUTRITION

General

To get the best out of the genetic performance potential of LOHMANN LSL-LITE layers, feeding them with a good structured mash feed with full nutritive value is a must. Such nutrition can best be guaranteed by a complete feed adapted to the performance potential.

Our feeding recommendations concentrate on the essential nutrients and are designed to cover the requirements for the best performance in every stage of development.

Ad Libitum Feed Supply

LOHMANN layers and their breeders are specialised birds selected for a high egg production. Because of their high turnover rates "feed into food", they have a big demand for nutrients.

Layers in full production convert roughly one third of the consumed nutrients into eggs. There is no danger in wasting feed by supplying feed ad libitum, because the hens can adjust their intake to the nutrient density of the feed. But there is a real danger in restricting birds in feed intake.

An undersupply of nutrients will harm the birds. They lose production and once exhausted, they easily can run into a health problem.

Feed Consumption

Feed consumption is mainly affected by:

- Body weight
- Performance
- House temperature: Low temperature increases the maintenance requirement for energy.
- Condition of feathering: Poor feathering condition due to management mistakes or malnutrition increases the maintenance requirement for energy.
- Feed texture: Coarse texture increases while fine texture decreases feed intake.
- Energy level: The higher the energy level of the feed, the lower the feed intake and vice versa.
- Nutrient imbalances: The hen will try to compensate for any nutrient deficits by increasing feed consumption especially in the latest stages of production.

NUTRITION

Table 5: Body Weight Development and Feed Consumption of LOHMANN LSL-LITE Pullets/Layers

Age in weeks	Body Weight				Feed*
	average lbs.	range in lbs.	average g	range in g	
1	0.15	0.15–0.16	70	68–72	Grower / Starter
2	0.26	0.26–0.27	120	116–124	
3	0.41	0.40–0.42	185	179–191	
4	0.56	0.55–0.58	255	247–263	
5	0.74	0.71–0.76	334	324–344	
6	0.94	0.91–0.97	425	412–438	
7	1.16	1.12–1.19	524	508–540	
8	1.39	1.35–1.43	630	611–649	
9	1.61	1.57–1.66	732	710–754	Developer
10	1.81	1.75–1.86	820	795–845	
11	1.96	1.90–2.02	889	862–916	
12	2.11	2.04–2.17	955	926–984	
13	2.25	2.18–2.31	1019	988–1050	
14	2.38	2.31–2.45	1081	1049–1113	
15	2.51	2.44–2.59	1140	1106–1174	
16	2.64	2.56–2.72	1196	1160–1232	
17	2.76	2.67–2.84	1251	1213–1288	
18	2.87	2.78–2.95	1300	1261–1339	Pre-Layer
19	2.97	2.88–3.06	1349	1309–1389	
20	3.08	2.99–3.17	1398	1356–1440	

* The basis for switching between diet types is the hens' body weight development.
The correct time for changing the diet is determined not by age but by body weight.
Chicks and pullets should therefore be weighed at regular intervals.

** 1 kcal = 4.187 kJ

*** Chicks / Pullets at all times should be supplied ad libitum with feed. The numbers are rough guidelines how much feed chicks / pullets eat.
Never limit feed intake to this numbers!

Table 6: Body Weight Development at intermediate Stages of LOHMANN LSL-LITE Pullets/Layers

Age in weeks	Body Weight		Average grams per bird on intermediate days					
	average in g	range in g	1	2	3	4	5	6
1	70	68–72	77	84	91	99	106	113
2	120	116–124	129	139	148	157	166	176
3	185	179–191	195	205	215	225	235	245
4	255	247–263	266	278	289	300	311	323
5	334	324–344	347	360	373	386	399	412
6	425	412–438	439	453	467	482	496	510
7	524	508–540	537	551	564	578	591	605
8	630	611–649	631	645	658	672	685	699
9	732	710–754	725	738	751	763	776	789
10	820	795–845	813	824	835	846	857	868
11	889	862–916	889	899	909	918	928	938
12	955	926–984	957	965	974	982	991	999
13	1019	988–1050	1016	1023	1031	1039	1047	1054
14	1081	1049–1113	1069	1076	1083	1091	1098	1105
15	1140	1106–1174	1118	1125	1131	1137	1143	1150
16	1196	1160–1232	1163	1169	1176	1183	1190	1196
17	1251	1213–1288	1210	1217	1224	1232	1239	1246
18	1300	1261–1339	1261	1269	1277	1286	1294	1302
19	1349	1309–1389	1319	1327	1336	1344	1353	1361
20	1398	1356–1440	1377	1384	1391	1399	1406	1413

NUTRITION

Table 7: Recommendations for Nutrient Levels for LOHMANN LSL-LITE Pullets

Diet type*		Starter**	Grower	Developer	Pre-Layer
Nutrient		1. – 3. week	4. – 8. week	9. – 16. week	17. week – 5 % Production
Metabol. Energy	kcal/kg	2800	2800	2800	2800
	kcal/lbs	1275	1275	1275	1275
Minimum	MJ/kg	12.00	11.70	11.70	11.70
Crude Protein	%	20.00	18.50	15.00	17.00
Methionine	%	0.48	0.40	0.34	0.36
Dig. Methionine	%	0.39	0.33	0.28	0.29
Methionine/Cystine	%	0.83	0.70	0.60	0.68
Digestible M./C.	%	0.68	0.57	0.50	0.56
Lysine	%	1.20	1.00	0.70	0.85
Digestible Lysine	%	0.98	0.82	0.57	0.70
Valine	%	0.89	0.75	0.53	0.64
Dig. Valine	%	0.76	0.64	0.46	0.55
Tryptophane	%	0.23	0.21	0.16	0.20
Dig. Tryptophane	%	0.19	0.17	0.13	0.16
Threonine	%	0.80	0.70	0.50	0.60
Dig. Threonine	%	0.65	0.57	0.40	0.49
Isoleucine	%	0.83	0.75	0.60	0.74
Dig. Isoleucine	%	0.68	0.62	0.50	0.61
Calcium	%	1.05	1.00	0.90	2.50
Phosphorus total***	%	0.75	0.70	0.58	0.65
Phosphorus available	%	0.48	0.45	0.37	0.45
Sodium	%	0.18	0.17	0.16	0.16
Chlorine	%	0.20	0.19	0.16	0.16
Linoleic Acid	%	2.00	1.40	1.00	1.00

* The basis for switching between diet types is the hens' body weight development. The correct time for changing the diet is determined not by age, but by body weight. Chicks and pullets, should therefore be weighed at regular intervals.

** Chick Starter should be fed until the standard body weight is reached or when daily feed intake is expected to be low.

*** without adding phytase

Nutrition and Egg Weight

Within certain limits egg weight can be adapted to farm specific requirements by adjusting rations. The following nutritional factors should be noted:

- Growing
 - Feeding for higher body weight/frame size increases the egg weight throughout the whole laying period.
- Feed composition
 - crude protein and methionine
 - linoleic acid
- Feeding technique
 - feed texture
 - feeding time
 - feed level in troughs
 - controlled feeding
 - frequency of feeding

By stimulating feed intake egg weight can be increased and can be limited by controlled feeding. Adjusting house temperature, when possible, can be used to affect feed consumption and egg weight.

Contact your LOHMANN specialists for specific programs with recommendations for nutrition and management adjusted to your conditions and requirements.

Table 4: Recommended Particle-Size Distribution for Chick Starter, Grower, Developer and Layer Feed (MASH)

Sieve Size	Passing Part	Sieve Size Interval	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 %
2.0 mm	90 %	1.51 – 2.0 mm	15 %
2.5 mm	100 %	> 2 mm	10 % *
			100 %

* Individual Particles not bigger than

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

The above table should be understood as an example for a homogenous mash feed structure. Different technique in feed production may lead to different particle sizes and variation. The overall target for mash feed structure needs to be optimal homogeneity. Mash feed with “some finer” or “some coarser” structure will be optimal as

well, as long the structure ensures optimal homogeneity. Variation in feed structure from batch to batch and within different feed deliveries should be as low as possible. A minimum amount of added fat and/or oil supports homogeneity and palatability of mash feed in the rearing and laying phase.

NUTRITION

Supplements

Supplements ensure the necessary supply of essential vitamins, trace elements and substances such as anti-oxidants or carotenoids. Suitable supplementation can compensate for the varying contents of raw materials and safeguard the supply of all necessary nutrients.

Remark: Vitamin C is synthesized by poultry normally and is not considered essential, however in some circumstances, like heat stress or hot climate, it may be important/beneficial to add 100 – 200 mg/kg complete feed during production period.

Table 13: Recommended Micro-Nutrient Specification

Supplements per kg Feed		Starter/Grower	Developer	Pre-Layer/Layer
Vitamin A*	I.U.	12000	12000	10000
Vitamin D ₃	I.U.	2000	2000	2500
Vitamin E	mg	20 – 30**	20 – 30**	15 – 30**
Vitamin K ₃	mg	3***	3***	3***
Vitamin B ₁	mg	1	1	1
Vitamin B ₂	mg	6	6	4
Vitamin B ₆	mg	3	3	3
Vitamin B ₁₂	mcg	20	20	25
Pantothenic Acid	mg	8	8	10
Nicotinic Acid	mg	30	30	30
Folic Acid	mg	1.0	1.0	0.5
Biotin	mcg	50	50	50
Choline	mg	300	300	400
Antioxidant	mg	100 – 150**	100 – 150**	100 – 150**
Coccidiostat		as required	as required	–
Manganese*	mg	100	100	100
Zinc*	mg	60	60	60
Iron	mg	25	25	25
Copper*	mg	5	5	5
Iodine	mg	0.5	0.5	0.5
Selenium*	mg	0.2	0.2	0.2

* Higher level might be possible according to local state and national regulations.

** So called "organic sources" should be considered with higher bioavailability.

*** according to fat addition **** double in case of heat treated feed

Table 14: Continuous Supply of Fine and Coarse Limestone (Recommended Relation in Feed)

Feed type	Fine Limestone 0 – 0.5 mm	Coarse Limestone * 1.5 – 3.5 mm
Pre Peak / Layer Phase 1	30 %	70 %
Layer Phase 2/3	25 %	75 %
Layer Phase 4/5	15 %	85 %

* can be partly replaced by oyster shells

Crude Fiber

Crude fiber, sometimes described as insoluble NSP*, may not have nutritional value for poultry, but it does have other benefits for a healthy and stable digestive physiology.

Used in the second half of the rearing period, it can positively influence the development of the digestive tract, the crop size and the appetite of pullets. This is beneficial for young layers, especially at the start of production, when the appetite of the birds is sometimes not sufficient enough to meet their nutrient demands. The tool has been proven to be very beneficial under varying feeding situations in a lot of countries.

This is the reason for the implementation of a minimum recommendation of crude fiber (5–6%) in the developer feed for LOHMANN layers.

Cereals and their by-products (e.g. bran) or oil seed by-products (e.g. meal of sunflowers or rapeseed), can be used as a source of crude fiber. DDGS** can be used as a source of crude fiber as well. Other raw materials, which are rich of crude fiber, may be used if available, but only as long as their inclusion does not reduce the energy level of the diet. With a classical corn-soy diet, the recommended crude fiber content can hardly be achieved. In such cases, other feed ingredients must be used. For advice, please contact the technical service department at LOHMANN.

