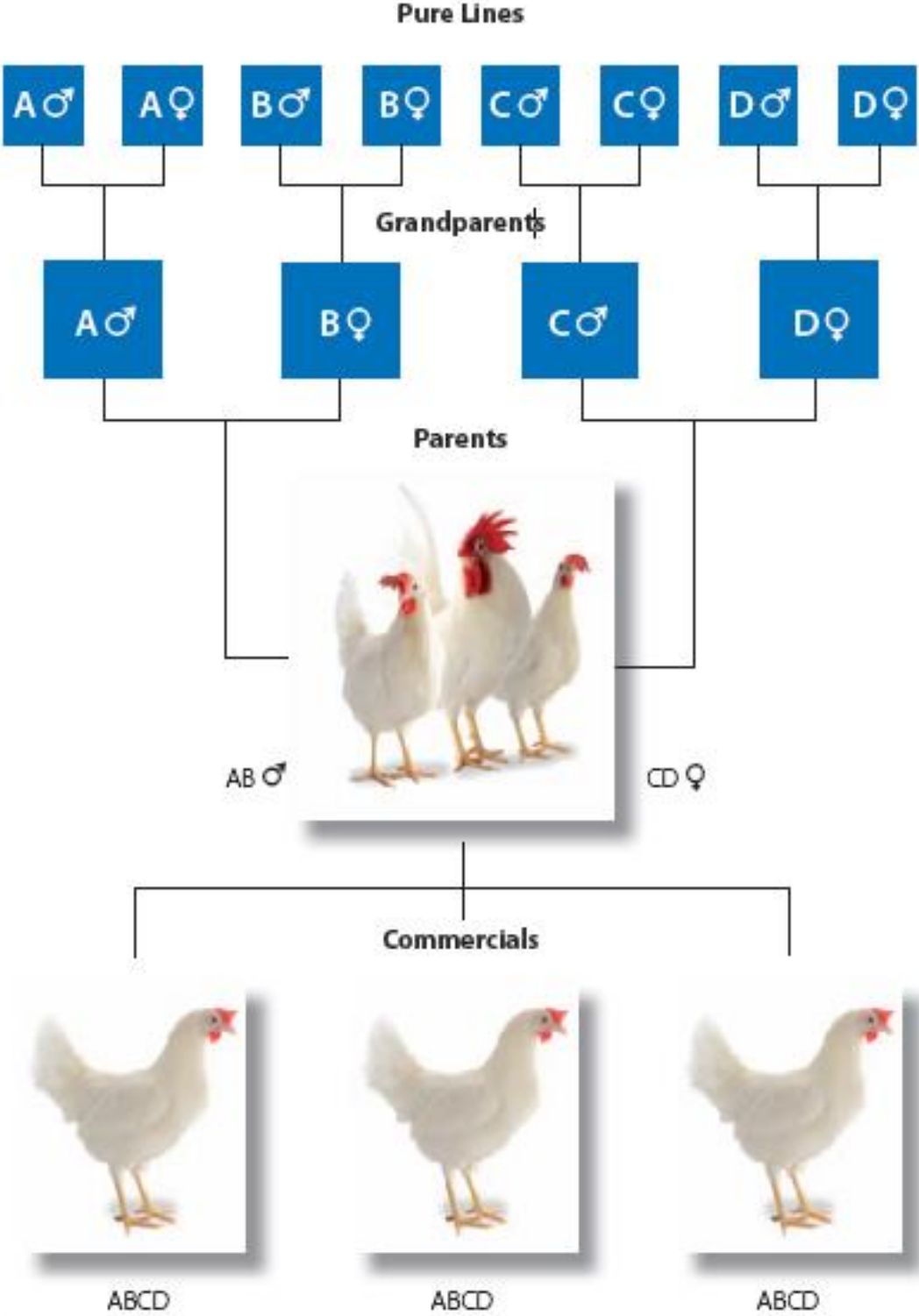


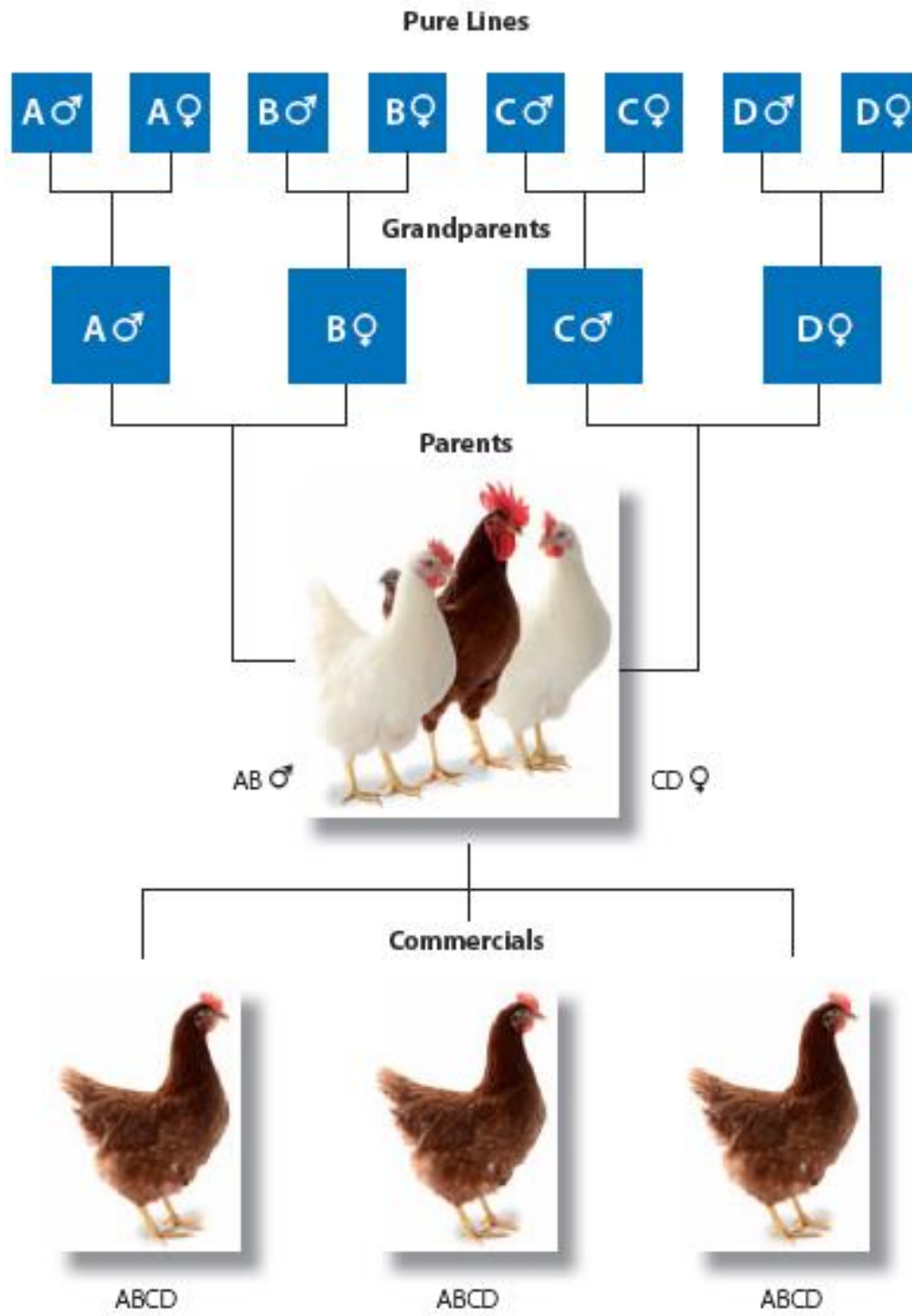


# Layer Breeder Flock

LOHMANN LSL



# LOHMANN BROWN



## Some performance index of layer breeder flock

performance index	Record	
Livability	92%	
Average egg production	275(200)	
Age at 50% production	20-22 weeks	
Peak production	26-30 weeks	
Hatchability	80%	
	Female	Male
Live weight	20 wks- 1700g 40wks-2000g 72wks-2100g	20 wks-2200g 40wks-2800g 72wks-3000g
Feed Consumption		
Age	Amount of feed	
Growing cycle (0-20wks)	7.8kg	
Production cycle(21-72wks)	40.0kg	

## Housing, feeder and drinker space Requirements for Breeder layer flock:

### Floor Space

Floor Type	Age of birds	Allocated space
Floor/Litter	Day Old – 18 weeks	8 – 10 birds/m <sup>2</sup>
Floor/Litter	18 – 72 weeks	6 – 8 birds/m <sup>2</sup>
100 % Slated Floor	18 – 72 weeks	8 – 10 birds/m <sup>2</sup>

