LOHMANN BROWN-LITE

Layers

MANAGEMENT GUIDE

CAGE HOUSING

North American Edition

BREEDING FOR SUCCESS … TOGETHER

LOHMANN TIERZUCHT

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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 TIERZUCHT – 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 TIERZUCHT 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.

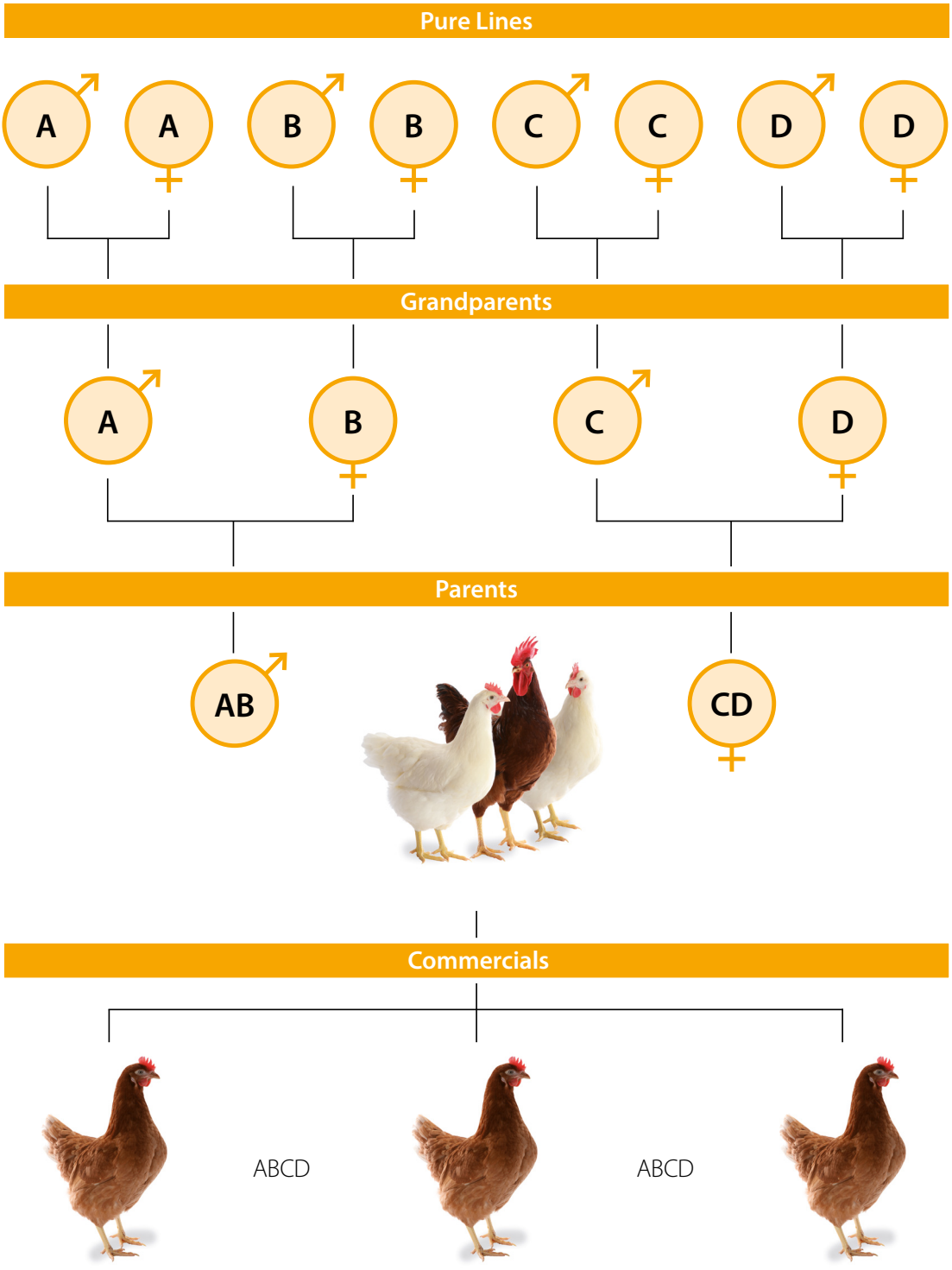
Moreover, nationally and internationally, LOHMANN TIERZUCHT is ranked as first class for questions on poultry health, which is one of the decisive factors for performance and profitability.

Intensive research in our own Veterinary Laboratory, besides increasing resistance to diseases by genetic means and ensuring the strictest conditions of hygiene, is fundamental to the quality of LOHMANN TIERZUCHT products.
In addition, LOHMANN TIERZUCHT 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 TIERZUCHT 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 TIERZUCHT products are often the winners and are always among the few at the top, worldwide.

BREEDING SCHEME



PERFORMANCE DATA

LOHMANN BROWN-LITE Layer

Egg Production	Age at 50 % production	140–150 days	
	Peak production	94–96 %	
	Eggs per Hen Housed		
	in 60 Weeks of age	254–258	256
	in 72 Weeks of age	322–326	324
	in 80 Weeks of age	363–369	366
	in 95 Weeks of age	434–440	437
	Eggs Mass per Hen Housed		
	in 60 Weeks of age	15.6–15.8 kg (34.3–34.7 lbs.)	15.7 kg (34.6 lbs.)
	in 72 Weeks of age	19.9–20.3 kg (43.8–44.7 lbs.)	20.1 kg (44.3 lbs.)
	in 80 Weeks of age	22.7–23.1 kg (50.0–50.8 lbs.)	22.9 kg (50.4 lbs.)
	in 95 Weeks of age	27.4–27.8 kg (60.4–61.2 lbs.)	27.6 kg (60.8 lbs.)
	Average Egg Weight		
	in 60 Weeks of age	60.9–61.3 g (25.8–25.9 Oz./Doz.)	61.1 g (25.9 Oz./Doz.)
	in 72 Weeks of age	61.8–62.2 g (26.1–26.3 Oz./Doz.)	62.0 g (26.2 Oz./Doz.)
	in 80 Weeks of age	62.1–62.7 g (26.3–26.5 Oz./Doz.)	62.4 g (26.4 Oz./Doz.)
	in 95 Weeks of age	62.8–63.4 g (26.6–26.8 Oz./Doz.)	63.1 g (26.7 Oz./Doz.)
Egg Characteristics	Shell colour	attractive brown	
	Shell breaking strength	> 40 Newton	
Feed Consumption	1st–20th week	7.0–7.4 kg (15.4–16.3 lbs.)	
	Production	105–112 g/day (23.1–24.7 lbs./100/day)	
	Feed conversion	2.0–2.1 kg/kg egg mass or lbs./lbs. egg mass	
Body Weight	at 20 weeks	1.55–1.65 kg (3.42–3.64 lbs.)	
	at the end of production	1.90–2.10 kg (4.19–4.63 lbs.)	
Liveability	Rearing	97–98 %	
	Laying period	92–94 %	
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).

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.
- 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.

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	334	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_2S	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 adversly 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 Veterinary Laboratory 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 BROWN-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*
SP: *Spray*
ED: *Eye Drop*
WW: *Wing Web*
IM: *Intramuscular Injection*
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 exces-sive 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 BROWN-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.

NUTRITION

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.

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.

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 TIERZUCHT.

** Non-Starch Polysaccharides*
*** Dried Distillers Grains with Solubles*

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*

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 to 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.