* *Non-Starch Polysaccharides*

** *Dried Distillers Grains with Solubles*

Laying Period

LOHMANN LSL-LITE is easy to handle. Their feed intake capacity is genetically well established. After the onset of lay, phase feeding based on feed intake and egg mass output/day, is recommended. The application period of the different feed types in weeks can be slightly modified depending on the production development of a flock. Nevertheless, it must be taken into consideration that hens with outstanding production require higher calcium and lower phosphorus levels based on their age, which is a key aspect when changing phase feeds.

All 5 recommended phase feed types are based on an energy level of 11.7 MJ/kg/2800 kcal/kg (1270–1290 kcal/lbs) as well as 22 °C (72 °F) room temperature and well established plumage conditions. Under these conditions, a daily feed intake of 100–105 g (22.0–23.0 lbs./100/day) per LOHMANN LSL-LITE hen can be expected.

Phase Feeding

What is the basic idea of a phase feeding program for layers?

It is and should be a smooth and continuous adaptation to the – in detail daily – varying nutrient demand of a high prolific layer hen. The nutritional demand for protein, amino acids and the main minerals are changing constantly as the performance changes gradually from the start of lay, reaching the peak performance in terms of laying percentage and afterwards of egg mass output. Finally in aging layer flocks the egg shell quality is the biggest challenge and needs support from nutrition. All changes in diets need to follow the basic nutrient demand for egg mass production – means mainly amino acids – and the changing demand for optimal egg quality. As high prolific layers absolutely do not like big changes in the nutrient content of the feed and also in the physical feed structure – all changes

must be carried out in small steps and smoothly. Even the raw material composition of the diet should only be changed in small steps. If these requirements are ignored – production and egg quality can easily be affected.

Basic changes of the content of energy, protein and amino acids should be carried out only with regard to the egg mass performance of a layer flock. This means that as long as the egg mass output of a flock does not drop – one should not decrease any of these basic nutrients in order to prevent deficiencies which will/would finally harm the flock.

NUTRITION

**Table 8: Recommended Nutrient Levels for LOHMANN LSL-LITE Layers
for Different Daily Feed Consumptions**

Pre-Peak (approx. 18 weeks to 50% Production)

Nutrient		Daily Feed Consumption /Hen			
		95 g (20.9 lbs./100 birds)	100 g* (22.0 lbs./100 birds)	105 g (23.2 lbs./100 birds)	110 g (24.3 lbs./100 birds)
Protein	%	20.00	18.95	18.00	17.14
Calcium**	%	4.22	4.00	3.80	3.62
Phosphorus***	%	0.71	0.68	0.64	0.61
Av. Phosphorus	%	0.50	0.47	0.45	0.43
Sodium	%	0.20	0.19	0.18	0.17
Chlorine	%	0.20	0.19	0.18	0.17
Lysine	%	0.93	0.89	0.84	0.80
Dig. Lysine	%	0.77	0.73	0.69	0.66
Methionine	%	0.46	0.44	0.41	0.39
Dig. Methionine	%	0.38	0.36	0.34	0.32
Meth./Cyst.	%	0.84	0.80	0.76	0.72
Dig. M/C	%	0.69	0.65	0.62	0.59
Arginine	%	0.96	0.91	0.87	0.82
Dig. Arginine	%	0.79	0.75	0.71	0.68
Valine	%	0.78	0.74	0.71	0.67
Dig. Valine	%	0.67	0.63	0.60	0.57
Tryptophane	%	0.20	0.19	0.18	0.17
Dig. Tryptophane	%	0.17	0.16	0.15	0.14
Threonine	%	0.65	0.62	0.59	0.56
Dig. Threonine	%	0.53	0.51	0.48	0.46
Isoleucine	%	0.75	0.71	0.67	0.64
Dig. Isoleucine	%	0.61	0.58	0.55	0.52
Linoleic Acid	%	2.44	2.32	2.20	2.10

* equals daily intake requirement of nutrient in g/hen or lbs. per 100 birds

** See table 14 about relation of fine and coarse limestone.

*** without phytase

**Table 9: Recommended Nutrient Levels for LOHMANN LSL-LITE Layers in Phase 1
for Different Daily Feed Consumptions**

(approx. 50 % Production to 40 weeks)*

Nutrient		Daily Feed Consumption /Hen			
		95 g** (20.9 lbs./100 birds)	100 g (22.0 lbs./100 birds)	105 g (23.2 lbs./100 birds)	110 g (24.3 lbs./100 birds)
Protein	%	18.57	17.64	16.80	16.04
Calcium***	%	4.32	4.10	3.90	3.73
Phosphorus****	%	0.66	0.63	0.60	0.57
Av. Phosphorus	%	0.46	0.44	0.42	0.40
Sodium	%	0.19	0.18	0.17	0.16
Chlorine	%	0.19	0.18	0.17	0.16
Lysine	%	0.87	0.82	0.79	0.75
Dig. Lysine	%	0.71	0.68	0.64	0.61
Methionine	%	0.43	0.41	0.39	0.37
Dig. Methionine	%	0.35	0.33	0.32	0.30
Meth./Cyst.	%	0.78	0.74	0.71	0.67
Dig. M/C	%	0.64	0.61	0.58	0.55
Arginine	%	0.89	0.85	0.81	0.77
Dig. Arginine	%	0.73	0.70	0.66	0.63
Valine	%	0.73	0.69	0.66	0.63
Dig. Valine	%	0.62	0.59	0.56	0.53
Tryptophane	%	0.19	0.18	0.17	0.16
Dig. Tryptophane	%	0.15	0.15	0.14	0.13
Threonine	%	0.60	0.57	0.55	0.52
Dig. Threonine	%	0.50	0.47	0.45	0.43
Isoleucine	%	0.69	0.66	0.63	0.60
Dig. Isoleucine	%	0.57	0.54	0.51	0.49
Linoleic Acid	%	2.32	2.20	2.10	2.00

* Until the maximum daily egg mass is reached, please refer to table 21.

** equals daily intake requirement of nutrient in g/hen or lbs. per 100 birds

*** See table 14 about relation of fine and coarse limestone.

**** without phytase

NUTRITION

**Table 10: Recommended Nutrient Levels for LOHMANN LSL-LITE Layers in Phase 2
for Different Daily Feed Consumptions**

(approx. 41 to 50 weeks)*

Nutrient		Daily Feed Consumption /Hen			
		95 g** (20.9 lbs./100 birds)	100 g (22.0 lbs./100 birds)	105 g (23.2 lbs./100 birds)	110 g (24.3 lbs./100 birds)
Protein	%	18.19	17.28	16.46	15.71
Calcium***	%	4.42	4.20	4.00	3.82
Phosphorus****	%	0.65	0.62	0.59	0.56
Av. Phosphorus	%	0.45	0.43	0.41	0.39
Sodium	%	0.18	0.17	0.16	0.16
Chlorine	%	0.18	0.17	0.16	0.16
Lysine	%	0.85	0.81	0.77	0.73
Dig. Lysine	%	0.70	0.66	0.63	0.60
Methionine	%	0.42	0.40	0.38	0.36
Dig. Methionine	%	0.34	0.33	0.31	0.30
Meth./Cyst.	%	0.76	0.73	0.69	0.66
Dig. M/C	%	0.63	0.60	0.57	0.54
Arginine	%	0.87	0.83	0.79	0.76
Dig. Arginine	%	0.72	0.68	0.65	0.62
Valine	%	0.71	0.68	0.65	0.62
Dig. Valine	%	0.61	0.58	0.55	0.52
Tryptophane	%	0.18	0.18	0.17	0.16
Dig. Tryptophane	%	0.15	0.14	0.14	0.13
Threonine	%	0.59	0.56	0.54	0.51
Dig. Threonine	%	0.49	0.46	0.44	0.42
Isoleucine	%	0.68	0.64	0.61	0.59
Dig. Isoleucine	%	0.56	0.53	0.50	0.48
Linoleic Acid	%	1.68	1.60	1.52	1.45

* Until the maximum daily egg mass is reached, please refer to table 21.

** equals daily intake requirement of nutrient in g/hen or lbs. per 100 birds

*** See table 14 about relation of fine and coarse limestone.

**** without phytase

**Table 11: Recommended Nutrient Levels for LOHMANN LSL-LITE Layers in Phase 3
for Different Daily Feed Consumptions**

(approx. 51 to 65 weeks)*

Nutrient		Daily Feed Consumption /Hen			
		95 g** (20.9 lbs./100 birds)	100 g (22.0 lbs./100 birds)	105 g (23.2 lbs./100 birds)	110 g (24.3 lbs./100 birds)
Protein	%	17.62	16.74	15.94	15.22
Calcium***	%	4.53	4.30	4.10	3.91
Phosphorus****	%	0.63	0.60	0.57	0.54
Av. Phosphorus	%	0.44	0.42	0.40	0.38
Sodium	%	0.18	0.17	0.16	0.15
Chlorine	%	0.18	0.17	0.16	0.15
Lysine	%	0.82	0.78	0.75	0.71
Dig. Lysine	%	0.68	0.64	0.61	0.58
Methionine	%	0.41	0.39	0.37	0.35
Dig. Methionine	%	0.33	0.32	0.30	0.29
Meth./Cyst.	%	0.74	0.70	0.67	0.64
Dig. M/C	%	0.61	0.58	0.55	0.52
Arginine	%	0.85	0.81	0.77	0.73
Dig. Arginine	%	0.70	0.66	0.63	0.60
Valine	%	0.69	0.66	0.63	0.60
Dig. Valine	%	0.59	0.56	0.53	0.51
Tryptophane	%	0.18	0.17	0.16	0.15
Dig. Tryptophane	%	0.15	0.14	0.13	0.13
Threonine	%	0.57	0.54	0.52	0.49
Dig. Threonine	%	0.47	0.45	0.43	0.41
Isoleucine	%	0.66	0.62	0.59	0.57
Dig. Isoleucine	%	0.54	0.51	0.49	0.47
Linoleic Acid	%	1.47	1.40	1.33	1.27

* After the maximum daily egg mass is reached, please refer to table 21.

