



Hubbard
YOUR CHOICE, OUR COMMITMENT

PREMIUM

GUIDE
Parent Stock

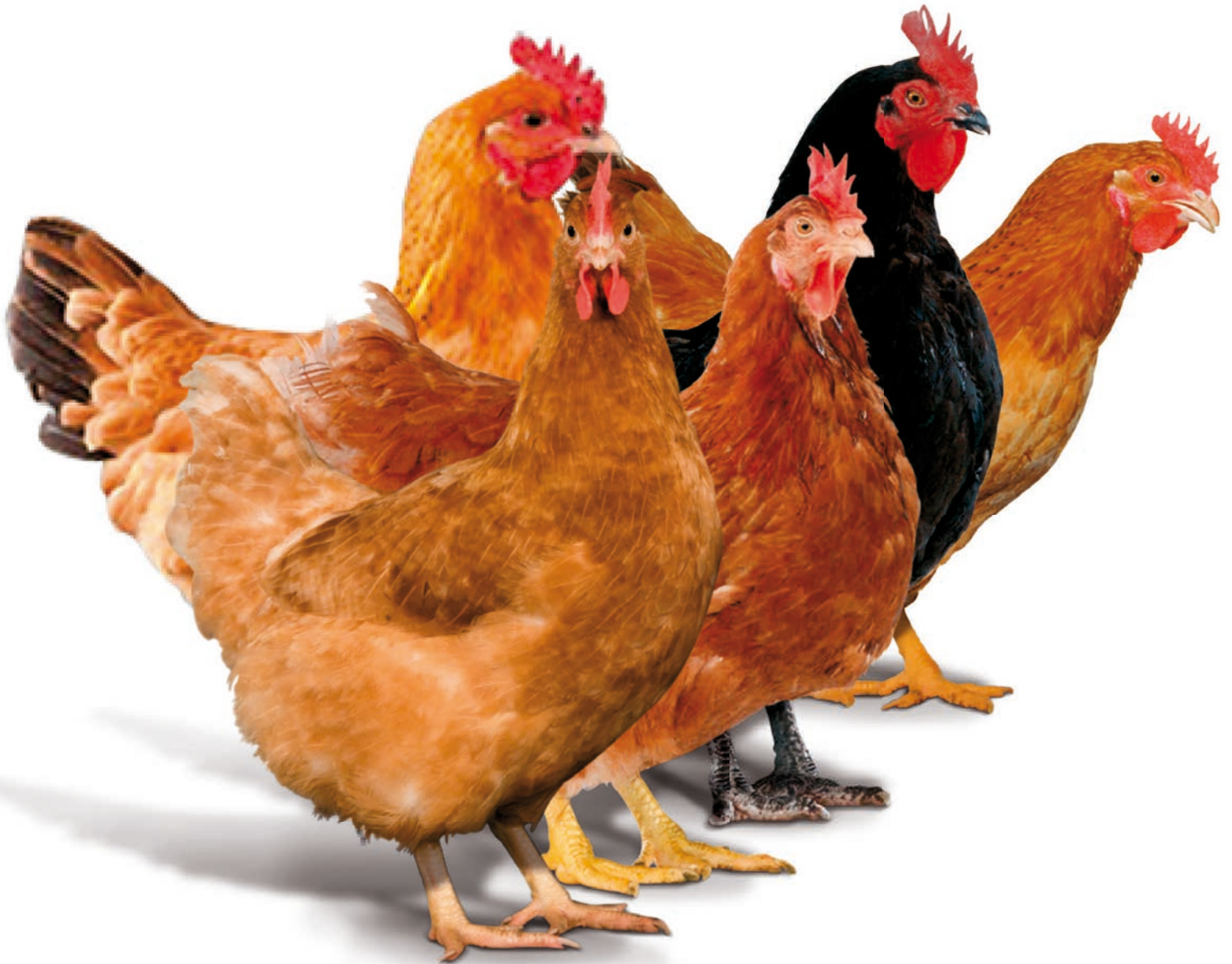


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1. REARING PERIOD FROM 0 TO 24 WEEKS

1.1. CRITICAL POINTS IN REARING

- ✓ Optimum brooding conditions, using a step-down light programme to comply with the bodyweight targets
- ✓ To develop the capacity to eat.
- ✓ Uniform bodyweight: 80% minimum with uniformity of +/- 10% or CV = 8%
- ✓ To monitor the sexual maturity to prevent an earlier onset of lay (effect of both bodyweight and lighting program)
- ✓ To develop the frame size during the first 10-14 weeks. Follow this by controlled growth between 15 weeks and the start of production.