NUTRITION

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

Age in Weeks	Body Weight				Feed Consumption***								Feed*
	average lbs.	range in lbs.	average g	range in g	kJ**/ bird Day	kJ/ bird cumul.	kcal/ bird day	kcal/ bird cumul.	lbs./ 100/ day	lbs. cumul.	g/ bird/ day	g/ bird/ cumul.	
1	0.17	0.16–0.17	75	72–78	132	924	32	221	2.43	0.17	11	77	Grower/Starter
2	0.28	0.26–0.29	125	120–130	204	2352	49	562	3.75	0.43	17	196	
3	0.42	0.40–0.44	190	182–198	264	4200	63	1004	4.85	0.77	22	350	
4	0.60	0.57–0.62	270	259–281	330	6513	79	1557	6.17	1.20	28	546	
5	0.79	0.76–0.82	360	346–374	389	9239	93	2208	7.28	1.71	33	777	
6	1.02	0.98–1.06	462	444–480	448	12377	107	2958	8.38	2.30	38	1043	
7	1.25	1.19–1.30	565	542–588	496	15847	118	3787	9.26	2.95	42	1337	
8	1.47	1.41–1.53	665	638–692	543	19646	130	4696	10.14	3.66	46	1659	
9	1.68	1.61–1.74	760	730–790	578	23694	138	5663	10.80	4.41	49	2002	Developer
10	1.87	1.80–1.95	850	816–884	614	27989	147	6689	11.46	5.22	52	2366	
11	2.06	1.98–2.14	935	898–972	649	32532	155	7775	12.13	6.06	55	2751	
12	2.24	2.15–2.33	1015	974–1056	684	37323	164	8920	12.79	6.96	58	3157	
13	2.41	2.31–2.51	1093	1049–1137	720	42361	172	10125	13.45	7.90	61	3584	
14	2.57	2.47–2.67	1166	1119–1213	755	47648	180	11388	14.11	8.89	64	4032	
15	2.71	2.61–2.82	1231	1182–1280	791	53182	189	12711	14.77	9.92	67	4501	
16	2.86	2.74–2.97	1296	1244–1348	826	58964	197	14093	15.43	11.00	70	4991	
17	3.01	2.89–3.13	1364	1309–1419	861	64994	206	15534	16.09	12.13	73	5502	Pre-Layer
18	3.17	3.04–3.30	1438	1380–1496	909	71354	217	17054	16.98	13.32	77	6041	
19	3.34	3.21–3.48	1516	1455–1577	956	78044	228	18653	17.86	14.57	81	6608	Pre-Peak
20	3.52	3.38–3.66	1596	1532–1660	1015	85148	243	20351	18.96	15.90	86	7210	

* *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 BROWN-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	75	72–78	82	89	96	104	111	118
2	125	120–130	134	144	153	162	171	181
3	190	182–198	201	213	224	236	247	259
4	270	259–281	283	296	309	321	334	347
5	360	346–374	375	389	404	418	433	447
6	462	444–480	477	491	506	521	536	550
7	565	542–588	579	594	608	622	636	651
8	665	638–692	679	692	706	719	733	746
9	760	730–790	773	786	799	811	824	837
10	850	816–884	862	874	886	899	911	923
11	935	898–972	946	958	969	981	992	1004
12	1015	974–1056	1026	1037	1048	1060	1071	1082
13	1093	1049–1137	1103	1114	1124	1135	1145	1156
14	1166	1119–1213	1175	1185	1194	1203	1212	1222
15	1231	1182–1280	1240	1250	1259	1268	1277	1287
16	1296	1244–1348	1306	1315	1325	1335	1345	1354
17	1364	1309–1419	1375	1385	1396	1406	1417	1427
18	1438	1380–1496	1449	1460	1471	1483	1494	1505
19	1516	1455–1577	1527	1539	1550	1562	1573	1585
20	1596	1532–1660	1606	1617	1627	1637	1647	1658

NUTRITION

Table 7: Recommendations for Nutrient Levels for LOHMANN BROWN-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
Tryptophan	%	0.23	0.21	0.16	0.20
Dig. Tryptophan	%	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.*

Laying Period

LOHMANN BROWN-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 – 110 g (22.0 – 24.0 lbs./100/day) per LOHMANN BROWN-LITE hen can be expected.

Table 8: Recommended Nutrient Levels for LOHMANN BROWN-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	%	19.47	18.50	17.62	16.82
Calcium**	%	4.00	3.80	3.62	3.45
Phosphorus***	%	0.68	0.64	0.61	0.58
Av. Phosphorus	%	0.47	0.45	0.43	0.41
Sodium	%	0.19	0.18	0.17	0.16
Chlorine	%	0.19	0.18	0.17	0.16
Lysine	%	0.89	0.84	0.80	0.76
Dig. Lysine	%	0.73	0.69	0.66	0.63
Methionine	%	0.44	0.41	0.39	0.38
Dig. Methionine	%	0.36	0.34	0.32	0.31
Meth./Cyst.	%	0.80	0.76	0.72	0.69
Dig. M/C	%	0.65	0.62	0.59	0.56
Arginine	%	0.91	0.87	0.82	0.79
Dig. Arginine	%	0.75	0.71	0.68	0.65
Valine	%	0.74	0.71	0.67	0.64
Dig. Valine	%	0.63	0.60	0.57	0.55
Tryptophan	%	0.19	0.18	0.17	0.17
Dig. Tryptophan	%	0.16	0.15	0.14	0.14
Threonine	%	0.62	0.59	0.56	0.53
Dig. Threonine	%	0.51	0.48	0.46	0.44
Isoleucine	%	0.71	0.67	0.64	0.61
Dig. Isoleucine	%	0.58	0.55	0.52	0.50
Linoleic Acid	%	2.32	2.20	2.10	2.00

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

(approx. 50 % Production to 40 weeks)*

Nutrient		Daily Feed Consumption /Hen			
		100 g** (22.0 lbs./100 birds)	105 g (23.2 lbs./100 birds)	110 g (24.3 lbs./100 birds)	115 g (25.3 lbs./100 birds)
Protein	%	18.13	17.27	16.48	15.77
Calcium***	%	4.10	3.90	3.73	3.57
Phosphorus****	%	0.63	0.60	0.57	0.55
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	0.79	0.75	0.72
Dig. Lysine	%	0.68	0.64	0.61	0.59
Methionine	%	0.41	0.39	0.37	0.35
Dig. Methionine	%	0.33	0.32	0.30	0.29
Meth./Cyst.	%	0.74	0.71	0.67	0.64
Dig. M/C	%	0.61	0.58	0.55	0.53
Arginine	%	0.85	0.81	0.77	0.74
Dig. Arginine	%	0.70	0.66	0.63	0.61
Valine	%	0.69	0.66	0.63	0.60
Dig. Valine	%	0.59	0.56	0.53	0.51
Tryptophan	%	0.18	0.17	0.16	0.16
Dig. Tryptophan	%	0.15	0.14	0.13	0.13
Threonine	%	0.57	0.55	0.52	0.50
Dig. Threonine	%	0.47	0.45	0.43	0.41
Isoleucine	%	0.66	0.63	0.60	0.57
Dig. Isoleucine	%	0.54	0.51	0.49	0.47
Linoleic Acid	%	2.20	2.10	2.00	1.91

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

(approx. 41 to 50 weeks)*

Nutrient		Daily Feed Consumption /Hen			
		100 g** (22.0 lbs./100 birds)	105 g (23.2 lbs./100 birds)	110 g (24.3 lbs./100 birds)	115 g (25.3 lbs./100 birds)
Protein	%	17.76	16.91	16.15	15.44
Calcium***	%	4.20	4.00	3.82	3.65
Phosphorus****	%	0.62	0.59	0.56	0.54
Av. Phosphorus	%	0.43	0.41	0.39	0.38
Sodium	%	0.17	0.16	0.16	0.15
Chlorine	%	0.17	0.16	0.16	0.15
Lysine	%	0.81	0.77	0.73	0.70
Dig. Lysine	%	0.66	0.63	0.60	0.58
Methionine	%	0.40	0.38	0.36	0.35
Dig. Methionine	%	0.33	0.31	0.30	0.28
Meth./Cyst.	%	0.73	0.69	0.66	0.63
Dig. M/C	%	0.60	0.57	0.54	0.52
Arginine	%	0.83	0.79	0.76	0.72
Dig. Arginine	%	0.68	0.65	0.62	0.59
Valine	%	0.68	0.65	0.62	0.59
Dig. Valine	%	0.58	0.55	0.52	0.50
Tryptophan	%	0.18	0.17	0.16	0.15
Dig. Tryptophan	%	0.14	0.14	0.13	0.13
Threonine	%	0.56	0.54	0.51	0.49
Dig. Threonine	%	0.46	0.44	0.42	0.40
Isoleucine	%	0.64	0.61	0.59	0.56
Dig. Isoleucine	%	0.53	0.50	0.48	0.46
Linoleic Acid	%	1.60	1.52	1.45	1.39