** equals daily intake requirement of nutrient in g/hen or lbs. per 100 birds

*** See table 14 about relation of fine and coarse limestone.

**** without phytase

NUTRITION

**Table 12: Recommended Nutrient Levels for LOHMANN LSL-LITE Layers in Phase 4
for Different Daily Feed Consumptions**

(approx. after week 65)

Nutrient		Daily Feed Consumption /Hen			
		95 g* (20.9 lbs./100 birds)	100 g (22.0 lbs./100 birds)	105 g (23.2 lbs./100 birds)	110 g (24.3 lbs./100 birds)
Protein	%	17.05	16.20	15.43	14.73
Calcium **	%	4.74	4.50	4.29	4.09
Phosphorus ***	%	0.61	0.58	0.55	0.53
Av. Phosphorus	%	0.43	0.41	0.39	0.37
Sodium	%	0.17	0.16	0.15	0.15
Chlorine	%	0.17	0.16	0.15	0.15
Lysine	%	0.80	0.76	0.72	0.69
Dig. Lysine	%	0.65	0.62	0.59	0.56
Methionine	%	0.39	0.37	0.36	0.34
Dig. Methionine	%	0.32	0.31	0.29	0.28
Meth./Cyst.	%	0.72	0.68	0.65	0.62
Dig. M/C	%	0.59	0.56	0.53	0.51
Arginine	%	0.82	0.78	0.74	0.71
Dig. Arginine	%	0.67	0.64	0.61	0.58
Valine	%	0.67	0.64	0.61	0.58
Dig. Valine	%	0.57	0.54	0.51	0.49
Tryptophane	%	0.17	0.16	0.16	0.15
Dig. Tryptophane	%	0.14	0.14	0.13	0.12
Threonine	%	0.55	0.53	0.50	0.48
Dig. Threonine	%	0.45	0.43	0.41	0.39
Isoleucine	%	0.64	0.60	0.57	0.55
Dig. Isoleucine	%	0.52	0.50	0.47	0.45
Linoleic Acid	%	1.26	1.20	1.14	1.09

* equals daily intake requirement of nutrient in g/hen or lbs. per 100 birds

** See table 14 about relation of fine and coarse limestone.

*** without phytase

Rearing

A nutrient balanced diet during the rearing stage is essential to enable the chick to develop into a mature pullet. Chicks and pullets should be fed a coarse diet (for particle sizes see table on page 11) of a meal-type consistency. A high proportion of very fine components or a structure that is too coarse can lead to selective feed intake and an unbalanced nutrient supply. A diet with an extremely fine consistency reduces the feed intake of the birds and can result in a lacking supply of certain nutrients. If pelletizing of feed is inevitable for hygienic reasons the pellets should be crumbled to the recommended consistency. During the different growth phases of chicks and pullets, qualitatively different feed varieties should be used in which the nutrient content meets the birds changing needs.

The diets are matched to the nutrient requirement and weight development at each stage of growth. The use of chick starter is recommended if the standard body-weight is not reached by feeding grower feed or if the daily feed intake is expected to be low. The switch to developer should only be made when the standard body weight has been reached. A reduced nutrient density and an increased content of crude fiber (5–6 %) during this phase is beneficial for improving the eating capacity.

The pre-layer diet has about twice the calcium content of developer as well as higher levels of protein and amino acids. Feeding such a diet for about 10 days prior to the planned start of lay is therefore beneficial. This diet improves flock uniformity by providing a better nutrient supply to late maturing birds and by enabling early maturing birds to obtain sufficient calcium for eggshell production of the first eggs.

Correct Use of Pre-Layer Feed

Pre-layer feed should be used for a short period of time before a flock starts being supplied with Pre-Peak diet. This leads to a smooth transition from the developer feed (low calcium and low nutrient density) to a diet with high calcium and nutrient levels. It helps to avoid the often reduced appetite/daily feed intake during early production. Typically, pre-layer feed contains about 2.0–2.5 % calcium. This is too much for a typical feed for rearing but not enough for a bird starting to produce eggs. From a nutritional point of view, it's therefore considered a compromise and never as "optimal" feed. Nevertheless, it's worthwhile to use pre-layer feed for a short period of time, and correct use can enhance the uniformity of a pullet flock, especially for flocks with very low uniformity. It can also aid the development of Ca-metabolism in medullar bones. Since pre-layer feed does not meet the nutrient requirements of a layer in full production, it only should be used for a short period and only when timing and logistics permit.

Please consider the following recommendations while using pre-layer feed:

- Start using pre-layer feed depending on the birds sexual maturity, age and their standard body weights.
- Use pre-layer feed for about 10 days with a maximum of 1 kg (2.2 lbs.) per bird.
- The wrong way to use pre-layer feed is either to start using it too early and/or use it too long.

Start feeding pre-layer feed two weeks before anticipated onset of lay and change to layer feed before 5 % production.

Age at transfer		Feeding programme		
week	days	Developer Feed kg feed	followed by →	Pre-Layer Feed kg feed
15	105	1.0	→	1.0
16	112	0.5	→	1.0
17	119	–	→	1.0
18	126	–	→	0.5
after 18	after 126	immediately supply start lay feed or layer phase 1 feed		

LIGHTING

General

The lighting program controls the onset of lay and affects the performance. Within certain limits, performance can be adapted to farm specific requirements by adjusting the lighting program. Easiest to follow are the lighting programs in closed houses without the effect of natural daylight. In these, the hours of light and light intensity can be adjusted to changing needs. Rearing birds in closed houses and producing eggs in light-tight houses enable the producers to maximize performance. Follow the lighting program which is recommended for this type of housing system.

Closed houses are not feasible in every case. For open or brown-out houses, a tailor-made program has to be developed depending on the season and geographical location where pullets are being reared and stimulated to lay.

In general, the lighting program should follow the basic principles:

- **Never increase hours of light during the rearing period.**
- **Never decrease hours of light during the production period**
- **Always keep in mind that artificial and natural daylight can have an influence in open or brown-out houses.**

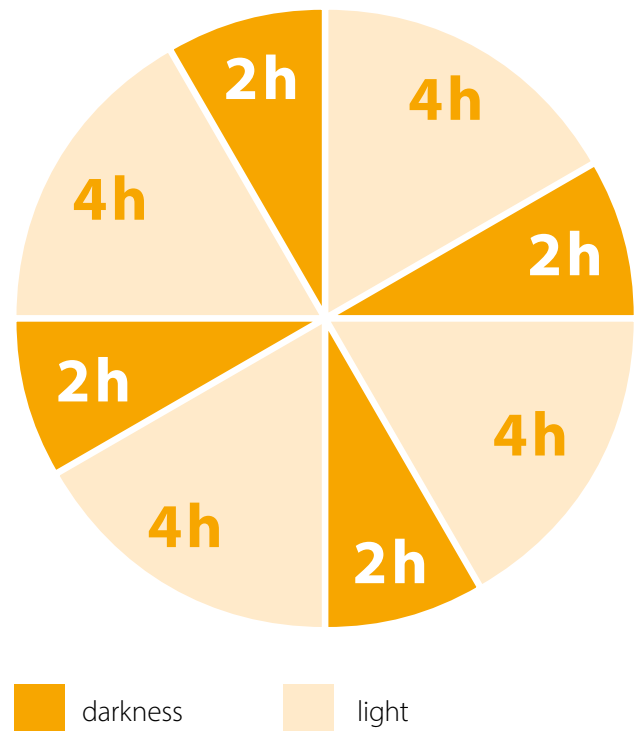
Intermittent Lighting Program for Day Old Chicks

When the day old chicks arrive on the farm, they have already been intensively handled in the hatchery and often have a long transport to their final destination. Common practice is to give them 24 hours of light to help them recover in the first 2 or 3 days after arrival and to provide them enough time to eat and drink. In practice, it can be observed that after arrival and housing, some chicks continue to sleep whereas others start to look for feed and water. The activity of the flock will always be irregular. Especially in this phase, poultry men have difficulties interpreting the chicks behavior and their condition.

There is a practically proven principal in splitting the day into phases of resting and activity using a special designed intermittent lighting program. The aim is to synchronize the chicks' activities. The farmer gets a better impression of the flocks condition and the birds are encouraged by the groups behavior to search for water and feed.

Therefore, LOHMANN advises to give chicks a rest after they arrive at the rearing farm and then start with four hours of light followed by two hours of darkness.

Lighting Program after Arrival



This program can be used for up to 7 or 10 days after arrival, then switch to the regular step down lighting program. The use of the following lighting program brings about the following advantages:

- The chicks will rest and/or sleep at the same time. This means that the behavior of the chicks will be synchronized.
- Weak chicks will be stimulated by stronger ones to move as well as to eat and drink.
- The behavior of the flock is more uniform and the monitoring of the birds is made easier.
- Mortality will decrease.

Lighting Program for Closed Houses

To which extent lighting hours are reduced during the growing period, and the time when stimulation begins by increasing the lighting hours, are means by which performance can be adjusted to specific farm requirements. The following Standard Lighting Program is designed for a quick start into production.

Depending on the development of the pullets' body weight, the program can be accompanied by controlled feeding between 10 – 15 weeks of age.

Table 15: Lighting Program for Windowless Houses for LOHMANN LSL-LITE Pullets/Layers

Age (Weeks)	Hours of Light (Standard)	Light Intensity (Lux)	
		Foot Candle	Lux
Day 1 – 2 *	24	2 – 4	20 – 40
Day 3 – 6 *	16	2 – 3	20 – 30
2	14	1 – 2	10 – 20
3	13	1 – 2	10 – 20
4	12	0.4 – 0.6	4 – 6
5	11	0.4 – 0.6	4 – 6
6	10	0.4 – 0.6	4 – 6
7	9	0.4 – 0.6	4 – 6
8	9	0.4 – 0.6	4 – 6
9	9	0.4 – 0.6	4 – 6
10	9	0.4 – 0.6	4 – 6
11	9	0.4 – 0.6	4 – 6
12	9	0.4 – 0.6	4 – 6
13	9	0.4 – 0.6	4 – 6
14	9	0.4 – 0.6	4 – 6
15	9	0.4 – 0.6	4 – 6
16	9	0.4 – 0.6	4 – 6
17	10	1 – 2	10 – 20
18	11	1 – 2	10 – 20
19	12	1 – 2	10 – 20
20	13	1 – 2	10 – 20
21	14	1 – 2	10 – 20
22	15	1 – 2	10 – 20
23	15 – 16	1 – 2	10 – 20
24	15 – 16	1 – 2	10 – 20
25	15 – 16	1 – 2	10 – 20
26	15 – 16	1 – 2	10 – 20
27	15 – 16	1 – 2	10 – 20
28	15 – 16	1 – 2	10 – 20
29	15 – 16	1 – 2	10 – 20
30**	15 – 16	1 – 2	10 – 20

* or run an Intermittent Lighting Program

** until the end of production

LIGHTING

Growing in Closed House to Open House Production

The lighting program for closed houses, the step down procedure and the subsequent constant day length between 7–10 weeks of age, have to be adjusted to the length of the day at the time when the birds have to be transferred to the layer house. This depends on the season and the latitude of where the farms are located. Birds hatched in the first days of December and placed at 40°N. Latitude, will be exposed to a nearly 13-hour length of day at 17 weeks of age. The step down program for such a flock should stop at 13 hours and guarantee a constant day length of 13 hours from week 3 until transfer. At week 19, the flock should be exposed to a 120-minutes increase in day length. A weekly increase of 60 minutes until the maximal day length of 16 hours is sufficient to induce stimulation. If the day length at the time of transfer is more than 14 hours per day, an increase of 30 minutes can be used to prolong the light stimulation period. Light intensity has to be adapted to natural daylight 2–3 weeks prior to transfer.