1.2. BODYWEIGHT TARGETS

Weigh birds every week from the first week of age; collective weights the first two weeks and individual bodyweights thereafter.

Take a good sample (around 100 birds) from each pen.

Note: Weigh every bird in the catching pen to record data which reflects the flock's bodyweight.

Age (Days)	JAK - JAK - JAKi - P6N	JA87	REDBRO M
21	300 g	300 g	300 g
70	950 g	950 g	950 g
112	1 365 g	1 395 g	1 395 g
140	1 585 g	1 720 g	1 720 g

1.3. MAIN POINTS TO ACHIEVE PROPER BODYWEIGHT WITH GOOD UNIFORMITY

Optimum brooding conditions, with slow step down light program (reach 12 hours of light at around 5- 6 weeks of age). If the early growth is not sufficient, decrease the light more slowly and reach 12 hours of lights few weeks later.

DARK REARING HOUSE AND DARK PRODUCTION HOUSE

Age (Days)	Day lenght*	Light intensity (lux)**	Feed / day ***	Temperature (°C) / (°F)			Humidity	
				Using brooders (1 / 500 chicks)				Whole house heating
				Under brooders	Living area	"Cold" area		
0	24 h	60	Ad Libitum (1 - 21d)	34 – 35	28	22 – 23	31 – 32	50 – 60 %
1	22 h	60		34 – 35	28	22 – 23	30 – 31	50 – 60 %
2	22 h	60		34 – 35	28	22 – 23	29 – 30	50 – 60 %
3	20 h	40		34 – 35	27	22 – 23	28 – 29	50 – 60 %
4	20 h	30		31 – 33	26	22 – 23	28 – 29	50 – 60 %
5	18 h	20		31 – 33	25	22 – 23	26 – 27	50 – 60 %
6	18 h	15		31 – 33	25	22 – 23	26 – 27	50 – 60 %
7	16 h	10		27 – 28	22 – 23		24 – 25	50 – 60 %
8	16 h	5 - 10	27 – 28	22 – 23		24 – 25	50 – 60 %	
9	16 h	5 - 10	27 – 28	22 – 23		24 – 25	50 – 60 %	
10 - 14	16 h	5 - 10	40g (4w)	27 – 28	21 – 22		24 – 25	50 – 60 %
15 - 28	14 h	5 - 10	/42 g (5w)	25 – 28	18 – 20		23 – 24	50 – 60 %
29 - 42	12 h	5 - 10	/46 g (6w)		18 – 20			50 – 60 %

FEEDING

- Brooding (0 – 21 days): stimulate the appetite during the first 10 days by emptying the feeders of feed at least twice weekly. Use crumble feed.
- 28 – 35 days: change to the 6/7 feed programme according to the clean-up time which should not be more than 8 hours.
- Then, as soon as possible, between 7 - 10 weeks, change to the 5/7 feed programme until the start of lay. This helps to develop crop capacity and improve uniformity.
- Note: If bodyweight at 8 weeks is below target continue with the starter feed.

1.1. EQUIPMENT AND STOCKING DENSITY

Linear trough feeder:	12-14 cm/bird
Pan feeding system: Round:	1/12-14 birds
Oval:	1/14-16 birds
Bell drinkers:	1/80 birds
Nipple drinkers:	1/10 birds
Feed distribution time:	4 - 6 min
Stocking density	9-10 females/m ² (moderate climate) 8 females/m ² (hot climate)

It is crucial to observe the flock eating behaviour to be sure that both feed and water distribution is correct.

1.2. WATER RESTRICTION

On days with feed: stop water 2 hours after the end of the feed clean-up.

On days with no feed: minimum of 2 hours and more if it is too hot.

Check the crop before stopping the water; it should be soft.

Regularly check the chemical and bacteriological quality of the drinking water.

1.3. GRAIN AND GRIT

To promote an aggressive flock feeding behaviour, general activity, litter scratching and to occupy the flock on fasting days, distribute on the litter:

- 3 g of grit/week/bird distributed on two days.
- 3 g of grain/bird twice a week.

1.4. PERCHES

Provide 3 cm of perch space/pullet from the 4th week to train the pullets to jump up to the nests and to help prevent floor eggs.