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

(approx. 51 to 65 weeks)*

Nutrient		Daily Feed Consumption /Hen			
		100 g** (22.0 lbs./100 birds)	105 g (23.2 lbs./100 birds)	110 g (24.3 lbs./100 birds)	115 g (25.3 lbs./100 birds)
Protein	%	17.21	16.39	15.64	14.96
Calcium***	%	4.30	4.10	3.91	3.74
Phosphorus****	%	0.60	0.57	0.54	0.52
Av. Phosphorus	%	0.42	0.40	0.38	0.36
Sodium	%	0.17	0.16	0.15	0.15
Chlorine	%	0.17	0.16	0.15	0.15
Lysine	%	0.78	0.75	0.71	0.68
Dig. Lysine	%	0.64	0.61	0.58	0.56
Methionine	%	0.39	0.37	0.35	0.34
Dig. Methionine	%	0.32	0.30	0.29	0.27
Meth./Cyst.	%	0.70	0.67	0.64	0.61
Dig. M/C	%	0.58	0.55	0.52	0.50
Arginine	%	0.81	0.77	0.73	0.70
Dig. Arginine	%	0.66	0.63	0.60	0.57
Valine	%	0.66	0.63	0.60	0.57
Dig. Valine	%	0.56	0.53	0.51	0.49
Tryptophan	%	0.17	0.16	0.15	0.15
Dig. Tryptophan	%	0.14	0.13	0.13	0.12
Threonine	%	0.54	0.52	0.49	0.47
Dig. Threonine	%	0.45	0.43	0.41	0.39
Isoleucine	%	0.62	0.59	0.57	0.54
Dig. Isoleucine	%	0.51	0.49	0.47	0.44
Linoleic Acid	%	1.40	1.33	1.27	1.22

* *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*

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

(approx. after week 65)

Nutrient		Daily Feed Consumption /Hen			
		100 g* (22.0 lbs./100 birds)	**105 g** (23.2 lbs./100 birds)	**110 g** (24.3 lbs./100 birds)	**115 g** (25.3 lbs./100 birds)
Protein	%	16.65	15.86	15.14	14.48
Calcium **	%	4.50	4.29	4.09	3.91
Phosphorus ***	%	0.58	0.55	0.53	0.50
Av. Phosphorus	%	0.41	0.39	0.37	0.35
Sodium	%	0.16	0.15	0.15	0.14
Chlorine	%	0.16	0.15	0.15	0.14
Lysine	%	0.76	0.72	0.69	0.66
Dig. Lysine	%	0.62	0.59	0.56	0.54
Methionine	%	0.37	0.36	0.34	0.32
Dig. Methionine	%	0.31	0.29	0.28	0.27
Meth./Cyst.	%	0.68	0.65	0.62	0.59
Dig. M/C	%	0.56	0.53	0.51	0.49
Arginine	%	0.78	0.74	0.71	0.68
Dig. Arginine	%	0.64	0.61	0.58	0.56
Valine	%	0.64	0.61	0.58	0.55
Dig. Valine	%	0.54	0.51	0.49	0.47
Tryptophan	%	0.16	0.16	0.15	0.14
Dig. Tryptophan	%	0.14	0.13	0.12	0.12
Threonine	%	0.53	0.50	0.48	0.46
Dig. Threonine	%	0.43	0.41	0.39	0.38
Isoleucine	%	0.60	0.57	0.55	0.52
Dig. Isoleucine	%	0.50	0.47	0.45	0.43
Linoleic Acid	%	1.20	1.14	1.09	1.04

** 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

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 an egg weight.

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

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 synthezised by poultry normally and is not considerd 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

** 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*

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 tailormade 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:

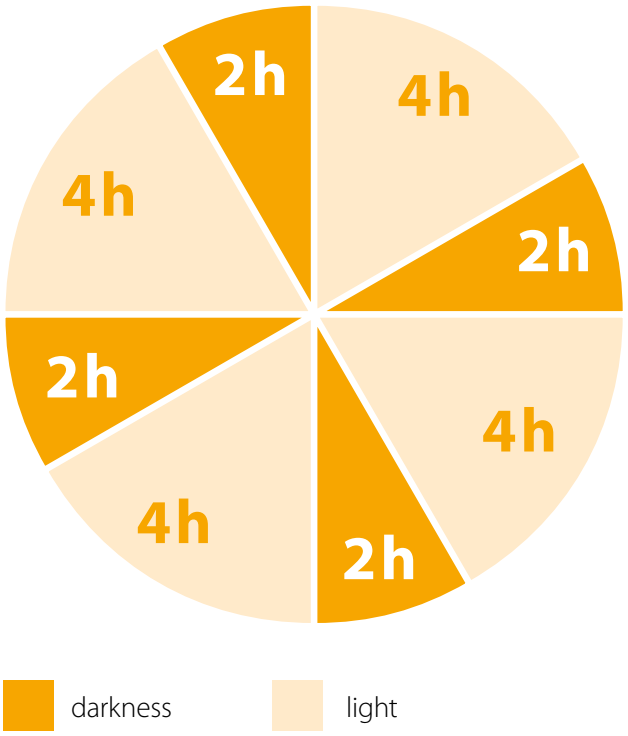
- **Never increase hours of light during the rearing period.**
- **Never decrease hours of light during the production period**
- **Always keep in mind that artificial and natural daylight can have an influence in open or brown-out houses.**

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 TIERZUCHT 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 BROWN-LITE Pullets/Layers

Age (Weeks)	Hours of Light	Light Intensity (Lux)	
	(Standard)	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	0.5 – 1	5 – 10
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	10	0.4 – 0.6	4 – 6
8	10	0.4 – 0.6	4 – 6
9	10	0.4 – 0.6	4 – 6
10	10	0.4 – 0.6	4 – 6
11	10	0.4 – 0.6	4 – 6
12	10	0.4 – 0.6	4 – 6
13	10	0.4 – 0.6	4 – 6
14	10	0.4 – 0.6	4 – 6
15	10	0.4 – 0.6	4 – 6
16	10	0.4 – 0.6	4 – 6
17	10	0.4 – 0.6	4 – 6
18	12	1 – 1.5	10 – 15
19	13	1 – 1.5	10 – 15
20	14	1 – 1.5	10 – 15
21	15	1 – 1.5	10 – 15
22	16	1 – 1.5	10 – 15
23	16	1 – 1.5	10 – 15
24	16	1 – 1.5	10 – 15
25	16	1 – 1.5	10 – 15
26	16	1 – 1.5	10 – 15
27	16	1 – 1.5	10 – 15
28	16	1 – 1.5	10 – 15
29	16	1 – 1.5	10 – 15
30**	16	1 – 1.5	10 – 15

** 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

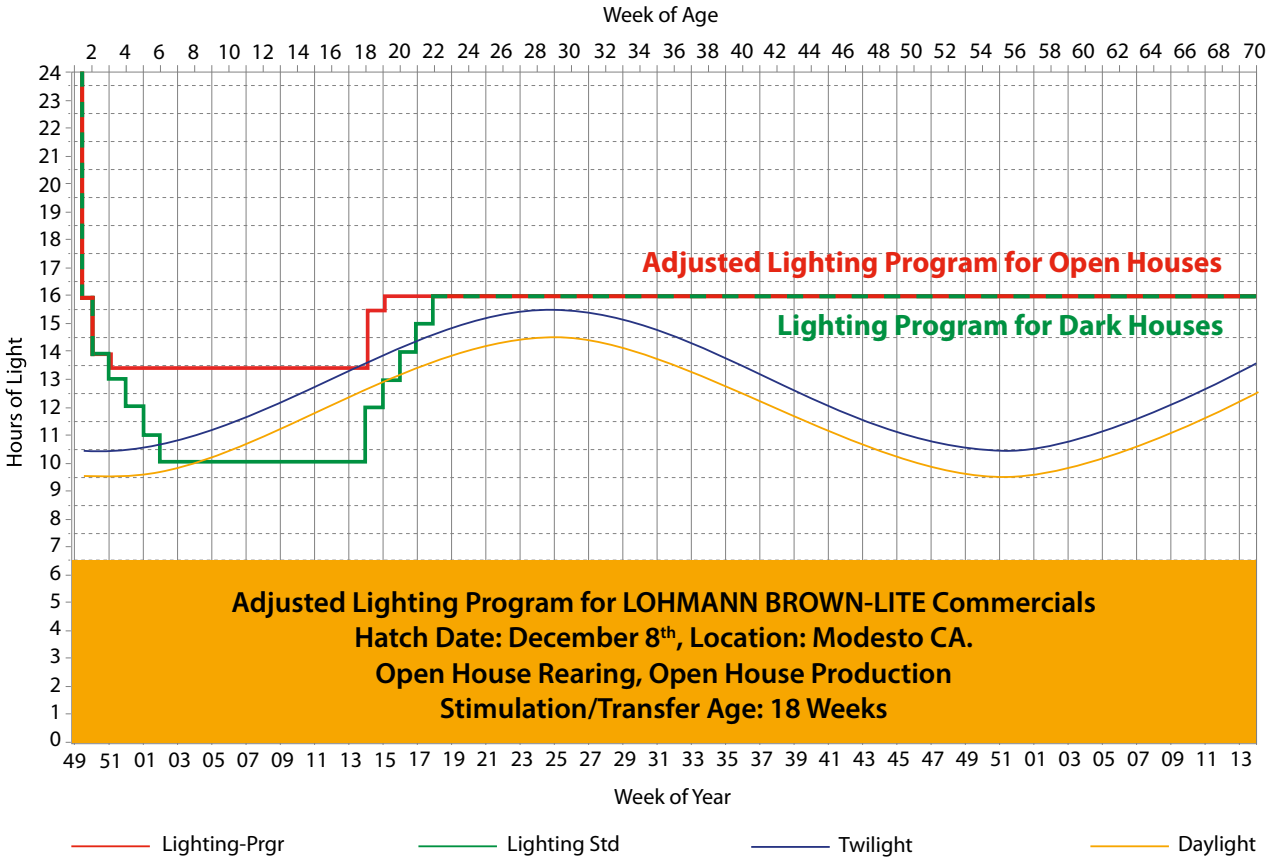
The lighting program and the step down procedure have to be adjusted to the longest length of day to which the birds are exposed to in the period from 3 to 17 weeks of age. Birds which are hatched in the first days of April and are reared at 20° N. Latitude, will be exposed to a 13-hour day length up 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 BROWN-LITE Layers adjusted to location, condition and requirements by LOHMANN TIERZUCHT 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 BROWN-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