Growing in Open House to Open House Production

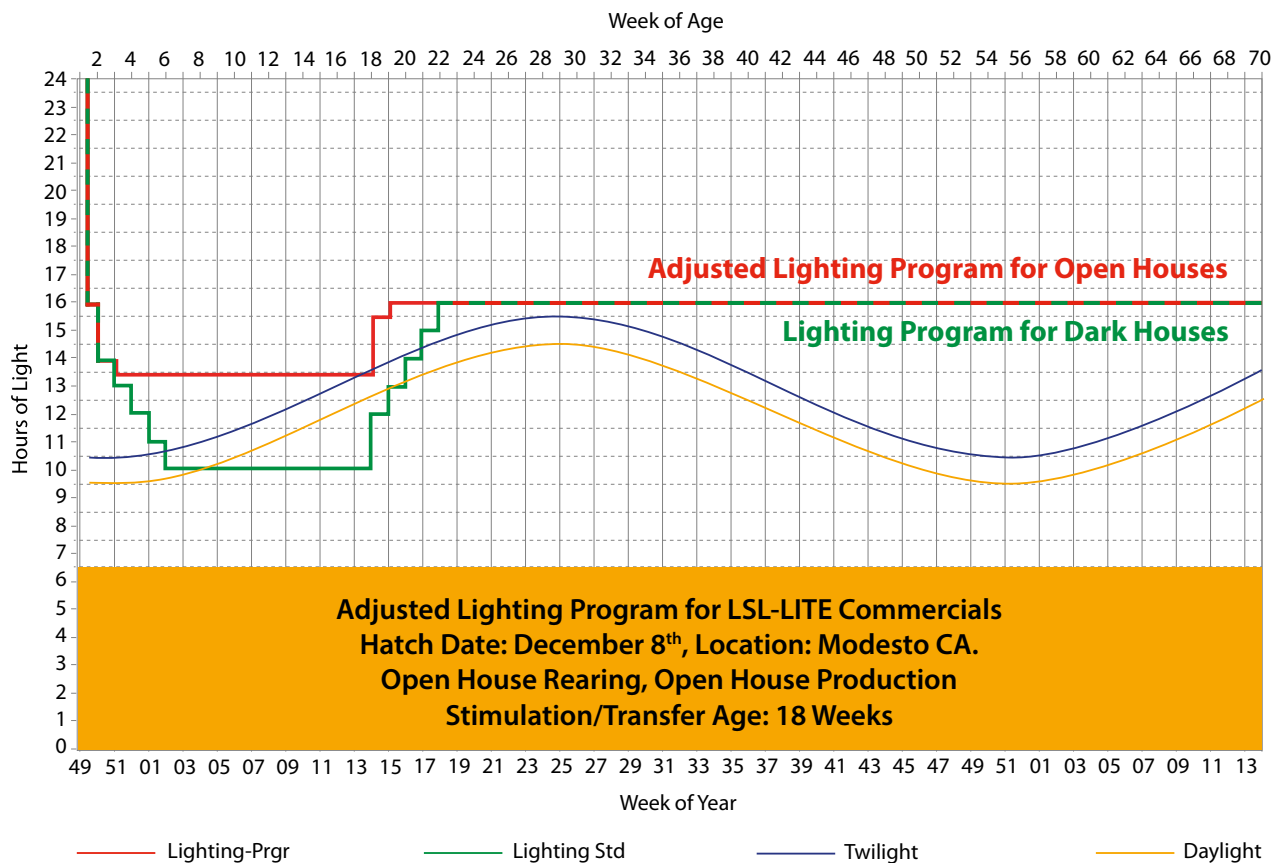
The lighting program and the step down procedure have to be adjusted to the longest length of day to which the birds are exposed to in the period from 3 to 17 weeks of age. Birds which are hatched in the first days of April and are reared at 20°N. Latitude, will be exposed to a 13-hour day length up to 17 weeks of age, maximum. This will determine the clock setting during rearing. At week 19, the flock should be exposed to a 120-minutes longer day length. A weekly increase of 30 minutes until the maximal length of day with 16 hours is sufficient for stimulation.

Growing in Open House to Closed House Production

For pullets which have been reared in open houses and then transferred to closed houses, please refer to the recommendations as stated in "Growing in Open House to Open House Production".

Lighting Program for Open Houses

An example of a lighting program for LOHMANN LSL-LITE Layers adjusted to location, condition and requirements by LOHMANN lighting program tool



Extremes

A very extreme situation will occur when the birds are reared during Spring and Summer at 50° N. Latitude in non-light tight houses. They will be exposed to a nearly 17-hour length of day in June. Good light stimulation for these flocks is almost impossible. Therefore, we generally recommend to rear layers in light-tight houses.

Attention: Natural daylight and artificial lighting program during rearing and production have to be synchronized. Additional artificial lighting has to be adjusted to the seasonal fixed sunrise and sunset.

LIGHTING

Table 16: Hours between sunrise and sunset in the Northern and Southern Hemisphere

Northern Date	0°		10°		20°		30°		40°		50°		Southern Date
	Hours	Minutes	Hours	Minutes	Hours	Minutes	Hours	Minutes	Hours	Minutes	Hours	Minutes	
Jan 05	12	7	11	34	10	59	10	17	9	27	8	14	Jul 05
Jan 20	12	7	11	38	11	5	10	31	9	47	8	45	Jul 20
Feb 05	12	7	11	44	11	19	10	52	10	19	9	32	Aug 05
Feb 20	12	6	11	50	11	35	11	16	10	55	10	23	Aug 20
Mar 05	12	6	11	58	11	49	11	38	11	28	11	11	Sep 05
Mar 20	12	6	12	7	12	6	12	6	12	7	12	9	Sep 20
Apr 05	12	6	12	14	12	25	12	35	12	49	13	8	Oct 05
Apr 20	12	6	12	24	12	41	13	2	13	27	14	3	Oct 20
May 05	12	7	12	31	12	56	13	26	14	2	14	54	Nov 05
May 20	12	7	12	37	13	8	13	45	14	32	15	37	Nov 20
Jun 05	12	7	12	41	13	17	14	0	14	53	16	9	Dec 05
Jun 20	12	7	12	42	13	20	14	5	15	1	16	22	Dec 20
Jul 05	12	7	12	41	13	19	14	1	14	55	16	14	Jan 05
Jul 20	12	7	12	37	13	11	13	49	14	38	15	46	Jan 20
Aug 05	12	7	12	32	12	59	13	29	14	9	15	2	Feb 05
Aug 20	12	6	12	25	12	44	13	6	13	35	14	14	Feb 20
Sep 05	12	6	12	17	12	26	12	40	12	55	13	16	Mar 05
Sep 20	12	6	12	8	12	10	12	13	12	16	12	22	Mar 20
Oct 05	12	7	12	1	11	53	11	46	11	37	11	26	Apr 05
Oct 20	12	7	11	52	11	36	11	20	10	59	10	31	Apr 20
Nov 05	12	7	11	44	11	20	10	55	10	21	9	36	May 05
Nov 20	12	7	11	38	11	7	10	34	9	51	8	51	May 20
Dec 05	12	7	11	35	10	59	10	19	9	29	8	18	Jun 05
Dec 20	12	7	11	33	10	55	10	13	9	20	8	5	Jun 20

GENERAL RECOMMENDATIONS

Hygiene

- › Set up the farm at a safe distance from other poultry houses and fence in.
- › Keep birds of only one age group on the farm.
- › Keep no other poultry on the farm.
- › Allow no visitors to enter the farm.
- › Wear only the farm's own protective clothing within the farm area.
- › Provide the farm's own protective clothing for veterinarians, service and maintenance workers and consultants.
- › Disinfect boots before entering the houses.
- › Use bulk feed if possible. Do not allow the truck driver to enter the houses.
- › Safeguard the houses against wild birds and vermin. Keep rats and mice under constant control.
- › Dispose of dead birds hygienically. Follow local laws and regulations.

Daily Control

Check at least once daily:

- › Health status
- › Temperature
- › Ventilation
- › Feed and water consumption
- › Lighting
- › Mortality

When assessing the state of health, do not just go by the general impression and mortality rate, but also take note of feed and water consumption as well as the consistency of droppings.

Water Supply

Clean water is as equally important as good feed for top performance. Therefore fresh, clean, potable water must be available at all times for the layers and an adequate consumption must always be assured. A water meter is a very useful tool to monitor water consumption. The optimal water temperature is about 20°C (68°F).

Furthermore feed and water intake are closely correlated. If birds don't drink enough water for any reason, feed intake is consequently reduced.

The water to feed ratio at comfortable temperature is around 1.8–2:1, but this relation increases up to 5:1 at high ambient temperatures above 30°C (86°F). During exposure to high temperatures, birds consume less feed, but more water in an effort to cool their body down.

Check the water quality regularly, especially if you use your own water supply like well water.

For example excessive salt levels in drinking water can cause persistent damage to shell quality and hard water with high TDS* levels may cause kidney damage.

**TDS: Total Dissolved Solids*

Grit

Feeding grit is not a must but is recommended when rations are supplemented by grains. This stimulates the development of the crop and the gizzard during the rearing period, which in turn has a positive effect on feed intake capacity.

Table 17: Amount and Granulation of Grit Dependent on Age

Week 1 – 2	once a week 1 g/bird (size 1 – 2 mm / 0.04 – 0.08 in)
Week 3 – 8	once a week 2 g/bird (size 3 – 4 mm / 0.12 – 0.16 in)
From week 9	once a month 3 g/bird (size 4 – 6 mm / 0.16 – 0.24 in)

GERNERAL RECOMMENDATIONS

Egg Quality and Egg Collection

LOHMANN LSL-LITE layers produce eggs of excellent quality. To preserve the quality, the following points should be observed:

- > Collect eggs at least once a day.
- > Store eggs at temperatures of 7 °C (45 °F) with a relative humidity between 80–85 %.

Storing at higher temperatures and lower humidity leads to rapid loss of weight and impairs the quality of the egg white due to an increase in gas exchange.

Nests (Non Cage Housing)

The quality of nests is also a factor that affects egg quality. Renew the litter in litter-type nests regularly and keep them clean. Provide individual nests at a rate of one nest per 4 hens. Collect floor eggs frequently to keep their rate as low as possible.

In addition to sufficient nesting space in family type nests, the following factors are important for a low rate of floor eggs:

- > Clean, dry litter or soft nest lining
- > Easy access
- > Even distribution of the nests within the barn
- > Only one type of nest in the barn

For optimum egg quality, rollaway nests in combination with slats are better than litter-type nests or family type nests.

Litter (Non Cage Housing)

Only use shavings from untreated wood in order to avoid poisoning and residues in the egg.

Provide sufficient ventilation to ensure good litter condition and remove wet litter, if necessary.