Perches are recommended, especially when the equipment does not allow any other way of perching; pan feeders, nipple drinkers, etc.

1.5. BEAK TRIMMING

To be considered according to the prevailing legislation in the country.

For females to be housed:

- in open-side houses
- in areas of high light intensity
- under high stocking density

Beak-trimming is recommended between 7 and 10 days or on the hatch day at the hatchery.

Beak trimming between 8 and 12 weeks of age will give added security in areas or periods of very high light intensity

2. LIGHTING PROGRAM

TARGET: 5% LAY AT 23 WEEKS. NO STIMULATION BEFORE 148 DAYS.

Rearing house	Non-dark or semi-open						Dark		
Production house	Non-dark						Non-dark	Dark	
Age (days)	Duration of the natural day at 20 weeks						Duration of light		
	< 10h	11h	12h	13h	14h	> 15h	Hours	Ages	Hours
1 - 2	22	22	22	22	22	22	22	1 - 2	22
3 - 4	20	20	20	20	20	20	20	3 - 4	20
5 - 6	18	18	18	18	18	18	18	5 - 6	18
7 - 14	16	16	16	16	16	16	16	7 - 14	16
15 - 28	14	14	14	14	14	14	14	15 - 28	14
29 - 42	12	12	12	12	12	12	12	29 - 42	12
Decreasing day length								43 - 49	12
43 - 148	Duration of natural day at 21 weeks (min.:12h)						50 - 140		12
Transfer								141 - 147	12
148	+ 1 hour / week (max.: 17h)						148 - 154		13
Increasing day length								155 - 161	14
43 - 148	Duration of the natural day at 21 weeks (min.: 12h – max.: 15h)						162 - 168		15
Transfer								169 - 175	16
148	+ ½ hour / week (max.: 17h)						+ 175		16

A slower decreasing lighting program may be applied if the female growth is inadequate. This can also help to improve the control of sexual maturity.

N.B.: The sexual maturity of the pullets should match that of the males. If necessary and achievable, the males can be light stimulated before the pullets.

LIGHT INTENSITY

- During rearing:
 - In a dark house: 1 to 7 days = 40/60 lux (5 W/m² incandescent light). Gradually decrease to 5 - 10 lux or (0.5 - 1 W/m²) at 6 weeks
 - In a non-dark house and with increasing day length, keep intensity at 10 - 20 lux after the start.
- During production:
 - Dark house: Minimum 30 lux
 - Non-dark house: preferably the additional light period should be provided in the morning with an intensity of 40/60 lux.

N.B.: Do not lower the light intensity between the rearing house and the production house.

Depending on the target age to start production and the rearing conditions (climatic region, house, etc.), the light program can be adapted with the help of your local technician.

TRANSFER TO THE PRODUCTION HOUSE

If sexual maturity is well managed, transfer can be made at 140 days during decreasing day length and 147 days during increasing day length. If the pullets are too mature, feed restriction remains the only technique left to block further increases in sexual maturity. In this case, it is best to do it before 2 % daily production.

3. PRODUCTION PERIOD (22 - 65 WEEKS)

3.1. CRITICAL POINTS IN PRODUCTION

- ✓ Light stimulation should be between 148 and 154 days to achieve 5% average production at 23 weeks.
- ✓ Reach the maximum feed intake by 60% daily production.
- ✓ It is crucial to leave the feeders empty for at least 2 to 3 hours in the middle of each day to keep the females with a good appetite.
- ✓ The use of the “onset of lay” feed with a high level of linoleic and sulphur amino acids will help to secure good early egg size increases, especially in a hot climate.
- ✓ If using slats, the height should not exceed 35-40 cm.
- ✓ The grill size to be used should be 43 mm wide and 55 mm high.

3.2. PEAK OF PRODUCTION

To achieve a good peak of production it is recommended to:

- Apply an effective light programme
- Maintain good uniformity. Assure that the feed distribution is correctly by using the relevant equipment:

	Temperate climate		Hot climate
	All litter	¾ litter + ¼ slats	
Density	7 hens/available m ² - 1.53 ft ² /bird	8 hens/available m ² - 1.34 ft ² /bird	6 hens/available m ² - 1.79 ft ² /bird
Feeders :			
- trough	12 - 14 cm (4.5 - 5.5 in) feeder space per bird / 6 - 7 m (20 - 23 ft) length for 100 birds	12 - 14 cm (4.5 - 5.5 in) feeder space per bird / 6 - 7 m (20 - 23 ft) length for 100 birds	12 - 14 cm (4.5 - 5.5 in) feeder space per bird / 6 - 7 m (20 - 23 ft) length for 100 birds
- round pans (ø35 cm - 13.8in)	1 for 12 - 14 hens	1 for 12 - 14 hens	1 for 12 - 14 hens
oval pans	1 for 14 - 16 hens	1 for 14 - 16 hens	1 for 14 - 16 hens
Drinkers :			
- round	1 for 80 hens	1 for 80 hens	1 for 80 hens
- nipples (flow 90 -120 ml/mn minimum)	1 for 6 to 8 hens	1 for 6 to 8 hens	1 for 6 to 8 hens
Feed distribution time	4 min	4 min	4 min
Nests	1 manual nest /4 hens or 80 - 90 hens/linear meter (3.28ft) of automatic nest	1 manual nest /4 hens or 80 - 90 hens/linear meter (3.28ft) of automatic nest	1 manual nest /4 hens or 80 - 90 hens/linear meter (3.28ft) of automatic nest
Ventilation capacity	5 m ³ /Kg (80 ft ² /lb) live weight/hour	5 m ³ /Kg (80 ft ² /lb) live weight/hour	8 m ³ /Kg (80 ft ² /lb) live weight/hour or 3 m/s air speed
Light intensity	40-60 lux	40-60 lux	40-60lux

* We do not recommend the use of slats covering more than 25-30 % of the living area. Slat height above the floor should not exceed 40cm / 16 inches.

Maintain the same feed programme that was used during rearing (5/7), which will help to control the age at start of lay.

FROM 5% TO PEAK PRODUCTION FEED DAILY

Objective: To stimulate the appetite using a mash feed with the following characteristics.

- Particle size:
 - < 0.5 mm = 15 %
 - 3.15 mm = 5 %

Feed presentation in crumble form is not ideal, unless it is made from a course grind the same as for a mash feed, which reduces the percentage of fines. During hot weather the particle size can be larger, with 10 - 15 % of the particles being greater than 3.15mm. 70% of the total calcium level of the feed should be of a 3.5 mm particle size.

DISTRIBUTION TIME

Whatever the level of feed intake, it is important to leave the feeders empty for at least 2 to 3 hours each day, preferably in the middle of the day.

If the feed system is not empty, reduce the feed intake to respect this empty period, but do not increase the number of times that the feed system distributes the feed.

DURING HOT WEATHER TO STIMULATE FEED CONSUMPTION

- Change to the hot weather feed formula.
- Increase the particle size of the feed.
- Turn on the lights in the middle of the dark (sleeping) period for 1 to 2 hours.
- Add vitamin C (500 g/ton or 1 g/ liter of water).

INCREASE FEED ACCORDING TO THE PRODUCTION LEVEL

- As production increases
 - Regular weight gain between 20 and 28 weeks.
 - Egg weight should regularly increase (please see enclosed the daily egg weight graph).
 - Production should increase by at least 5 %/day.
- We advise:
 - Weighing the females weekly
 - Weighing 100 - 150 eggs daily
 - Calculating the daily level of production.

If any of the above factors increase slowly or become stable, in particular the egg weight, this suggests that feed consumption is insufficient to cover the requirements.

Corrective measures should be taken quickly. Check the feed formulation, presentation and distribution.

From 5% daily production, the progressive increase of feed allows for the correct increases in bodyweight, egg weight and production.

The objective is to reach the maximum feed intake by 60% daily production.

3.3. PERSISTENCY

FEED AFTER THE PEAK

Objectives:

- To control bodyweight increase.
- To control egg weight increase.

At 30 weeks, if egg weight is above 57 g, the feed intake should be reduced by 0.5 to 1 g/week.

Regularly check the feed distribution.

BROODINESS

This is mainly caused by a failure to meet the nutritional requirements. If this happens before peak production the origin is likely due to:

- Feed problem (formulation, presentation or distribution) combined with insufficient feed intake.
- Insufficient water consumption
- Management (temperature, ventilation, etc.).
- Parasites.

Daily check for the non-laying birds' right from the peak of lay. Isolate broody hens in a pen with water and feed for one week or in cages (or crates) for 48h with no feed and no water. Please read our Technical Bulletin "Broodiness".