Age / Equipment		Cage Rearing		Floor Rearing	
		0 – 4 weeks	5 –17 weeeks	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) trough (in/bird) pan (birds/pan)	2.5 1 24	5 2 12	4 1.5 60	8 3 30
Water Space	birds/cup birds/nipple birds/fountain trough (cm/bird) trough (in/bird)	16 16 50 (mini) 1.25 0.5	8 8 – 2.5 1	50 20 150 1.25 0.5	25 10 75 2.5 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 optimal bird density depends on management conditions and to which extent climate can be controlled. 6 – 8 birds/m^2 can be taken as a general guide for barn systems.

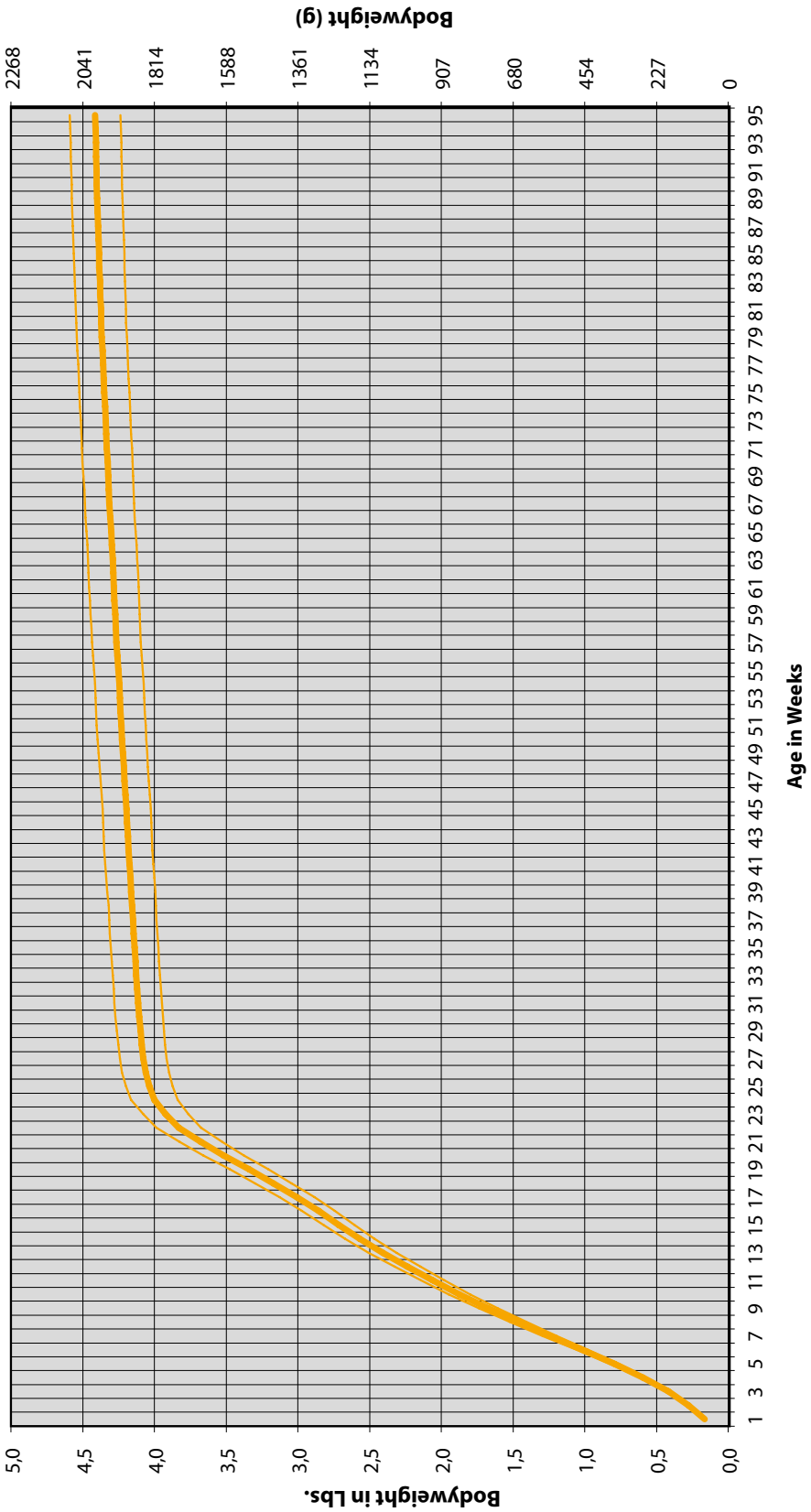
GERNERAL INFORMATION

Table 20: Body Weight Development of LOHMANN BROWN-LITE

Week 1 – 95

Age in Weeks	Weight Range (g)	
	lbs.	gram
1	0.16–0.17	72–78
2	0.26–0.29	120–130
3	0.40–0.44	182–198
4	0.57–0.62	259–281
5	0.76–0.82	346–374
6	0.98–1.06	444–480
7	1.19–1.30	542–588
8	1.41–1.53	638–692
9	1.61–1.74	730–790
10	1.80–1.95	816–884
11	1.98–2.14	898–972
12	2.15–2.33	974–1056
13	2.31–2.51	1049–1137
14	2.47–2.67	1119–1213
15	2.61–2.82	1182–1280
16	2.74–2.97	1244–1348
17	2.89–3.13	1309–1419
18	3.04–3.30	1380–1496
19	3.21–3.48	1455–1577
20	3.38–3.66	1532–1660
21	3.53–3.83	1601–1735
22	3.68–3.99	1668–1808
23	3.77–4.08	1708–1850
24	3.84–4.16	1742–1888
25	3.88–4.20	1758–1904
26	3.90–4.23	1769–1917
27	3.92–4.24	1776–1924
28	3.93–4.25	1781–1929
29	3.94–4.26	1785–1933
30	3.94–4.27	1788–1938
31	3.95–4.28	1791–1941
32	3.96–4.29	1794–1944
33	3.96–4.29	1797–1947
34	3.97–4.30	1800–1950
35	3.97–4.31	1803–1953
36	3.98–4.31	1806–1956
37	3.99–4.32	1808–1958
38	3.99–4.32	1810–1960
39	3.99–4.33	1812–1964
40	4.00–4.34	1815–1967
41	4.01–4.34	1818–1970
42	4.01–4.35	1821–1973
43	4.02–4.35	1823–1975
44	4.02–4.36	1825–1977
45	4.03–4.36	1827–1979
46	4.03–4.37	1830–1982
47	4.04–4.38	1833–1985
48	4.05–4.38	1836–1988
49	4.05–4.39	1838–1992
50	4.06–4.40	1841–1995
51	4.06–4.40	1843–1997
52	4.07–4.41	1845–1999
53	4.07–4.41	1847–2001
54	4.08–4.42	1849–2003
55	4.08–4.42	1852–2006
56	4.09–4.43	1855–2009
57	4.10–4.44	1858–2012
58	4.10–4.44	1860–2014
59	4.10–4.45	1861–2017
60	4.11–4.45	1863–2019
61	4.11–4.46	1865–2021
62	4.12–4.46	1867–2023
63	4.12–4.46	1869–2025
64	4.12–4.47	1871–2027
65	4.13–4.48	1874–2030
66	4.14–4.48	1877–2033
67	4.14–4.49	1879–2035
68	4.15–4.49	1881–2037
69	4.15–4.50	1883–2039
70	4.15–4.50	1884–2042
71	4.16–4.51	1886–2044
72	4.16–4.51	1888–2046
73	4.17–4.52	1890–2048
74	4.17–4.52	1892–2050
75	4.18–4.52	1894–2052
76	4.18–4.53	1896–2054
77	4.18–4.53	1898–2056
78	4.19–4.54	1900–2058
79	4.19–4.54	1902–2060
80	4.20–4.55	1904–2062
81	4.20–4.55	1905–2063
82	4.20–4.55	1907–2065
83	4.21–4.55	1908–2066
84	4.21–4.56	1909–2069
85	4.21–4.56	1910–2070
86	4.22–4.57	1912–2072
87	4.22–4.57	1913–2073
88	4.22–4.57	1915–2075
89	4.22–4.58	1916–2076
90	4.23–4.58	1917–2077
91	4.23–4.58	1918–2078
92	4.23–4.58	1919–2079
93	4.23–4.59	1920–2080
94	4.24–4.59	1921–2081
95	4.24–4.59	1922–2082