Space Requirements

Table 18: Space Allowances and Equipment for Rearing

Equipment \ Age	Cage Rearing			Floor Rearing	
		0 – 4 weeks	5 – 17 weeks	0 – 4 weeks	5 – 17 weeks
Chicks/Hover				500	
Floor Space		140 sq cm/bird 22 sq in /bird	285 sq cm/bird 44 sq in/bird	20 birds/sq m 0.5 sq ft/bird	10 birds/sq m 1 sq ft/bird
Feeder Space	trough (cm/bird)	2.5	5	4	8
	trough (in/bird)	1	2	1.5	3
	pan (birds/pan)	24	12	60	30
Water Space	birds/cup	16	8	50	25
	birds/nipple	16	8	20	10
	birds/fountain	50 (mini)	–	150	75
	trough (cm/bird)	1.25	2.5	1.25	2.5
	trough (in/bird)	0.5	1	0.5	1

Table 19: Space Recommendations and Equipment for Laying

	Floor Space			Feeder Space		Water Space		
	Cage Area	Light Controlled Floor	Open Floor	Trough/ Bird	Birds/ Tube or Pan	Birds/ Nipple or Cup	Birds/ Fountain	Trough/ Bird
Recommended*	456 sq cm/bird 72 sq in/bird	8.5. birds/sq m 1.25 ft/bird	8.5 birds/sq m 1.25 sq ft/bird	10 cm 4 in	20 1.5 in	6	50	4 cm
Minimum	350 sq cm/bird 54 sq in/bird	10 birds/sq m 1.0 sq ft/bird	10 birds/sq m 1.0 sq ft/bird	8 cm 3 in	25	8 8	75	2.5 cm 1.0 in

*Follow the local laws and statutory regulations.

Birds which are kept on the floor during production, must also be reared on the floor.

An important aspect of floor rearing is to develop immunity against Coccidiosis. We recommend vaccination as the most reliable method to achieve this goal. never use Coccidiostats in the feed when pullets are vaccinated.

Stocking Density

The stocking density will vary with environmental conditions and equipment types.

Please follow the local legislations in your country/area.

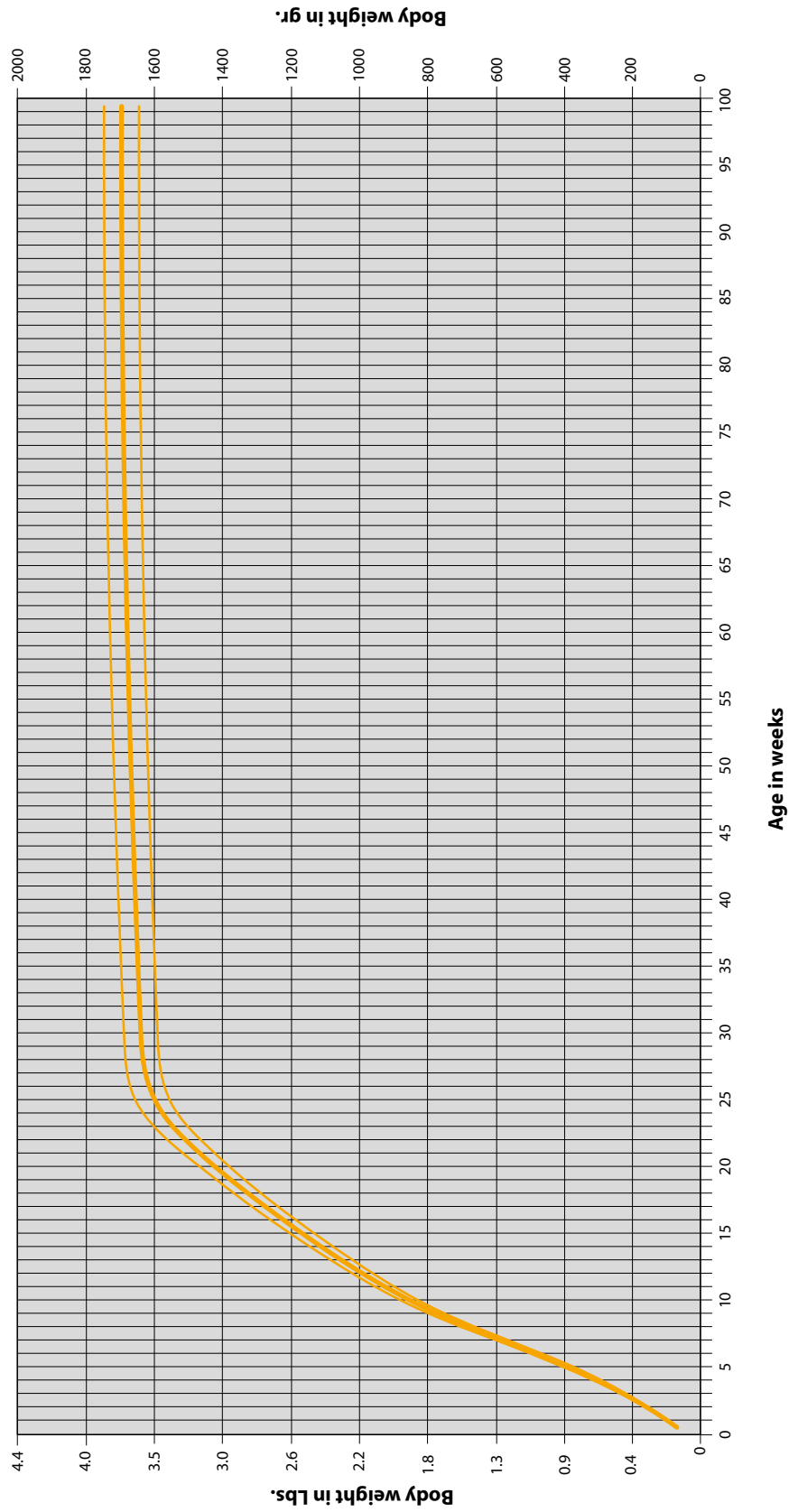
GERNERAL INFORMATION

Table 20: Body Weight Development of LOHMANN LSL-LITE

Week 1 – 100

Age in Weeks	Weight Range (g)		Age in Weeks	Weight Range (g)		Age in Weeks	Weight Range (g)	
	lbs.	gram		lbs.	gram		lbs.	gram
1	0.15–0.16	68–72	35	3.53–3.74	1600–1698	69	3.61–3.83	1637–1739
2	0.26–0.27	116–124	36	3.53–3.75	1601–1700	70	3.61–3.84	1638–1740
3	0.40–0.42	179–191	37	3.53–3.75	1602–1702	71	3.61–3.84	1638–1740
4	0.55–0.58	247–263	38	3.53–3.75	1603–1703	72	3.61–3.84	1639–1741
5	0.71–0.76	324–344	39	3.54–3.76	1605–1705	73	3.62–3.84	1640–1742
6	0.91–0.97	412–438	40	3.54–3.76	1606–1706	74	3.62–3.84	1640–1742
7	1.12–1.19	508–540	41	3.55–3.76	1608–1708	75	3.62–3.84	1641–1743
8	1.35–1.43	611–649	42	3.55–3.77	1609–1709	76	3.62–3.84	1641–1743
9	1.57–1.66	710–754	43	3.55–3.77	1611–1711	77	3.62–3.84	1642–1744
10	1.75–1.86	795–845	44	3.55–3.77	1612–1712	78	3.62–3.84	1642–1744
11	1.90–2.02	862–916	45	3.56–3.78	1613–1713	79	3.62–3.85	1643–1745
12	2.04–2.17	926–984	46	3.56–3.78	1615–1715	80	3.62–3.85	1643–1745
13	2.18–2.31	988–1050	47	3.56–3.78	1616–1716	81	3.62–3.85	1644–1746
14	2.31–2.45	1049–1113	48	3.56–3.79	1617–1717	82	3.62–3.85	1644–1746
15	2.44–2.59	1106–1174	49	3.57–3.79	1618–1718	83	3.62–3.85	1644–1746
16	2.56–2.72	1160–1232	50	3.57–3.79	1620–1720	84	3.63–3.85	1645–1747
17	2.67–2.84	1213–1288	51	3.57–3.79	1621–1721	85	3.63–3.85	1645–1747
18	2.78–2.95	1261–1339	52	3.58–3.80	1622–1722	86	3.63–3.85	1645–1747
19	2.88–3.06	1309–1389	53	3.58–3.80	1623–1723	87	3.63–3.85	1645–1747
20	2.99–3.17	1356–1440	54	3.58–3.80	1624–1724	88	3.63–3.85	1646–1748
21	3.09–3.28	1402–1488	55	3.58–3.80	1625–1725	89	3.63–3.85	1646–1748
22	3.18–3.38	1444–1534	56	3.58–3.81	1626–1726	90	3.63–3.85	1646–1748
23	3.27–3.47	1483–1575	57	3.59–3.81	1628–1728	91	3.63–3.85	1646–1748
24	3.35–3.56	1519–1613	58	3.59–3.81	1629–1729	92	3.63–3.85	1646–1748
25	3.42–3.63	1550–1646	59	3.59–3.81	1630–1730	93	3.63–3.85	1646–1748
26	3.46–3.68	1570–1668	60	3.59–3.81	1630–1730	94	3.63–3.85	1646–1748
27	3.48–3.70	1579–1677	61	3.59–3.82	1631–1731	95	3.63–3.85	1646–1748
28	3.49–3.71	1585–1683	62	3.60–3.82	1632–1732	96	3.63 3.86	1647 1749
29	3.50–3.72	1589–1687	63	3.60–3.82	1633–1733	97	3.63 3.86	1647 1749
30	3.51–3.72	1591–1689	64	3.60–3.82	1633–1735	98	3.63 3.86	1647 1749
31	3.51–3.73	1593–1691	65	3.60–3.83	1634–1736	99	3.63 3.86	1647 1749
32	3.52–3.73	1595–1693	66	3.61–3.83	1635–1737	100	3.63 3.86	1647 1749
33	3.52–3.74	1596–1694	67	3.61–3.83	1635–1737			
34	3.52–3.74	1598–1696	68	3.61–3.83	1636–1738			

Growth and Body Weight (lbs.) Development Curve of LOHMANN LSL-LITE



GERNERAL INFORMATION

Table 21: LOHMANN LSL-LITE Performance Goals (Week 19 – 59)