FLOOR EGG MANAGEMENT

Some factors that can influence floor eggs:

- Correct number and design of the nests
- Encourage access to the nests
- Ensure good distribution of equipment
- Control water and feed to the flocks. Check the feed distribution and maintain the correct water level in the drinkers.
- Avoid male aggressiveness
- Manage floor laying from the start of production and collect eggs frequently
- Slat height: 35 - 40 cm. Maximum area: 25-30% of the total floor space.

4. MALE MANAGEMENT

The mini-type female responds quickly to light stimulation. It is therefore necessary to take into account any difference in sexual maturity between the sexes, which will depend on the type of male being used:

- Fast growing males: M77 or M99.
- Intermediate growing males: Redbro, Redbro naked neck, Master Grey, Grey Barred, Grey Barred naked neck, Color Pac, Color Yield, Tricolor, etc.
- Slow growing males: S 66, S 77, I 66, S 88 and S 77N.

Refer to the Management Guide for the growth curve of the particular male that is being used.

If required males can be light stimulated ahead of the females.

4.1. REARING PERIOD : 3 STEPS

Rearing period: 3 steps

STEP 1: 1 DAY TO 10 WEEKS – GROWTH AND UNIFORMITY

- Good frame development
- Crumble feed for the first 3 weeks
- Good brooding conditions
- Grading at 4 - 5 weeks
- Fractionated feeding from 4 weeks (5/7)
- Careful beak trimming at 7 days (possible also at day old)

STEP 2: 10 TO 15 WEEKS – CONSISTENT GROWTH

STEP 3: 15 TO 21 – 23 WEEKS – TESTICLE DEVELOPMENT

- Bodyweight must not stall in this period to prevent future fertility issues

4.2. EQUIPMENT

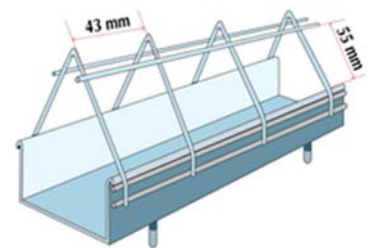
	REARING	PRODUCTION
Density	4 males/m ²	
Linear troughs	1/8-10 males	1/8-10 males
Pan feeders	15-20 cm/male	20 cm/male
Round drinkers	1/80 males	1/70 males
Nipple drinkers (90 - 120 ml/min)	1/10 males	1/8 males
Distribution time	4 min	4 min

4.3. PRODUCTION PERIOD

21 TO 25/26 WEEKS

This period is crucial to establish a good relationship between males and females. Careful monitoring of the bodyweight and correct percentage of males mixed with the females is necessary to obtain good fertility and male behaviour.

- Never transfer shy, immature males
- Transfer males a few days before the females if possible. Progressive mixing is ideal up to 26 - 27 weeks of age. Remove cull males and keep only 8 - 10% males after 27 weeks, according to the type of males being used.
- Until 26 – 27 weeks the risk of excessive weight gain is high, so :
 - Grill size is important to reduce male access to the female feeder (43X55 mm). The use of a tube inside the grill could prevent males stealing female feed during the weeks after transfer.
 - Adjust male feed amounts to comply with the bodyweight objectives
 - Feed males and females at the same time
 - Weigh males weekly
 - To stop males eating with the females , the female feeding system must be fitted with grills adapted to the female body characteristics.
 - The few points on the circuit without grills (corners for instance) should be sealed with covers.



AFTER 26 WEEKS

- Male bodyweight gain should be regular. If bodyweights are non-fasted, add 6% to the fasted target bodyweight.
- Observation of the males is crucial to evaluate their condition.
- A special male high fibre (6 - 8%) mash feed is recommended.

4.4. SPIKING

To obtain the best persistency of fertility at the end of production, between 38 and 45 weeks, it may be useful to replace 10 - 30 % of the males by younger ones weighing at least 3 500 g.

5. MALE/FEMALE BEHAVIOR MANAGEMENT

In specific cases (high light intensity, high density, poor equipment, overweight males or too many males, heavy females, etc.), males can become aggressive towards the females. This can cause damage (scratches / skin tears) to the females during mating and provoke pecking issues between birds. To prevent this kind of behaviour we advise:

- Male beak trimming at day old or 7 days. Check the male beaks before mixing and re-trim the sharp beaks if needed.
- Good control of the male bodyweight both in the rearing and production period and maintain good uniformity.
- Prevent over mating.
- Use a high fibre diet in order to calm males.
- De-toeing of toes 3, 4, 5 and 6 of the male day-old chicks can also be a good way to prevent these issues.
- In cases of too much mortality due to injured females, we recommend to quickly implement both a new beak trimming and to cut the nails of toe 3 and 6 of the males.