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



GERNERAL INFORMATION

Table 21: LOHMANN BROWN-LITE Performance Goals (Week 19 – 56)

Age	Liv-abil-ity	Num-ber of eggs	Rate of Lay H.D.	Body weight		Feed		Egg weight in week			Egg weight cumulative			% Grade A Large & Above		Egg mass			
				in g	in lbs.	Gram Feed/ Bird/ Day	Lbs. Feed/ 100/ Day	g	Oz./ Doz.	Net. Lbs./ 30 Doz. Case	g	Oz./ Doz.	Net. Lbs./ 30 Doz. Case	23 Oz.	24 Oz.	g/ H.D. in week	Oz./ Doz./ H.D. in week	cu-mula-tive kg/ H.H.	cu-mula-tive Lbs./ H.H.
19	100.00	0.7	10.0	1516	3.3	81	17.9	43.7	18.5	34.7	43.7	18.5	34.7	0	0	4.4	1.8	0.0	0.1
20	99.95	3.7	43.5	1596	3.5	86	19.0	46.5	19.7	36.9	46.0	19.5	36.5	1	0	20.2	8.6	0.2	0.4
21	99.90	8.4	66.2	1668	3.7	91	20.1	49.0	20.7	38.9	47.6	20.2	37.8	6	1	32.4	13.7	0.4	0.9
22	99.85	14.0	80.3	1738	3.8	96	21.2	51.2	21.7	40.6	49.1	20.8	38.9	19	6	41.1	17.4	0.7	1.5
23	99.80	20.1	88.0	1779	3.9	101	22.3	53.2	22.5	42.2	50.3	21.3	39.9	38	17	46.8	19.8	1.0	2.2
24	99.75	26.5	91.5	1815	4.0	104	22.9	54.9	23.2	43.5	51.4	21.8	40.8	55	32	50.2	21.2	1.4	3.0
25	99.70	33.0	92.9	1831	4.0	106	23.4	56.3	23.8	44.7	52.4	22.2	41.6	69	46	52.3	22.1	1.7	3.8
26	99.65	39.5	93.6	1843	4.1	107	23.6	57.4	24.3	45.6	53.2	22.5	42.2	78	57	53.7	22.7	2.1	4.6
27	99.60	46.1	94.0	1850	4.1	108	23.8	58.3	24.7	46.3	53.9	22.8	42.8	83	65	54.8	23.2	2.5	5.5
28	99.55	52.7	94.4	1855	4.1	108	23.8	59.0	25.0	46.8	54.6	23.1	43.3	87	71	55.7	23.6	2.9	6.3
29	99.50	59.3	94.7	1859	4.1	108	23.8	59.5	25.2	47.2	55.1	23.3	43.7	89	75	56.3	23.8	3.3	7.2
30	99.45	65.9	94.9	1863	4.1	108	23.8	59.9	25.4	47.6	55.6	23.5	44.1	91	78	56.9	24.1	3.7	8.1
31	99.35	72.5	95.1	1866	4.1	108	23.8	60.3	25.5	47.8	56.0	23.7	44.5	92	80	57.3	24.3	4.1	9.0
32	99.25	79.1	95.2	1869	4.1	108	23.8	60.6	25.6	48.1	56.4	23.9	44.8	93	82	57.7	24.4	4.5	9.8
33	99.15	85.7	95.3	1872	4.1	108	23.8	60.9	25.8	48.3	56.7	24.0	45.0	94	84	58.0	24.6	4.9	10.7
34	99.05	92.3	95.4	1875	4.1	108	23.8	61.1	25.9	48.5	57.1	24.2	45.3	94	85	58.3	24.7	5.3	11.6
35	98.95	98.9	95.4	1878	4.1	109	24.0	61.4	26.0	48.7	57.3	24.3	45.5	95	86	58.6	24.8	5.7	12.5
36	98.85	105.5	95.3	1881	4.1	109	24.0	61.6	26.1	48.9	57.6	24.4	45.7	95	87	58.8	24.9	6.1	13.4
37	98.75	112.1	95.2	1883	4.2	109	24.0	61.9	26.2	49.1	57.9	24.5	45.9	96	88	58.9	24.9	6.5	14.3
38	98.65	118.7	95.1	1885	4.2	109	24.0	62.1	26.3	49.3	58.1	24.6	46.1	96	89	59.0	25.0	6.9	15.2
39	98.55	125.2	95.0	1888	4.2	109	24.0	62.3	26.4	49.4	58.3	24.7	46.3	97	90	59.1	25.0	7.3	16.1
40	98.45	131.8	94.7	1891	4.2	109	24.0	62.5	26.4	49.6	58.5	24.8	46.4	97	91	59.2	25.1	7.7	17.0
41	98.35	138.3	94.5	1894	4.2	109	24.0	62.7	26.5	49.7	58.7	24.9	46.6	97	91	59.2	25.1	8.1	17.9
42	98.25	144.8	94.3	1897	4.2	109	24.0	62.8	26.6	49.9	58.9	24.9	46.7	97	92	59.2	25.1	8.5	18.8
43	98.15	151.2	94.0	1899	4.2	109	24.0	63.0	26.7	50.0	59.1	25.0	46.9	97	92	59.2	25.0	8.9	19.7
44	98.05	157.6	93.7	1901	4.2	109	24.0	63.1	26.7	50.1	59.2	25.1	47.0	98	93	59.1	25.0	9.3	20.6
45	97.95	164.0	93.3	1903	4.2	109	24.0	63.3	26.8	50.2	59.4	25.1	47.1	98	93	59.0	25.0	9.7	21.5
46	97.85	170.4	93.0	1906	4.2	109	24.0	63.4	26.8	50.3	59.5	25.2	47.3	98	93	58.9	24.9	10.1	22.4
47	97.75	176.8	92.6	1909	4.2	109	24.0	63.5	26.9	50.4	59.7	25.3	47.4	98	94	58.8	24.9	10.5	23.3
48	97.65	183.1	92.3	1912	4.2	109	24.0	63.6	26.9	50.5	59.8	25.3	47.5	98	94	58.7	24.9	11.0	24.1
49	97.55	189.3	91.9	1915	4.2	109	24.0	63.7	27.0	50.6	60.0	25.4	47.6	98	94	58.6	24.8	11.4	25.0
50	97.45	195.6	91.5	1918	4.2	109	24.0	63.9	27.0	50.7	60.1	25.4	47.7	98	95	58.5	24.7	11.7	25.9
51	97.35	201.8	91.2	1920	4.2	109	24.0	64.0	27.1	50.8	60.2	25.5	47.8	98	95	58.3	24.7	12.1	26.8
52	97.25	208.0	90.8	1922	4.2	109	24.0	64.1	27.1	50.8	60.3	25.5	47.9	98	95	58.1	24.6	12.5	27.7
53	97.15	214.1	90.4	1924	4.2	109	24.0	64.2	27.2	50.9	60.4	25.6	48.0	99	95	58.0	24.5	12.9	28.5
54	97.05	220.2	90.0	1926	4.2	109	24.0	64.3	27.2	51.0	60.5	25.6	48.0	99	95	57.8	24.5	13.3	29.4
55	96.95	226.3	89.6	1929	4.3	109	24.0	64.3	27.2	51.1	60.6	25.7	48.1	99	96	57.6	24.4	13.7	30.2
56	96.85	232.4	89.2	1932	4.3	109	24.0	64.4	27.3	51.1	60.7	25.7	48.2	99	96	57.5	24.3	14.1	31.1