### Feeder space

Feeder Type	Age of birds	Allocated space
Trough-type	Day Old – 18 weeks	5 – 10 cm/bird
Pan-type	Day Old – 18 weeks	30 – 35 birds/pan
Trough-type	19 – 72 weeks	10 cm/bird
Pan-type	19 – 72 weeks	25 – 30 birds/pan
Chain feeder	3-10 weeks 11-20 weeks	2.5-3.5 lin.m for 100 chicks 4.5 lin.m for 100 chicks

### Drinker space

Drinker Type	Age of birds	Allocated space
Water jug	First 7 days	4 liter water jug/100 chicks in addition to automatic water system
Trough drinker	Week: 2 –72 weeks	2.5 cm trough space/bird
Cup drinker		1 cup/25 – 35 birds
round automatic drinker		1 large round automatic drinker for every 150 birds
nipple drinker		1 nipple drinker/4 – 6 birds

## Another info.

Equipment	Age in Weeks	Requirement
Chick founts	1	1 fount (4 – 5 l) for 100 chicks
Round drinkers	to 20	1 drinker (Ø 46 cm) for 125 birds
Linear drinkers	to 20	1 running m for 100 birds
Nipple drinkers	to 20	6 – 8 birds per nipple
Chick feeding trays	1 – 2	1 tray for 60 chicks
Cut off chick cartons	1 – 2	1 carton for 100 chicks
Round feeders	3 – 10	2 feeders (Ø 40 cm) for 100 birds
	11 – 20	3 feeders (Ø 40 cm) for 100 birds
Chain feeders	3 – 10	2.5 – 3.5 lin. m for 100 birds
	11 – 20	4.5 lin. m for 100 birds

■ ***Follow the Instructions of Manufacturer!***

## Temperature Requirements

Age	Temperature °C
Day 1 – 2	35 – 36
Day 3 – 4	33 – 34
Day 5 – 7	31 – 32
Week 2	28 – 29
Week 3	26 – 27
Week 4	22 – 24
Week 5 -72	18 – 20

## Humidity Requirements: 60-70%

Humidity is an important aspect of successful brooding. The relative humidity (determined with a wet bulb thermometer), should be maintained on an optimal level, i.e. between 60 and 70 %. Humidity is usually not a problem after 6 weeks of age because it is easier to maintain a satisfactory moisture level at lower temperatures. Besides, the older, larger birds also exhale a considerable amount of moisture into the atmosphere.

## 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

## Lighting Program

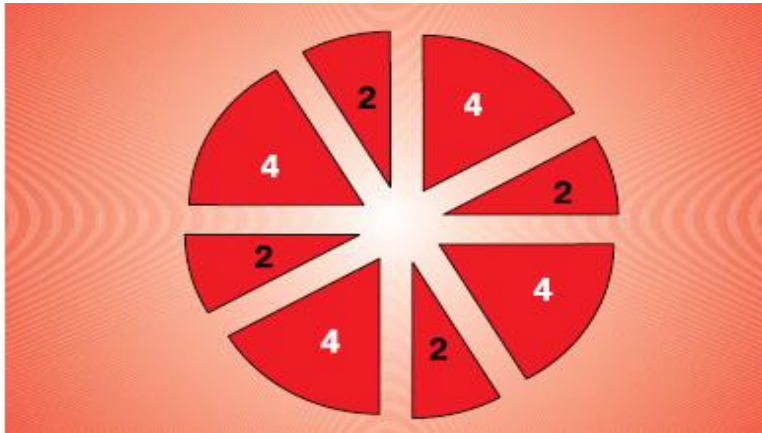
### Intermittent Lighting Program in Rearing for Day Old Chicks

When the day old chicks arrive on the farm, they have been intensively handled in the hatchery and often had a long transport to their final destination. Common practice is to give them in the first 2 or 3 days after arrival, 24 hours light to help them to recover and to provide those chicks enough time to eat and to drink.

#### First Two Weeks

The lighting program for all flocks in all types of housing is the same for the first two weeks. **During the first two days parent stock should be given 24 hours of light each day** or an intermittent lighting program can be applied. The intensity should be 10 lux. On day 3, reduce the duration of the light to 16 hours per day and decrease the intensity to 5 – 7.5 lux.

## Lighting Program after arrival of chicks



4 hours light  
2 hours darkness  
4 hours light  
2 hours darkness  
4 hours light  
2 hours darkness  
4 hours light  
2 hours darkness

This program can be used for up to 14 days after arrival. Then switch to the regular step-down lighting program.