Age in weeks	Egg No. per H.H. cumul.	Rate of Lay %		Egg weight in week			Egg weight cumulative			% Grade A Large & Above		Egg mass			
		per H.H.	per H.D.	g	Oz./ Doz.	Net. Lbs./ 30 Doz. Case	cumul.	Oz./ Doz.	Net. Lbs./ 30 Doz. Case	23 Oz.	24 Oz.	g/ H.D. in week	Oz./ Doz./ H.D. in week	cumul.	cumul. lbs./ H.H.
19	0.7	10.1	10.2	41.2	17.4	32.7	41.2	17.4	32.7	0.0	0.0	4.2	1.8	0.03	0.1
20	3.3	37.6	37.7	43.9	18.6	34.8	43.3	18.3	34.4	0.0	0.0	16.5	7.0	0.14	0.3
21	7.2	55.6	55.7	46.8	19.8	37.1	45.2	19.1	35.9	0.7	0.1	26.0	11.0	0.33	0.7
22	12.3	72.6	72.8	49.2	20.8	39.0	46.8	19.8	37.2	5.4	1.0	35.8	15.2	0.58	1.3
23	18.1	82.8	83.1	51.5	21.8	40.9	48.3	20.5	38.4	19.8	6.0	42.8	18.1	0.88	1.9
24	24.3	88.8	89.1	53.3	22.6	42.3	49.6	21.0	39.4	38.2	16.3	47.5	20.1	1.21	2.7
25	30.8	91.9	92.3	54.9	23.2	43.6	50.7	21.5	40.2	56.3	30.7	50.6	21.4	1.56	3.4
26	37.3	93.7	94.1	56.0	23.7	44.4	51.6	21.9	41.0	67.6	42.4	52.7	22.3	1.93	4.2
27	44.0	94.7	95.1	56.9	24.1	45.2	52.4	22.2	41.6	75.6	52.2	54.1	22.9	2.30	5.1
28	50.6	95.3	95.7	57.7	24.4	45.8	53.1	22.5	42.2	81.5	60.5	55.2	23.4	2.69	5.9
29	57.3	95.6	96.1	58.4	24.7	46.3	53.7	22.7	42.6	85.8	67.3	56.0	23.7	3.08	6.8
30	64.0	95.7	96.2	59.0	25.0	46.8	54.3	23.0	43.1	88.8	72.6	56.7	24.0	3.47	7.7
31	70.7	95.8	96.4	59.5	25.2	47.2	54.8	23.2	43.5	90.9	76.6	57.3	24.2	3.87	8.5
32	77.4	95.8	96.5	59.9	25.3	47.5	55.2	23.4	43.8	92.3	79.5	57.7	24.4	4.27	9.4
33	84.1	95.9	96.6	60.3	25.5	47.8	55.6	23.5	44.1	93.6	82.1	58.2	24.6	4.68	10.3
34	90.8	95.9	96.7	60.6	25.6	48.1	56.0	23.7	44.4	94.4	83.9	58.5	24.8	5.09	11.2
35	97.6	95.9	96.7	60.9	25.8	48.3	56.3	23.8	44.7	95.1	85.6	58.9	24.9	5.49	12.1
36	104.3	95.8	96.7	61.1	25.8	48.5	56.6	24.0	44.9	95.6	86.6	59.0	25.0	5.90	13.0
37	111.0	95.7	96.6	61.3	25.9	48.6	56.9	24.1	45.2	96.0	87.6	59.2	25.0	6.31	13.9
38	117.7	95.5	96.5	61.4	26.0	48.7	57.2	24.2	45.4	96.2	88.1	59.3	25.1	6.72	14.8
39	124.3	95.4	96.4	61.5	26.0	48.8	57.4	24.3	45.5	96.3	88.5	59.3	25.1	7.13	15.7
40	131.0	95.2	96.3	61.7	26.1	48.9	57.6	24.4	45.7	96.7	89.4	59.4	25.1	7.55	16.6
41	137.6	95.1	96.2	61.8	26.2	49.0	57.8	24.5	45.9	96.8	89.8	59.5	25.2	7.96	17.5
42	144.3	94.9	96.1	61.9	26.2	49.1	58.0	24.5	46.0	97.0	90.2	59.5	25.2	8.37	18.4
43	150.9	94.7	96.0	62.0	26.2	49.2	58.2	24.6	46.2	97.1	90.6	59.5	25.2	8.78	19.4
44	157.5	94.5	95.8	62.1	26.3	49.3	58.3	24.7	46.3	97.3	91.0	59.5	25.2	9.19	20.3
45	164.1	94.2	95.6	62.2	26.3	49.4	58.5	24.8	46.4	97.4	91.3	59.5	25.2	9.60	21.2
46	170.7	94.0	95.4	62.3	26.4	49.4	58.6	24.8	46.5	97.5	91.7	59.5	25.2	10.01	22.1
47	177.3	93.7	95.2	62.4	26.4	49.5	58.8	24.9	46.6	97.7	92.0	59.4	25.1	10.42	23.0
48	183.8	93.4	95.0	62.5	26.4	49.6	58.9	24.9	46.8	97.8	92.3	59.4	25.1	10.83	23.9
49	190.3	93.1	94.8	62.5	26.5	49.6	59.0	25.0	46.9	97.8	92.3	59.3	25.1	11.23	24.8
50	196.8	92.8	94.6	62.6	26.5	49.7	59.2	25.0	46.9	97.9	92.7	59.2	25.1	11.64	25.7
51	203.3	92.5	94.4	62.7	26.5	49.8	59.3	25.1	47.0	98.0	93.0	59.2	25.0	12.05	26.6
52	209.7	92.2	94.1	62.7	26.5	49.8	59.4	25.1	47.1	98.0	93.0	59.0	25.0	12.45	27.5
53	216.2	91.9	93.9	62.8	26.6	49.8	59.5	25.2	47.2	98.1	93.2	58.9	24.9	12.86	28.3
54	222.6	91.5	93.6	62.8	26.6	49.9	59.6	25.2	47.3	98.1	93.2	58.8	24.9	13.26	29.2
55	229.0	91.2	93.3	62.9	26.6	49.9	59.7	25.3	47.3	98.2	93.5	58.7	24.8	13.66	30.1
56	235.3	90.9	93.1	62.9	26.6	50.0	59.7	25.3	47.4	98.2	93.5	58.6	24.8	14.06	31.0
57	241.7	90.5	92.8	63.0	26.7	50.0	59.8	25.3	47.5	98.3	93.8	58.5	24.8	14.46	31.9
58	248.0	90.1	92.5	63.0	26.7	50.0	59.9	25.4	47.6	98.3	93.8	58.3	24.7	14.86	32.8
59	254.2	89.7	92.2	63.1	26.7	50.1	60.0	25.4	47.6	98.4	94.1	58.2	24.6	15.25	33.6

Table 21: LOHMANN LSL-LITE Performance Goals (Week 60 – 100)

Age in weeks	Egg No. per H.H. cumul.	Rate of Lay %		Egg weight in week			Egg weight cumulative			% Grade A Large & Above		Egg mass			
		per H.H.	per H.D.	g	Oz./ Doz.	Net. Lbs./ 30 Doz. Case	cumul.	Oz./ Doz.	Net. Lbs./ 30 Doz. Case	23 Oz.	24 Oz.	g/ H.D. in week	Oz./ Doz./ H.D. in week	cumul.	cumul. lbs./ H.H.
60	260.5	89.3	91.9	63.1	26.7	50.1	60.1	25.4	47.7	98.4	94.1	58.0	24.6	15.65	34.5
61	266.7	88.9	91.6	63.2	26.7	50.1	60.1	25.5	47.7	98.5	94.3	57.9	24.5	16.04	35.4
62	272.9	88.5	91.3	63.2	26.8	50.2	60.2	25.5	47.8	98.5	94.3	57.7	24.4	16.43	36.2
63	279.1	88.1	91.0	63.2	26.8	50.2	60.3	25.5	47.8	98.5	94.3	57.5	24.3	16.82	37.1
64	285.2	87.7	90.6	63.2	26.8	50.2	60.3	25.5	47.9	98.5	94.3	57.3	24.3	17.21	37.9
65	291.3	87.3	90.3	63.2	26.8	50.2	60.4	25.6	47.9	98.5	94.3	57.1	24.2	17.60	38.8
66	297.4	86.8	89.9	63.2	26.8	50.2	60.5	25.6	48.0	98.5	94.3	56.9	24.1	17.98	39.6
67	303.5	86.2	89.4	63.2	26.8	50.2	60.5	25.6	48.0	98.5	94.3	56.5	23.9	18.36	40.5
68	309.5	85.7	89.0	63.3	26.8	50.2	60.6	25.6	48.1	98.5	94.6	56.3	23.8	18.74	41.3
69	315.4	85.2	88.6	63.3	26.8	50.2	60.6	25.7	48.1	98.5	94.6	56.0	23.7	19.12	42.2
70	321.4	84.7	88.1	63.3	26.8	50.2	60.7	25.7	48.1	98.5	94.6	55.8	23.6	19.50	43.0
71	327.2	84.2	87.7	63.3	26.8	50.3	60.7	25.7	48.2	98.5	94.6	55.5	23.5	19.87	43.8
72	333.1	83.6	87.2	63.3	26.8	50.3	60.8	25.7	48.2	98.5	94.6	55.2	23.4	20.24	44.6
73	338.9	83.1	86.7	63.4	26.8	50.3	60.8	25.7	48.3	98.6	94.8	55.0	23.3	20.61	45.4
74	344.7	82.5	86.3	63.4	26.8	50.3	60.8	25.8	48.3	98.6	94.8	54.7	23.1	20.97	46.2
75	350.4	81.9	85.8	63.4	26.8	50.3	60.9	25.8	48.3	98.6	94.8	54.4	23.0	21.34	47.0
76	356.1	81.3	85.2	63.4	26.9	50.3	60.9	25.8	48.4	98.6	94.8	54.1	22.9	21.70	47.8
77	361.8	80.7	84.7	63.5	26.9	50.4	61.0	25.8	48.4	98.7	95.0	53.7	22.8	22.06	48.6
78	367.4	80.1	84.2	63.5	26.9	50.4	61.0	25.8	48.4	98.7	95.0	53.4	22.6	22.41	49.4
79	372.9	79.5	83.6	63.5	26.9	50.4	61.0	25.8	48.5	98.7	95.0	53.1	22.5	22.77	50.2
80	378.4	78.8	83.1	63.5	26.9	50.4	61.1	25.9	48.5	98.7	95.0	52.8	22.3	23.12	51.0
81	383.9	78.3	82.6	63.6	26.9	50.4	61.1	25.9	48.5	98.7	95.2	52.5	22.2	23.46	51.7
82	389.4	77.6	82.0	63.6	26.9	50.5	61.2	25.9	48.5	98.7	95.2	52.1	22.1	23.81	52.5
83	394.7	76.9	81.4	63.6	26.9	50.5	61.2	25.9	48.6	98.7	95.2	51.8	21.9	24.15	53.2
84	400.1	76.2	80.8	63.7	26.9	50.5	61.2	25.9	48.6	98.8	95.5	51.4	21.8	24.49	54.0
85	405.4	75.5	80.2	63.7	27.0	50.5	61.3	25.9	48.6	98.8	95.5	51.0	21.6	24.83	54.7
86	410.6	74.8	79.5	63.7	27.0	50.5	61.3	25.9	48.6	98.8	95.5	50.6	21.4	25.16	55.5
87	415.8	74.0	78.8	63.7	27.0	50.6	61.3	26.0	48.7	98.8	95.5	50.2	21.2	25.49	56.2
88	420.9	73.2	78.1	63.8	27.0	50.6	61.3	26.0	48.7	98.9	95.7	49.8	21.1	25.82	56.9
89	426.0	72.6	77.5	63.8	27.0	50.6	61.4	26.0	48.7	98.9	95.7	49.4	20.9	26.14	57.6
90	431.0	71.8	76.8	63.8	27.0	50.6	61.4	26.0	48.7	98.9	95.7	49.0	20.7	26.46	58.3
91	436.0	71.2	76.3	63.8	27.0	50.7	61.4	26.0	48.8	98.9	95.7	48.7	20.6	26.78	59.0
92	440.9	70.4	75.5	63.8	27.0	50.7	61.5	26.0	48.8	98.9	95.7	48.2	20.4	27.10	59.7
93	445.8	69.6	74.8	63.9	27.0	50.7	61.5	26.0	48.8	98.9	95.9	47.8	20.2	27.41	60.4
94	450.6	68.8	74.1	63.9	27.0	50.7	61.5	26.0	48.8	98.9	95.9	47.3	20.0	27.71	61.1
95	455.4	68.0	73.3	64.0	27.1	50.8	61.5	26.0	48.8	99.0	96.0	46.9	19.9	28.02	61.8
96	460.1	67.2	72.6	64.0	27.1	50.8	61.6	26.1	48.9	99.0	96.0	46.4	19.7	28.32	62.4
97	464.7	66.3	71.8	64.0	27.1	50.8	61.6	26.1	48.9	99.0	96.0	46.0	19.5	28.62	63.1
98	469.3	65.4	70.9	64.1	27.1	50.9	61.6	26.1	48.9	99.0	96.2	45.5	19.3	28.91	63.7
99	473.8	64.5	70.1	64.1	27.1	50.9	61.6	26.1	48.9	99.0	96.2	45.0	19.0	29.20	64.4
100	478.3	63.6	69.3	64.1	27.1	50.9	61.7	26.1	48.9	99.0	96.2	44.4	18.8	29.49	65.0