Table 21: LOHMANN BROWN-LITE Performance Goals (Week 57 – 95)

Age	Liv-abil-ity	Num-ber of eggs	Rate of Lay H.D.	Body weight		Feed		Egg weight in week			Egg weight cumulative			% Grade A Large & Above		Egg mass			
				in g	in lbs.	Gram Feed/ Bird/ Day	Lbs. Feed/ 100/ Day	g	Oz./ Doz.	Net. Lbs./ 30 Doz. Case	g	Oz./ Doz.	Net. Lbs./ 30 Doz. Case	23 Oz.	24 Oz.	g/ H.D. in week	Oz./ Doz./ H.D. in week	cu-mula-tive kg/ H.H.	cu-mula-tive Lbs./ H.H.
57	96.75	238.4	88.7	1935	4.3	109	24.0	64.5	27.3	51.2	60.8	25.7	48.3	99	96	57.3	24.2	14.5	32.0
58	96.65	244.3	88.3	1937	4.3	109	24.0	64.6	27.4	51.3	60.9	25.8	48.3	99	96	57.1	24.2	14.9	32.8
59	96.55	250.3	87.9	1939	4.3	109	24.0	64.7	27.4	51.4	61.0	25.8	48.4	99	96	56.9	24.1	15.3	33.7
60	96.45	256.2	87.4	1941	4.3	109	24.0	64.8	27.4	51.4	61.1	25.9	48.5	99	96	56.6	24.0	15.7	34.5
61	96.35	262.0	87.0	1943	4.3	109	24.0	64.9	27.5	51.5	61.2	25.9	48.6	99	96	56.4	23.9	16.0	35.3
62	96.25	267.9	86.5	1945	4.3	109	24.0	65.0	27.5	51.5	61.3	25.9	48.6	99	97	56.2	23.8	16.4	36.2
63	96.15	273.7	86.1	1947	4.3	109	24.0	65.0	27.5	51.6	61.3	26.0	48.7	99	97	56.0	23.7	16.8	37.0
64	96.05	279.4	85.6	1949	4.3	109	24.0	65.1	27.6	51.7	61.4	26.0	48.7	99	97	55.7	23.6	17.2	37.8
65	95.95	285.1	85.1	1952	4.3	109	24.0	65.2	27.6	51.7	61.5	26.0	48.8	99	97	55.5	23.5	17.5	38.7
66	95.85	290.8	84.6	1955	4.3	109	24.0	65.3	27.6	51.8	61.6	26.1	48.9	99	97	55.2	23.4	17.9	39.5
67	95.75	296.5	84.1	1957	4.3	109	24.0	65.3	27.7	51.9	61.6	26.1	48.9	99	97	55.0	23.3	18.3	40.3
68	95.65	302.1	83.6	1959	4.3	109	24.0	65.4	27.7	51.9	61.7	26.1	49.0	99	97	54.7	23.2	18.6	41.1
69	95.55	307.6	83.1	1961	4.3	109	24.0	65.5	27.7	52.0	61.8	26.1	49.0	99	97	54.4	23.0	19.0	41.9
70	95.45	313.1	82.6	1963	4.3	109	24.0	65.5	27.7	52.0	61.8	26.2	49.1	99	97	54.1	22.9	19.4	42.7
71	95.35	318.6	82.1	1965	4.3	109	24.0	65.6	27.8	52.1	61.9	26.2	49.1	99	97	53.9	22.8	19.7	43.5
72	95.25	324.1	81.6	1967	4.3	109	24.0	65.7	27.8	52.1	62.0	26.2	49.2	99	97	53.6	22.7	20.1	44.3
73	95.15	329.4	81.0	1969	4.3	109	24.0	65.7	27.8	52.2	62.0	26.3	49.2	99	98	53.3	22.5	20.4	45.1
74	95.05	334.8	80.5	1971	4.3	109	24.0	65.8	27.9	52.2	62.1	26.3	49.3	99	98	53.0	22.4	20.8	45.8
75	94.95	340.1	79.9	1973	4.3	109	24.0	65.9	27.9	52.3	62.2	26.3	49.3	99	98	52.6	22.3	21.1	46.6
76	94.85	345.4	79.4	1975	4.4	109	24.0	65.9	27.9	52.3	62.2	26.3	49.4	99	98	52.3	22.1	21.5	47.4
77	94.75	350.6	78.8	1977	4.4	109	24.0	66.0	27.9	52.4	62.3	26.4	49.4	99	98	52.0	22.0	21.8	48.1
78	94.65	355.8	78.3	1979	4.4	109	24.0	66.0	27.9	52.4	62.3	26.4	49.5	99	98	51.7	21.9	22.2	48.9
79	94.55	360.9	77.7	1981	4.4	109	24.0	66.1	28.0	52.4	62.4	26.4	49.5	99	98	51.3	21.7	22.5	49.6
80	94.45	366.0	77.1	1983	4.4	109	24.0	66.1	28.0	52.5	62.4	26.4	49.5	99	98	51.0	21.6	22.9	50.4
81	94.35	371.1	76.5	1984	4.4	109	24.0	66.2	28.0	52.5	62.5	26.4	49.6	99	98	50.6	21.4	23.2	51.1
82	94.25	376.1	75.9	1986	4.4	109	24.0	66.2	28.0	52.5	62.5	26.5	49.6	99	98	50.3	21.3	23.5	51.8
83	94.15	381.1	75.3	1987	4.4	109	24.0	66.3	28.0	52.6	62.6	26.5	49.7	99	98	49.9	21.1	23.8	52.6
84	94.05	386.0	74.7	1989	4.4	109	24.0	66.3	28.1	52.6	62.6	26.5	49.7	100	98	49.5	21.0	24.2	53.3
85	93.95	390.9	74.1	1990	4.4	109	24.0	66.3	28.1	52.7	62.7	26.5	49.7	100	98	49.1	20.8	24.5	54.0
86	93.85	395.7	73.5	1992	4.4	109	24.0	66.4	28.1	52.7	62.7	26.5	49.8	100	98	48.8	20.6	24.8	54.7
87	93.75	400.5	72.8	1993	4.4	109	24.0	66.4	28.1	52.7	62.8	26.6	49.8	100	98	48.4	20.5	25.1	55.4
88	93.65	405.2	72.2	1995	4.4	109	24.0	66.5	28.1	52.7	62.8	26.6	49.8	100	98	48.0	20.3	25.4	56.1
89	93.55	409.9	71.5	1996	4.4	109	24.0	66.5	28.1	52.8	62.8	26.6	49.9	100	98	47.6	20.1	25.8	56.8
90	93.45	414.5	70.9	1997	4.4	109	24.0	66.5	28.2	52.8	62.9	26.6	49.9	100	98	47.1	20.0	26.1	57.5
91	93.35	419.1	70.2	1998	4.4	109	24.0	66.5	28.2	52.8	62.9	26.6	49.9	100	98	46.7	19.8	26.4	58.1
92	93.25	423.7	69.6	1999	4.4	109	24.0	66.6	28.2	52.8	63.0	26.7	50.0	100	98	46.3	19.6	26.7	58.8
93	93.15	428.1	68.9	2000	4.4	109	24.0	66.6	28.2	52.9	63.0	26.7	50.0	100	98	45.9	19.4	27.0	59.5
94	93.05	432.6	68.2	2001	4.4	109	24.0	66.6	28.2	52.9	63.0	26.7	50.0	100	98	45.4	19.2	27.3	60.1
95	92.95	437.0	67.5	2002	4.4	109	24.0	66.7	28.2	52.9	63.1	26.7	50.1	100	98	45.0	19.0	27.6	60.8