In some cases, pecking issues occur between females and this is often due to insufficient feed space or poor feed distribution and equipment, high density, etc. High light intensity can also contribute to this behaviour. Once again, in some specific cases, it is recommended to beak trim females at 7 days or day old.

Female parent stock target daily allocation at peak production

Amino-acids (mg/bird/day)			Ideal Protein	Metabolisable energy intake (Kcal or MJ /bird/day)							
	Tot.	Dig.		Temperature °C	15.0	17.5	20.0	22.5	> 25,0 (1)		
Lysine (2)	925	825	100	°F	59.0	63.5	68.0	72.5	> 77,0 (1)		
Methionine	475	425	52	JA57 & P6N	Kcal	360	347	335	325	315 to 335	
Meth. & Cystine	815	725	88		MJ	1.51	1.45	1.40	1.36	1,32 to 1,40	
Valine	805	700	85	JA87 & RBM	Kcal	385	372	360	350	340 to 360	
Isoleucine	740	645	78		MJ	1.61	1.56	1.51	1.46	1,42 to 1,51	
Arginine (2)	1 065	895	108	Feed intake (g/bird/day)							
Tryptophan	240	195	24	Temperature °C	15.0	17.5	20.0	22.5	> 25,0		
Threonine	675	580	70	°F	59.0	63.5	68.0	72.5	> 77,0		
Minerals (mg/bird/day)				ME level in feed	2700 Kcal/kg	JA57 & P6N	133	129	124	120	117 to 124
	Min.	Max.				JA87 & RBM	143	138	133	130	126 to 133
Calcium	4 000	4 200		2800 Kcal/kg	JA57 & P6N	129	124	120	116	113 to 120	
Av. phosphorus	490	510			JA87 & RBM	138	133	129	125	121 to 129	

(1) The additional energy demands to dissipate heat will vary with bodyweight, feed intake, feed composition (Oil content), feathering, activity and environmental management.

(2) The arginine / lysine ratio can be increased to 110 % in hot conditions.

6. NUTRITION

6.1. NUTRIENT RECOMMENDATIONS: G/KG PER 1000 KCAL (MCAL) OF METABOLISABLE ENERGY – FLOOR SYSTEM

PHASE	PRE-STARTER		STARTER		PULLET		TRANSITION		ONSET OF LAY		BREEDER I		BREEDER II		MALE	
Age fed (days)	0 to 28/35		28/35 to 56/70		56 /70 to 133/154		Optional 133 to 1% lay		Optional 1% to 58g egg weight		1%/58g to 60g egg weight		60g egg weight to cull		Optional 134 to cull	
Suggested kcal	2 800 - 3 000		2 750 - 2 900		2 400 - 2 900		2 600 - 2 900		2 650 - 2 900		2 650 - 2 900		2 650 - 2 900		2 400 - 2 900	
ME per Kg MJ	11.70 - 12.50		11.50 - 12.10		10.00 - 12.10		10.90 - 12.10		11.10 - 12.10		11.10 - 12.10		11.10 - 12.10		10.00 - 12.10	
Min. amino-acids	Tot.	Dig.	Tot.	Dig.	Tot.	Dig.	Tot.	Dig.	Tot.	Dig.	Tot.	Dig.	Tot.	Dig.	Tot.	Dig.
Lysine	3.80	3.39	3.71	3.32	2.59	2.26	2.62	2.31	2.87	2.55	2.77	2.47	2.71	2.42	2.45	2.14
Methionine	1.60	1.45	1.55	1.40	1.24	1.08	1.25	1.10	1.46	1.32	1.41	1.27	1.37	1.23	1.17	1.02
Meth. & Cystine	2.90	2.58	2.80	2.50	2.16	1.88	2.18	1.92	2.54	2.26	2.43	2.16	2.38	2.12	2.04	1.78
Valine	2.61	2.30	2.55	2.22	2.00	1.70	2.04	1.73	2.45	2.15	2.40	2.09	2.35	2.05	1.89	1.61
Isoleucine	2.55	2.25	2.50	2.21	1.96	1.68	2.00	1.71	2.28	1.98	2.21	1.93	2.16	1.89	1.85	1.59
Arginine	4.00	3.58	3.81	3.42	2.70	2.30	2.70	2.30	3.32	2.82	3.18	2.68	3.11	2.62	2.55	2.17
Tryptophan	0.75	0.64	0.73	0.62	0.61	0.51	0.62	0.52	0.72	0.60	0.71	0.59	0.70	0.58	0.58	0.48
Threonine	2.58	2.25	2.55	2.22	1.85	1.57	1.86	1.58	2.08	1.79	2.01	1.73	1.97	1.70	1.75	1.48
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Crude protein (1)	65.00	69.00	64.00	68.00	54.00	56.00	54.50	56.50	61.00	63.00	60.00	62.00	57.00	60.00	48.00	51.00
Calcium	3.60	3.80	3.60	3.70	3.30	3.50	4.50	5.50	11.80	12.25	11.80	12.25	12.50	13.50	3.30	3.50
Av. Phosphorus	1.60	1.70	1.50	1.60	1.40	1.50	1.40	1.50	1.45	1.50	1.45	1.50	1.30	1.40	1.40	1.55
Sodium	0.60	0.75	0.58	0.70	0.55	0.70	0.55	0.70	0.60	0.70	0.60	0.70	0.60	0.70	0.55	0.75
Chloride	0.60	0.85	0.60	0.80	0.60	0.80	0.60	0.80	0.60	0.80	0.60	0.80	0.60	0.80	0.60	0.80