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Table 23: LOHMANN LSL-LITE Expected Egg Grades (%) for different Egg weights* – within Production Weeks (Week 19 – 56)

Week	Egg Weight gram	Egg Weight Net.Lbs./ 30 Doz. Case	< 42 g Pewee < 18 Oz./Doz.	42 g – 50 g Small 18 – 21 Oz./Doz.	50 g – 57 g Medium 18 – 21 Oz./Doz.	57 g – 64 g Large 24 – 27 Oz./Doz.	64 g – 71 g Extra Large 27 – 30 Oz./Doz.	> 71 Jumbo > 30 Oz./Doz.
19	41.2	32.7	61.7	38.2	0.1	0.0	0.0	0.0
20	43.9	34.8	25.3	73.1	1.6	0.0	0.0	0.0
21	46.8	37.1	5.7	79.6	14.7	0.0	0.0	0.0
22	49.2	39.0	1.2	58.7	39.4	0.7	0.0	0.0
23	51.5	40.9	0.2	32.5	62.3	5.0	0.0	0.0
24	53.3	42.3	0.1	17.0	68.6	14.2	0.1	0.0
25	54.9	43.6	0.0	8.5	63.7	27.3	0.5	0.0
26	56.0	44.4	0.0	5.0	55.8	37.8	1.4	0.0
27	56.9	45.2	0.0	3.1	48.0	46.2	2.7	0.0
28	57.7	45.8	0.0	2.0	40.6	52.8	4.6	0.0
29	58.4	46.3	0.0	1.3	34.3	57.4	7.0	0.0
30	59.0	46.8	0.0	0.9	29.2	60.3	9.5	0.1
31	59.5	47.2	0.0	0.7	25.2	61.9	12.1	0.1
32	59.9	47.5	0.0	0.5	22.3	62.6	14.4	0.2
33	60.3	47.8	0.0	0.4	19.6	62.8	16.9	0.3
34	60.6	48.1	0.0	0.4	17.7	62.6	19.0	0.3
35	60.9	48.3	0.0	0.3	15.9	62.1	21.1	0.6
36	61.1	48.5	0.0	0.3	14.8	61.6	22.6	0.7
37	61.3	48.6	0.0	0.2	13.8	61.1	24.2	0.7
38	61.4	48.7	0.0	0.2	13.3	60.8	24.9	0.8
39	61.5	48.8	0.0	0.2	12.8	60.4	25.7	0.9
40	61.7	48.9	0.0	0.2	11.9	59.6	27.3	1.0
41	61.8	49.0	0.0	0.2	11.4	59.2	28.1	1.1
42	61.9	49.1	0.0	0.2	11.0	58.8	28.9	1.1
43	62.0	49.2	0.0	0.1	10.6	58.3	29.7	1.3
44	62.1	49.3	0.0	0.1	10.2	57.8	30.5	1.4
45	62.2	49.4	0.0	0.1	9.8	57.3	31.3	1.5
46	62.3	49.4	0.0	0.1	9.4	56.7	32.1	1.7
47	62.4	49.5	0.0	0.1	9.0	56.2	33.0	1.7
48	62.5	49.6	0.0	0.1	8.7	55.6	33.8	1.8
49	62.5	49.6	0.0	0.1	8.7	55.6	33.8	1.8
50	62.6	49.7	0.0	0.1	8.3	55.0	34.6	2.0
51	62.7	49.8	0.0	0.1	8.0	54.4	35.4	2.1
52	62.7	49.8	0.0	0.1	8.0	54.4	35.4	2.1
53	62.8	49.8	0.0	0.1	7.7	53.8	36.2	2.2
54	62.8	49.9	0.0	0.1	7.7	53.8	36.2	2.2
55	62.9	49.9	0.0	0.1	7.4	53.2	37.0	2.3
56	62.9	50.0	0.0	0.1	7.4	53.2	37.0	2.3
57	63.0	50.0	0.0	0.1	7.1	52.5	37.8	2.5
58	63.0	50.0	0.0	0.1	7.1	52.5	37.8	2.5
59	63.1	50.1	0.0	0.1	6.8	51.8	38.6	2.7

*excluding double-yolk eggs

Table 23: LOHMANN LSL-LITE Expected Egg Grades (%) for different Egg weights* – within Production Weeks (Week 57 – 95)

Week	Egg Weight gram	Egg Weight Net.Lbs./ 30 Doz. Case	<42 g Pewee < 18 Oz./Doz.	42 g – 50 g Small 18 – 21 Oz./Doz.	50 g – 57 g Medium 18 – 21 Oz./Doz	57 g – 64 g Large 24 – 27 Oz./Doz	64 g – 71 g Extra Large 27 – 30 Oz./Doz	>71 Jumbo > 30 Oz./Doz
60	63.1	0.0	0.1	6.8	51.8	38.6	2.7	5.8
61	63.2	0.0	0.1	6.5	51.2	39.4	2.8	5.8
62	63.2	0.0	0.1	6.5	51.2	39.4	2.8	6.0
63	63.2	0.0	0.1	6.5	51.2	39.4	2.8	6.0
64	63.2	0.0	0.1	6.5	51.2	39.4	2.8	6.4
65	63.2	0.0	0.1	6.5	51.2	39.4	2.8	6.4
66	63.2	0.0	0.1	6.5	51.2	39.4	2.8	6.4
67	63.2	0.0	0.1	6.5	51.2	39.4	2.8	6.8
68	63.3	0.0	0.1	6.2	50.5	40.2	3.0	6.8
69	63.3	0.0	0.1	6.2	50.5	40.2	3.0	7.0
70	63.3	0.0	0.1	6.2	50.5	40.2	3.0	7.0
71	63.3	0.0	0.1	6.2	50.5	40.2	3.0	7.0
72	63.3	0.0	0.1	6.2	50.5	40.2	3.0	7.5
73	63.4	0.0	0.1	6.0	49.8	41.0	3.1	7.5
74	63.4	0.0	0.1	6.0	49.8	41.0	3.1	7.8
75	63.4	0.0	0.1	6.0	49.8	41.0	3.1	7.8
76	63.4	0.0	0.1	6.0	49.8	41.0	3.1	7.8
77	63.5	0.0	0.1	5.7	49.1	41.7	3.4	7.8
78	63.5	0.0	0.1	5.7	49.1	41.7	3.4	8.1
79	63.5	0.0	0.1	5.7	49.1	41.7	3.4	8.1
80	63.5	0.0	0.1	5.7	49.1	41.7	3.4	8.1
81	63.6	0.0	0.1	5.5	48.3	42.5	3.6	8.6
82	63.6	0.0	0.1	5.5	48.3	42.5	3.6	8.6
83	63.6	0.0	0.1	5.5	48.3	42.5	3.6	8.6
84	63.7	0.0	0.0	5.2	47.6	43.2	4.0	8.6
85	63.7	0.0	0.0	5.2	47.6	43.2	4.0	9.0
86	63.7	0.0	0.0	5.2	47.6	43.2	4.0	9.0
87	63.7	0.0	0.0	5.2	47.6	43.2	4.0	9.0
88	63.8	0.0	0.0	5.0	46.9	44.0	4.1	9.0
89	63.8	0.0	0.0	5.0	46.9	44.0	4.1	9.0
90	63.8	0.0	0.0	5.0	46.9	44.0	4.1	9.4
91	63.8	0.0	0.0	5.0	46.9	44.0	4.1	9.4
92	63.8	0.0	0.0	5.0	46.9	44.0	4.1	9.4
93	63.9	0.0	0.0	4.8	46.1	44.7	4.4	9.4
94	63.9	0.0	0.0	4.8	46.1	44.7	4.4	9.4
95	64.0	0.0	0.0	4.6	45.4	45.4	4.6	9.4
96	64.0	0.0	0.0	4.6	45.4	45.4	4.6	9.9
97	64.0	0.0	0.0	4.6	45.4	45.4	4.6	9.9
98	64.1	0.0	0.0	4.4	44.6	46.1	4.9	9.9
99	64.1	0.0	0.0	4.4	44.6	46.1	4.9	9.9
100	64.1	0.0	0.0	4.4	44.6	46.1	4.9	9.9

*excluding double-yolk eggs

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Table 24: LOHMANN LSL-LITE Expected Egg Grades (%) for different Egg weights* – cumulative over Production Period (Week 19 – 56)