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Table 23: LOHMANN BROWN-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	43.7	34.7	35.0	62.3	2.7	0.0	0.0	0.0
20	46.5	36.9	11.3	72.0	16.6	0.1	0.0	0.0
21	49.0	38.9	3.0	54.3	41.5	1.2	0.0	0.0
22	51.2	40.6	0.8	32.0	60.9	6.3	0.0	0.0
23	53.2	42.2	0.2	16.8	65.9	16.9	0.2	0.0
24	54.9	43.5	0.1	8.6	59.9	30.5	1.0	0.0
25	56.3	44.7	0.0	4.5	49.9	42.8	2.8	0.0
26	57.4	45.6	0.0	2.6	40.4	51.4	5.6	0.0
27	58.3	46.3	0.0	1.7	33.1	56.3	8.8	0.1
28	59.0	46.8	0.0	1.2	27.8	58.8	12.1	0.2
29	59.5	47.2	0.0	0.9	24.1	59.8	14.9	0.3
30	59.9	47.6	0.0	0.7	21.4	60.0	17.4	0.5
31	60.3	47.8	0.0	0.6	19.3	59.9	19.6	0.6
32	60.6	48.1	0.0	0.5	17.5	59.5	21.7	0.8
33	60.9	48.3	0.0	0.4	16.0	58.9	23.7	0.9
34	61.1	48.5	0.0	0.4	14.6	58.2	25.7	1.1
35	61.4	48.7	0.0	0.3	13.4	57.4	27.6	1.4
36	61.6	48.9	0.0	0.3	12.3	56.4	29.3	1.6
37	61.9	49.1	0.0	0.2	11.4	55.5	31.0	1.9
38	62.1	49.3	0.0	0.2	10.6	54.5	32.6	2.2
39	62.3	49.4	0.0	0.2	9.8	53.5	34.0	2.4
40	62.5	49.6	0.0	0.2	9.2	52.5	35.4	2.7
41	62.7	49.7	0.0	0.1	8.6	51.5	36.7	3.0
42	62.8	49.9	0.0	0.1	8.1	50.6	37.9	3.3
43	63.0	50.0	0.0	0.1	7.6	49.6	39.0	3.6
44	63.1	50.1	0.0	0.1	7.2	48.7	40.0	3.9
45	63.3	50.2	0.0	0.1	6.8	47.9	40.9	4.3
46	63.4	50.3	0.0	0.1	6.5	47.0	41.8	4.6
47	63.5	50.4	0.0	0.1	6.2	46.3	42.6	4.9
48	63.6	50.5	0.0	0.1	5.9	45.5	43.3	5.2
49	63.7	50.6	0.0	0.1	5.7	44.7	44.1	5.5
50	63.9	50.7	0.0	0.1	5.4	44.0	44.8	5.8
51	64.0	50.8	0.0	0.1	5.2	43.3	45.4	6.1
52	64.1	50.8	0.0	0.1	5.0	42.6	45.9	6.4
53	64.2	50.9	0.0	0.1	4.8	41.9	46.5	6.7
54	64.3	51.0	0.0	0.1	4.6	41.2	47.1	7.0
55	64.3	51.1	0.0	0.1	4.4	40.6	47.5	7.3
56	64.4	51.1	0.0	0.1	4.3	39.9	48.1	7.7

** excluding double-yolk eggs*

Table 23: LOHMANN BROWN-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
57	64.5	51.2	0.0	0.0	4.1	39.3	48.5	8.0
58	64.6	51.3	0.0	0.0	4.0	38.7	49.0	8.3
59	64.7	51.4	0.0	0.0	3.8	38.1	49.4	8.6
60	64.8	51.4	0.0	0.0	3.7	37.5	49.8	9.0
61	64.9	51.5	0.0	0.0	3.6	37.0	50.1	9.3
62	65.0	51.5	0.0	0.0	3.4	36.4	50.5	9.6
63	65.0	51.6	0.0	0.0	3.3	35.9	50.8	10.0
64	65.1	51.7	0.0	0.0	3.2	35.3	51.1	10.3
65	65.2	51.7	0.0	0.0	3.1	34.8	51.4	10.6
66	65.3	51.8	0.0	0.0	3.0	34.3	51.7	11.0
67	65.3	51.9	0.0	0.0	2.9	33.8	52.0	11.3
68	65.4	51.9	0.0	0.0	2.8	33.3	52.2	11.6
69	65.5	52.0	0.0	0.0	2.7	32.8	52.4	12.0
70	65.5	52.0	0.0	0.0	2.7	32.4	52.6	12.2
71	65.6	52.1	0.0	0.0	2.6	31.9	52.8	12.6
72	65.7	52.1	0.0	0.0	2.5	31.5	53.0	12.9
73	65.7	52.2	0.0	0.0	2.4	31.1	53.2	13.2
74	65.8	52.2	0.0	0.0	2.4	30.7	53.4	13.5
75	65.9	52.3	0.0	0.0	2.3	30.4	53.5	13.8
76	65.9	52.3	0.0	0.0	2.3	30.0	53.6	14.1
77	66.0	52.4	0.0	0.0	2.2	29.6	53.8	14.4
78	66.0	52.4	0.0	0.0	2.2	29.3	53.9	14.7
79	66.1	52.4	0.0	0.0	2.1	28.9	54.0	14.9
80	66.1	52.5	0.0	0.0	2.1	28.6	54.1	15.2
81	66.2	52.5	0.0	0.0	2.0	28.3	54.2	15.5
82	66.2	52.5	0.0	0.0	2.0	28.0	54.2	15.7
83	66.3	52.6	0.0	0.0	1.9	27.7	54.3	16.0
84	66.3	52.6	0.0	0.0	1.9	27.5	54.4	16.2
85	66.3	52.7	0.0	0.0	1.9	27.2	54.4	16.4
86	66.4	52.7	0.0	0.0	1.8	27.0	54.5	16.7
87	66.4	52.7	0.0	0.0	1.8	26.7	54.5	16.9
88	66.5	52.7	0.0	0.0	1.8	26.5	54.6	17.1
89	66.5	52.8	0.0	0.0	1.8	26.4	54.6	17.3
90	66.5	52.8	0.0	0.0	1.7	26.2	54.6	17.4
91	66.5	52.8	0.0	0.0	1.7	26.0	54.7	17.6
92	66.6	52.8	0.0	0.0	1.7	25.8	54.7	17.8
93	66.6	52.9	0.0	0.0	1.7	25.6	54.7	18.0
94	66.6	52.9	0.0	0.0	1.7	25.5	54.7	18.1
95	66.7	52.9	0.0	0.0	1.6	25.3	54.8	18.3

** excluding double-yolk eggs*

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Table 24: LOHMANN BROWN-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	43.7	34.7	35.0	62.3	2.7	0.0	0.0	0.0
20	46.5	36.9	23.1	67.2	9.6	0.0	0.0	0.0
21	49.0	38.9	16.4	62.9	20.3	0.4	0.0	0.0
22	51.2	40.6	12.5	55.2	30.4	1.9	0.0	0.0
23	53.2	42.2	10.1	47.5	37.5	4.9	0.0	0.0
24	54.9	43.5	8.4	41.0	41.2	9.2	0.2	0.0
25	56.3	44.7	7.2	35.8	42.5	14.0	0.6	0.0
26	57.4	45.6	6.3	31.6	42.2	18.6	1.2	0.0
27	58.3	46.3	5.6	28.3	41.2	22.8	2.0	0.0
28	59.0	46.8	5.0	25.6	39.9	26.4	3.1	0.0
29	59.5	47.2	4.6	23.4	38.4	29.5	4.1	0.1
30	59.9	47.6	4.2	21.5	37.0	32.0	5.2	0.1
31	60.3	47.8	3.9	19.9	35.6	34.1	6.3	0.1
32	60.6	48.1	3.6	18.5	34.4	36.0	7.4	0.2
33	60.9	48.3	3.4	17.3	33.1	37.5	8.5	0.2
34	61.1	48.5	3.1	16.2	32.0	38.8	9.6	0.3
35	61.4	48.7	3.0	15.3	30.9	39.9	10.7	0.4
36	61.6	48.9	2.8	14.4	29.8	40.8	11.7	0.4
37	61.9	49.1	2.7	13.7	28.9	41.6	12.7	0.5
38	62.1	49.3	2.5	13.0	28.0	42.2	13.7	0.6
39	62.3	49.4	2.4	12.4	27.1	42.8	14.7	0.7
40	62.5	49.6	2.3	11.9	26.3	43.2	15.6	0.8
41	62.7	49.7	2.2	11.3	25.5	43.6	16.5	0.9
42	62.8	49.9	2.1	10.9	24.8	43.8	17.4	1.0
43	63.0	50.0	2.0	10.4	24.1	44.1	18.3	1.1
44	63.1	50.1	1.9	10.0	23.5	44.3	19.1	1.2
45	63.3	50.2	1.9	9.7	22.8	44.4	19.9	1.3
46	63.4	50.3	1.8	9.3	22.3	44.5	20.7	1.4
47	63.5	50.4	1.7	9.0	21.7	44.5	21.5	1.5
48	63.6	50.5	1.7	8.7	21.2	44.6	22.2	1.7
49	63.7	50.6	1.6	8.4	20.7	44.6	22.9	1.8
50	63.9	50.7	1.6	8.2	20.2	44.6	23.6	1.9
51	64.0	50.8	1.5	7.9	19.7	44.5	24.2	2.0
52	64.1	50.8	1.5	7.7	19.3	44.5	24.9	2.2
53	64.2	50.9	1.4	7.5	18.9	44.4	25.5	2.3
54	64.3	51.0	1.4	7.3	18.5	44.3	26.1	2.4
55	64.3	51.1	1.4	7.1	18.1	44.2	26.7	2.6
56	64.4	51.1	1.3	6.9	17.8	44.1	27.2	2.7