1) The progress made in raw material analysis and digestible amino acid evaluation should avoid unnecessary protein excess, which can be the cause of excessive muscle deposition, poor litter quality and low hatchability..

6.2. 6.2. EXAMPLE OF DIET SPECIFICATIONS FOR TEMPERATE CLIMATES

PHASE	PRE-STARTER		STARTER		PULLET		TRANSITION		BREEDER I		BREEDER II		MALE	
Age (days)	0 to 28		29 to 56		56 to 133		134 to 1% lay		1% to 60g egg weight		60g egg weight to cull		134 to cull	
ME kcal/kg	2 850		2 750		2 600		2 675		2 750		2 730		2 650	
MJ/kg	11.90		11.50		10.90		11.20		11.50		11.30		11.10	
Min. amino-acids	Tot.	Dig.	Tot.	Dig.	Tot.	Dig.	Tot.	Dig.	Tot.	Dig.	Tot.	Dig.	Tot.	Dig.
Lysine %	1.08	0.97	1.02	0.91	0.67	0.59	0.70	0.62	0.76	0.68	0.74	0.66	0.65	0.57
Methionine %	0.46	0.41	0.43	0.39	0.32	0.28	0.34	0.29	0.39	0.35	0.37	0.33	0.31	0.27
Meth. and Cyst. %	0.83	0.74	0.77	0.69	0.56	0.49	0.58	0.51	0.67	0.59	0.65	0.58	0.54	0.47
Valine %	0.74	0.66	0.70	0.61	0.52	0.44	0.55	0.46	0.66	0.57	0.64	0.56	0.50	0.43
Isoleucine %	0.73	0.64	0.69	0.61	0.51	0.44	0.53	0.46	0.61	0.53	0.59	0.52	0.49	0.42
Arginine %	1.14	1.02	1.05	0.94	0.70	0.60	0.72	0.62	0.87	0.74	0.85	0.72	0.68	0.58
Tryptophan %	0.21	0.18	0.20	0.17	0.16	0.13	0.17	0.14	0.20	0.16	0.19	0.16	0.15	0.13
Threonine %	0.74	0.64	0.70	0.61	0.48	0.41	0.50	0.42	0.55	0.48	0.54	0.46	0.46	0.39
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Crude protein %	18.00	19.00	18.00	19.00	14.00	14.50	15.00	15.50	16.00	16.50	15.50	16.00	13.00	13.50
Crude fiber %	2.50	3.50	2.50	3.50	3.50	8.00	3.00	6.00	3.50	6.00	4.00	6.50	3.50	7.00
Calcium %	1.00	1.05	1.00	1.05	0.90	0.95	1.25	1.50	3.10	3.30	3.30	3.40	0.90	0.95
Av. Phosphorus %	0.45	0.50	0.45	0.50	0.37	0.40	0.39	0.41	0.41	0.42	0.36	0.39	0.37	0.41
Sodium %	0.16	0.20	0.16	0.20	0.15	0.18	0.15	0.18	0.16	0.18	0.16	0.18	0.15	0.18
Chloride %	0.18	0.22	0.18	0.22	0.16	0.20	0.16	0.20	0.16	0.20	0.16	0.20	0.16	0.20
Potassium %	0.70	0.75	0.70	0.75	0.55	0.70	0.60	0.75	0.60	0.75	0.55	0.70	0.55	0.70
Crude fat %	3.50	4.00	3.50	4.00	2.50	4.00	3.00	4.00	3.00	4.00	3.00	3.50	2.50	4.00
Linoleic acid %	1.20	1.60	1.20	1.60	1.00	1.30	1.30	1.60	1.50	1.70	1.20	1.40	1.30	1.70