### **The benefits of using such a program are:**

- ✓ Chicks can take rest or sleep at the same time. Chicks' behavior is synchronized.
- ✓ Weaker chicks are stimulated by stronger ones to be active and to eat and drink.
- ✓ Flock behavior is more uniform, which makes the chick assessment easier.
- ✓ Mortality in the first week is reduced.

## Lighting Program (0-72wks)

Age (Weeks)	Hours of Light (Standard)	Light Intensity (Lux*)
Day 1 – 2 **	24	20 – 40
Day 3 – 6 **	20	20 – 30
2	16	10 – 20
3	12	5 – 10
4	9	5 – 10
5	9	5 – 10
6	9	5 – 10
7	9	5 – 10
8	9	5 – 10
9	9	5 – 10
10	9	5 – 10
11	9	5 – 10
12	9	5 – 10

\* *Lux = Lumen/m<sup>2</sup>*

\*\* *or run an Intermittent Lighting Programme*

Age (Weeks)	Hours of Light (Standard)	Light Intensity (Lux*)
13	9	5 – 10
14	9	5 – 10
15	9	5 – 10
16	9	5 – 10
17	9	5 – 10
18	11	5 – 10
19	12	5 – 10
20	13	20 – 30
21	14 <sup>***</sup>	20 – 30
22	14.5 <sup>***</sup>	20 – 30
23	15 <sup>***</sup>	20 – 30
24	15.5 <sup>***</sup>	20 – 30
25 <sup>****</sup>	16 <sup>***</sup>	20 – 30

\*\*\* According to recent research results, 14 hours of light are sufficient during production provided the house is light tight.

\*\*\*\* until the end of production

## Nutrition: Recommended Nutrient Levels (Rearing)

Diet type*		Starter	Grower	Developer	Pre-Layer
Nutrient		1 – 3 weeks	4 – 8 weeks	9 – 17/18 weeks	18/19 weeks – 5 % prod.
Metabol. Energy	kcal	2900	2720 – 2800	2720 – 2800	2720 – 2800
	MJ	12.00	11.40 – 11.70	11.40 – 11.70	11.40 – 11.70
Crude Protein	%	20.00	18.50	15.00	17.50
Methionine	%	0.48	0.40	0.34	0.36
Dig. Methionine	%	0.39	0.33	0.28	0.29
Meth./Cysteine	%	0.83	0.70	0.60	0.68
Dig. M/C	%	0.68	0.57	0.50	0.56
Lysine	%	1.20	1.00	0.68	0.85
Dig. Lysine	%	0.98	0.82	0.55	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	0.17	0.20
Dig. Tryptophan	%	0.19	0.17	0.14	0.16
Threonine	%	0.80	0.70	0.55	0.60
Dig. Threonine	%	0.65	0.57	0.44	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	2.00
Phosphorus, total	%	0.75	0.70	0.58	0.65
Phosphorus, avail.	%	0.48	0.45	0.37	0.45
Sodium	%	0.18	0.17	0.16	0.16
Chloride	%	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.

Table 5: **LOHMANN BROWN** Parent Stock Females  
 Body Weight Development, Feed Consumption and  
 Water Consumption with Standard Lighting Programme

Age in Weeks	Body Weight (g)			kJ Bird/Day	Feed Consumption		Water Consumption	
	Average	Range			g/Bird/Day	Cumulative (g)	ml/Bird/Day	Cumulative (ml)
1	65	62	68	120	10	70	18	126
2	130	124	137	228	19	203	33	357
3	180	171	189	300	25	378	44	665
4	250	238	263	342	30	588	53	1036
5	320	304	336	399	35	833	61	1463
6	410	390	431	456	40	1113	70	1673
7	500	475	525	513	45	1428	79	2226
8	590	561	620	570	50	1778	88	2842
9	680	646	714	616	54	2156	95	3507
10	770	732	809	650	57	2555	100	4207
11	860	817	903	684	60	2975	105	4942
12	950	903	998	718	63	3416	110	5712
13	1030	979	1082	752	66	3878	116	6524
14	1110	1055	1166	787	69	4361	121	7371
15	1190	1131	1250	821	72	4865	126	8253
16	1270	1207	1334	855	75	5390	131	9170
17	1350	1283	1418	889	78	5936	137	10129
18	1440	1368	1512	923	81	6503	142	11123
19	1530	1454	1607	958	84	7091	147	12152
20	1600*	1520	1680	992	87	7700	152	13216

\* Depends upon sexual maturity - 100 – 200 g higher for hens in production.