Week	Egg Weight gram	Egg Weight Net.Lbs./ 30 Doz. Case	< 42 g Pewee < 18 Oz./Doz.	42 g – 50 g Small 18 – 21 Oz./Doz.	50 g – 57 g Medium 18 – 21 Oz./Doz	57 g – 64 g Large 24 – 27 Oz./Doz	64 g – 71 g Extra Large 27 – 30 Oz./Doz	> 71 Jumbo > 30 Oz./Doz
19	41.2	32.7	61.7	38.2	0.1	0.0	0.0	0.0
20	43.3	34.4	33.0	65.7	1.3	0.0	0.0	0.0
21	45.2	35.9	18.3	73.1	8.5	0.0	0.1	0.0
22	46.8	37.2	11.2	67.3	21.2	0.3	0.0	0.0
23	48.3	38.4	7.7	56.1	34.4	1.8	0.0	0.0
24	49.6	39.4	5.8	46.1	43.1	5.0	0.0	0.0
25	50.7	40.2	4.6	38.3	47.4	9.6	0.1	0.0
26	51.6	41.0	3.8	32.3	48.9	14.6	0.4	0.0
27	52.4	41.6	3.2	27.9	48.8	19.4	0.7	0.0
28	53.1	42.2	2.8	24.5	47.7	23.8	1.2	0.0
29	53.7	42.6	2.4	21.9	46.1	27.7	1.9	0.0
30	54.3	43.1	2.2	19.6	44.4	31.1	2.7	0.0
31	54.8	43.5	2.0	17.9	42.5	34.0	3.6	0.0
32	55.2	43.8	1.8	16.4	40.8	36.5	4.5	0.0
33	55.6	44.1	1.7	15.0	39.1	38.6	5.5	0.1
34	56.0	44.4	1.5	14.0	37.5	40.4	6.5	0.1
35	56.3	44.7	1.4	13.1	36.0	41.9	7.5	0.1
36	56.6	44.9	1.3	12.3	34.7	43.1	8.5	0.1
37	56.9	45.2	1.3	11.5	33.4	44.2	9.4	0.2
38	57.2	45.4	1.2	10.8	32.3	45.2	10.3	0.2
39	57.4	45.5	1.1	10.3	31.2	46.0	11.1	0.3
40	57.6	45.7	1.1	9.7	30.2	46.7	12.0	0.3
41	57.8	45.9	1.0	9.4	29.3	47.3	12.7	0.3
42	58.0	46.0	1.0	8.8	28.5	47.8	13.5	0.4
43	58.2	46.2	0.9	8.5	27.7	48.3	14.2	0.4
44	58.3	46.3	0.9	8.1	27.0	48.7	14.9	0.4
45	58.5	46.4	0.9	7.8	26.3	49.0	15.5	0.5
46	58.6	46.5	0.8	7.6	25.6	49.3	16.2	0.5
47	58.8	46.6	0.8	7.2	25.0	49.6	16.8	0.6
48	58.9	46.8	0.8	7.0	24.4	49.8	17.4	0.6
49	59.0	46.9	0.7	6.7	23.9	50.0	18.0	0.7
50	59.2	46.9	0.7	6.6	23.4	50.1	18.5	0.7
51	59.3	47.0	0.7	6.2	22.9	50.3	19.1	0.8
52	59.4	47.1	0.7	6.1	22.4	50.4	19.6	0.8
53	59.5	47.2	0.6	6.0	22.0	50.5	20.1	0.8
54	59.6	47.3	0.6	5.8	21.6	50.6	20.5	0.9
55	59.7	47.3	0.6	5.6	21.2	50.7	21.0	0.9
56	59.7	47.4	0.6	5.5	20.8	50.7	21.4	1.0
57	59.8	47.5	0.6	5.4	20.4	50.8	21.8	1.0
58	59.9	47.6	0.6	5.3	20.1	50.8	22.2	1.0
59	60.0	47.6	0.6	5.0	19.8	50.9	22.6	1.1

*excluding double-yolk eggs

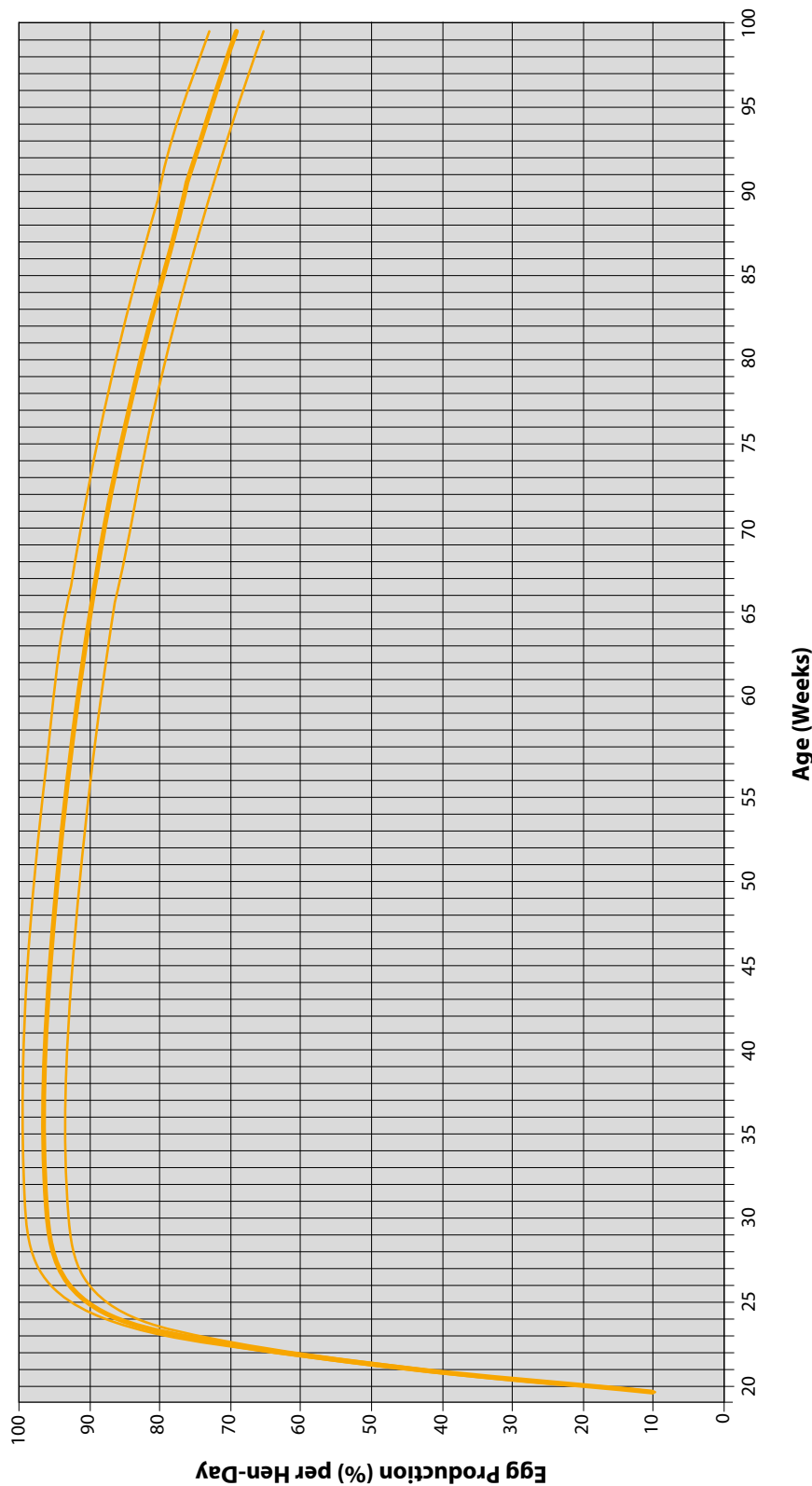
Table 24: LOHMANN LSL-LITE Expected Egg Grades (%) for different Egg weights* – cumulative over Production Period (Week 57 – 95)

Week	Egg Weight gram	Egg Weight Net.Lbs./ 30 Doz. Case	<42 g Pewee < 18 Oz./Doz.	42 g – 50 g Small 18 – 21 Oz./Doz.	50 g – 57 g Medium 18 – 21 Oz./Doz.	57 g – 64 g Large 24 – 27 Oz./Doz.	64 g – 71 g Extra Large 27 – 30 Oz./Doz.	>71 Jumbo > 30 Oz./Doz.
60	60.1	47.7	0.5	5.0	19.5	50.9	23.0	1.1
61	60.1	47.7	0.5	4.8	19.2	50.9	23.4	1.2
62	60.2	47.8	0.5	4.7	18.9	50.9	23.8	1.2
63	60.3	47.8	0.5	4.7	18.6	50.9	24.1	1.2
64	60.3	47.9	0.5	4.5	18.3	50.9	24.5	1.3
65	60.4	47.9	0.5	4.4	18.1	50.9	24.8	1.3
66	60.5	48.0	0.5	4.3	17.9	50.9	25.1	1.3
67	60.5	48.0	0.5	4.3	17.6	50.9	25.3	1.4
68	60.6	48.1	0.5	4.2	17.4	50.9	25.6	1.4
69	60.6	48.1	0.4	4.2	17.2	50.9	25.9	1.4
70	60.7	48.1	0.4	4.1	17.0	50.9	26.2	1.4
71	60.7	48.2	0.4	4.0	16.8	50.9	26.4	1.5
72	60.8	48.2	0.4	3.9	16.6	50.9	26.7	1.5
73	60.8	48.3	0.4	3.9	16.4	50.9	26.9	1.5
74	60.8	48.3	0.4	3.6	16.3	50.9	27.2	1.6
75	60.9	48.3	0.4	3.7	16.1	50.8	27.4	1.6
76	60.9	48.4	0.4	3.7	15.9	50.8	27.6	1.6
77	61.0	48.4	0.4	3.6	15.8	50.8	27.8	1.6
78	61.0	48.4	0.4	3.5	15.6	50.8	28.0	1.7
79	61.0	48.5	0.4	3.5	15.5	50.7	28.2	1.7
80	61.1	48.5	0.4	3.5	15.3	50.7	28.4	1.7
81	61.1	48.5	0.4	3.4	15.2	50.7	28.6	1.7
82	61.2	48.5	0.4	3.4	15.0	50.6	28.8	1.8
83	61.2	48.6	0.4	3.3	14.9	50.6	29.0	1.8
84	61.2	48.6	0.4	3.2	14.8	50.6	29.2	1.8
85	61.3	48.6	0.3	3.3	14.7	50.5	29.4	1.8
86	61.3	48.6	0.3	3.2	14.5	50.5	29.6	1.9
87	61.3	48.7	0.3	3.2	14.4	50.5	29.7	1.9
88	61.3	48.7	0.3	3.2	14.3	50.4	29.9	1.9
89	61.4	48.7	0.3	3.1	14.2	50.4	30.1	1.9
90	61.4	48.7	0.3	3.1	14.1	50.3	30.2	2.0
91	61.4	48.8	0.3	3.0	14.0	50.3	30.4	2.0
92	61.5	48.8	0.3	3.0	13.9	50.3	30.5	2.0
93	61.5	48.8	0.3	3.0	13.8	50.2	30.7	2.0
94	61.5	48.8	0.3	2.9	13.7	50.2	30.8	2.1
95	61.5	48.8	0.3	2.9	13.6	50.1	31.0	2.1
96	61.6	48.9	0.3	2.9	13.5	50.1	31.1	2.1
97	61.6	48.9	0.3	2.8	13.4	50.0	31.3	2.2
98	61.6	48.9	0.3	2.8	13.3	50.0	31.4	2.2
99	61.6	48.9	0.3	2.8	13.2	49.9	31.6	2.2
100	61.7	48.9	0.3	2.7	13.2	49.9	31.7	2.2

*excluding double-yolk eggs

GERNERAL INFORMATION

Egg Production Curve for LOHMANN LSL-LITE Layers



NOTES

INFORMATION

HOW LOHMANN IS CALCULATING THE ENERGY CONTENT OF FEED AND RAW MATERIALS (INTERNATIONAL WPSA-FORMULA):

$$\begin{aligned} \text{ME MJ/kg} = & \text{g crude protein} \times 0.01551 \\ & + \text{g crude fat} \times 0.03431 \\ & + \text{g starch} \times 0.01669 \\ & + \text{g sugar} \times 0.01301 \text{ (as saccharose)} \end{aligned}$$

ME = metabolizable energy in MJ/kg
1 kcal = 4.187 kJ

DISCLAIMER

The information, advices and suggestions given in this management guide should be used for guidance and educational purposes only, recognizing 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, LOHMANN cannot accept responsibility for any errors, omissions or inaccuracies in such information or management suggestions. Further, LOHMANN 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,

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