** excluding double-yolk eggs*

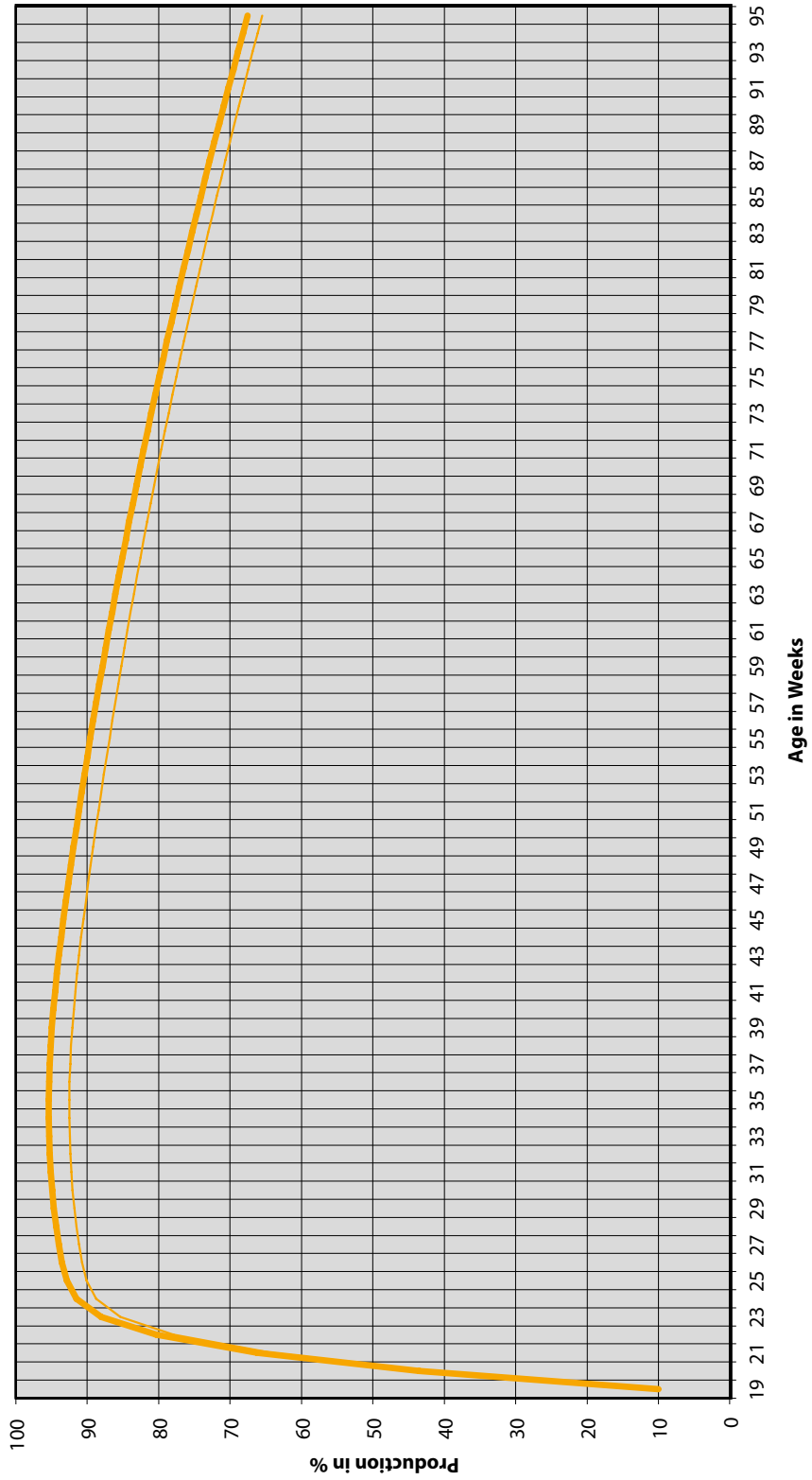
Table 24: LOHMANN BROWN-LITE Expected Egg Grades (%) for different Egg weights* – cumulative over Production Period
(Week 57 – 95)

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
57	64.5	51.2	1.3	6.7	17.4	44.0	27.8	2.8
58	64.6	51.3	1.3	6.6	17.1	43.8	28.3	3.0
59	64.7	51.4	1.2	6.4	16.7	43.7	28.8	3.1
60	64.8	51.4	1.2	6.2	16.4	43.6	29.3	3.2
61	64.9	51.5	1.2	6.1	16.1	43.4	29.8	3.4
62	65.0	51.5	1.1	6.0	15.8	43.2	30.3	3.5
63	65.0	51.6	1.1	5.8	15.6	43.1	30.7	3.7
64	65.1	51.7	1.1	5.7	15.3	42.9	31.2	3.8
65	65.2	51.7	1.1	5.6	15.0	42.7	31.6	4.0
66	65.3	51.8	1.0	5.5	14.8	42.6	32.0	4.1
67	65.3	51.9	1.0	5.4	14.5	42.4	32.4	4.2
68	65.4	51.9	1.0	5.3	14.3	42.2	32.8	4.4
69	65.5	52.0	1.0	5.1	14.1	42.0	33.2	4.5
70	65.5	52.0	1.0	5.1	13.9	41.8	33.6	4.7
71	65.6	52.1	1.0	5.0	13.7	41.6	34.0	4.8
72	65.7	52.1	0.9	4.9	13.4	41.5	34.3	5.0
73	65.7	52.2	0.9	4.8	13.2	41.3	34.7	5.1
74	65.8	52.2	0.9	4.7	13.1	41.1	35.0	5.3
75	65.9	52.3	0.9	4.6	12.9	40.9	35.3	5.4
76	65.9	52.3	0.9	4.5	12.7	40.7	35.6	5.6
77	66.0	52.4	0.9	4.5	12.5	40.5	35.9	5.7
78	66.0	52.4	0.8	4.4	12.3	40.3	36.2	5.9
79	66.1	52.4	0.8	4.3	12.2	40.1	36.5	6.0
80	66.1	52.5	0.8	4.2	12.0	40.0	36.8	6.2
81	66.2	52.5	0.8	4.2	11.8	39.8	37.1	6.3
82	66.2	52.5	0.8	4.1	11.7	39.6	37.3	6.5
83	66.3	52.6	0.8	4.0	11.5	39.4	37.6	6.6
84	66.3	52.6	0.8	4.0	11.4	39.2	37.9	6.8
85	66.3	52.7	0.8	3.9	11.3	39.0	38.1	6.9
86	66.4	52.7	0.7	3.9	11.1	38.9	38.4	7.1
87	66.4	52.7	0.7	3.8	11.0	38.7	38.6	7.2
88	66.5	52.7	0.7	3.8	10.8	38.5	38.8	7.3
89	66.5	52.8	0.7	3.7	10.7	38.3	39.0	7.5
90	66.5	52.8	0.7	3.7	10.6	38.2	39.3	7.6
91	66.5	52.8	0.7	3.6	10.5	38.0	39.5	7.8
92	66.6	52.8	0.7	3.6	10.4	37.8	39.7	7.9
93	66.6	52.9	0.7	3.5	10.2	37.7	39.9	8.0
94	66.6	52.9	0.7	3.5	10.1	37.5	40.1	8.2
95	66.7	52.9	0.7	3.4	10.0	37.4	40.3	8.3

** excluding double-yolk eggs*

GERNERAL INFORMATION

Egg Production Curve for LOHMANN BROWN-LITE Layers



NOTES

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INFORMATION

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

ME MJ/kg = g crude protein x 0.01551
+ g crude fat x 0.03431
+ g starch x 0.01669
+ g sugar x 0.01301 (as saccharose)

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

CONSULTATION AND DIAGNOSTICS IN ALL QUESTIONS OF POULTRY HEALTH THROUGH:

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