■ Variation is possible due to differences in feed consumption and environments.

## Micro-Nutrients

The supplementation of parent stock feed with micro-nutrients like essential vitamins, trace elements and substances like antioxidants, coccidiostats and organic acids are essential for maximum hatching egg production and hatchability. By adding these micronutrients in suitable quantities, varying contents in the raw materials are compensated and the correct supply to the parent stock is safeguarded.

Remark: Vitamin C is synthesized by poultry normally. This vitamin is not considered as essential, but 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.**

Supplements per kg Feed		Starter/Grower	Developer	Pre-Layer/Phase I + II
Vitamin A	I.U.	12000	12000	15000
Vitamin D <sub>3</sub>	I.U.	2500	2500	3000
Vitamin E	mg	20–30**	20–30**	50–100**
Vitamin K <sub>3</sub>	mg	3***	3***	5***
Vitamin B <sub>1</sub>	mg	2	2	4
Vitamin B <sub>2</sub>	mg	8	6	10
Vitamin B <sub>6</sub>	mg	4	4	6
Vitamin B <sub>12</sub>	mcg	20	20	30
Pantothenic Acid	mg	10	10	20
Nicotinic Acid	mg	30	30	50
Folic Acid	mg	1	1	2
Biotin	mcg	100	100	200
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	40	40	40
Copper*	mg	5	5	10
Iodine	mg	1	1	1
Selenium*	mg	0.3	0.3	0.3

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

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

## 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
Layer Phase 1	30%	70%
Layer Phase 2	25%	75%

*\* can be partly replaced by oyster shells*

## Heat Treatment

As a preventive measure against salmonella and other bacteria/viruses a heat treatment of the feed is sometimes applied. Depending upon the treatment technique the efficiency of specific micro-nutrients can be damaged. These micro-nutrients must therefore be added in higher quantities. According to experience mainly **Vitamin A and K3 are affected.**

## Beak treatment

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, and under supply of nutrients, poor ventilation, over stocking or dullness. Especially in floor management or open houses with uncontrollable light intensity

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 chick's hatch.** This procedure can 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 chick's 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.
- Under optimal housing conditions, males should generally not be beak treated. Nevertheless, if a beak treatment for males is necessary, just treat them very gently.

### Mating Ratio

Depending on environmental conditions, the mating ratio ranges between 8 and 10 males per 100 females. In controlled environment, usually 8 – 9 males per 100 females are sufficient. In open houses, on slatted floors and hot climate 9 – 10 males per 100 females are recommended. More males than needed cause disturbance in the flock, resulting in reduced fertility.

## Nests and Egg Collection

Quality of nests is also a factor which affects egg quality. Regularly renew the litter in litter-type nests and keep them clean. Provide individual nests at a rate of one nest for 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:

- frequent collection of floor eggs
- no air flow in the nest area
- clean, dry litter or soft nest lining
- keep only one type of nest in the house
- easy access to the nest
- even distribution of the nests within the house

## Bio-security measures

1. General preventive measures
2. Vaccination program
3. Use of preventive medicine and
4. Treatment

## Vaccination program

Disease	Occurrence		Application Methods	Remarks
	World-wide	Locally		
Marek	●		SC-IM	Day 1 – Hatchery
Newcastle*	●		DW-SP-SC-IM	Number of vaccinations according to disease pressure
Gumboro (IBD)*	●		DW	2 live vaccinations recommended
Infectious Bronchitis*	●		DW-SP-SC-IM	Number of vaccinations according to disease pressure
AE	●		DW-SC-WW	Vaccination between 8 – 14 weeks
CAV	●		DW-SC-IM	Vaccination between 8 – 14 weeks
Mycoplasmosis		●	SP-ED-SC-IM	Vaccination before transfer
Fowl Pox		●	WW	Vaccination before transfer
Pasteurellosis		●	SC	2 vaccinations between 8 – 14 weeks
Infectious Coryza		●	SC	2 vaccinations between 8 – 14 weeks
Salmonella		●	DW-SP-IM	Vaccination before transfer
ILT		●	DW-ED	2 vaccinations between 6 – 14 weeks
EDS		●	SC-IM	Vaccination before transfer
E. Coli		●	SC-IM	2 vaccinations between 6 – 16 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

AE=Avian encephalomyelitis

CAV=Chicken anemia virus

ILT=Infectious laryngotracheitis

EDS=Egg Drop Syndrome