6.3. 6.3. EXAMPLE OF DIET SPECIFICATIONS FOR A HOT CLIMATE (>25°C) ON CORN SOJA DIETS
– FLOOR SYSTEM

PHASE	PRE-STARTER		STARTER		PULLET		TRANSITION		ONSET OF LAY		BREEDER I		BREEDER II		MALE	
Age (days)	0 to 35		36 to 70		70 to 133		134 to 1% lay		1% lay to 58g egg weight		58 to 60g egg weight		60g egg weight to cull		134 to cull	
ME - Floor Kcal/kg	2 850		2 750		2 650		2 750		2 825		2 800		2 775		2 650	
MJ/kg	11.90		11.50		11.10		11.50		11.80		11.70		11.60		11.10	
Min. amino-acids	Tot.	Dig.	Tot.	Dig.	Tot.	Dig.	Tot.	Dig.	Tot.	Dig.	Tot.	Dig.	Tot.	Dig.	Tot.	Dig.
Lysine %	1.08	0.97	1.02	0.91	0.69	0.60	0.72	0.63	0.81	0.72	0.77	0.69	0.75	0.67	0.65	0.57
Methionine %	0.46	0.41	0.43	0.39	0.33	0.29	0.34	0.30	0.41	0.37	0.40	0.35	0.38	0.34	0.31	0.27
Meth. and Cyst. %	0.83	0.74	0.77	0.69	0.57	0.50	0.60	0.53	0.72	0.64	0.68	0.61	0.66	0.59	0.54	0.47
Valine %	0.74	0.66	0.70	0.61	0.53	0.45	0.56	0.48	0.69	0.61	0.67	0.58	0.65	0.57	0.50	0.43
Isoleucine %	0.73	0.64	0.69	0.61	0.52	0.45	0.55	0.47	0.64	0.56	0.62	0.54	0.60	0.52	0.49	0.42
Arginine %	1.14	1.02	1.05	0.94	0.72	0.61	0.74	0.63	0.94	0.80	0.89	0.75	0.86	0.73	0.68	0.58
Tryptophan %	0.21	0.18	0.20	0.17	0.16	0.14	0.17	0.14	0.20	0.17	0.20	0.16	0.19	0.16	0.15	0.13
Threonine %	0.74	0.64	0.70	0.61	0.49	0.42	0.51	0.43	0.59	0.51	0.56	0.49	0.55	0.47	0.46	0.39
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Crude protein %	18.00	19.00	18.00	19.00	14.50	15.00	15.00	15.50	16.75	17.25	16.50	17.00	16.00	16.50	13.00	13.50
Crude fiber %	2.50	3.50	2.50	3.50	3.50	8.00	3.00	6.00	3.00	6.00	3.00	6.00	3.50	6.50	3.50	6.50
Calcium %	1.00	1.05	1.00	1.05	0.90	0.95	1.25	1.50	3.10	3.30	3.20	3.40	3.40	3.60	0.90	0.95
Av. Phosphorus %	0.46	0.48	0.41	0.44	0.37	0.40	0.39	0.41	0.41	0.42	0.41	0.42	0.36	0.39	0.37	0.41
Sodium %	0.16	0.20	0.16	0.20	0.16	0.20	0.16	0.20	0.16	0.20	0.16	0.20	0.16	0.20	0.16	0.20
Chloride %	0.18	0.22	0.18	0.22	0.16	0.22	0.16	0.22	0.16	0.22	0.16	0.22	0.16	0.22	0.16	0.22
Potassium %	0.65	0.75	0.65	0.75	0.55	0.70	0.55	0.75	0.60	0.75	0.60	0.75	0.55	0.70	0.55	0.70
Crude fat %	3.00	4.00	3.00	4.00	2.50	4.00	3.00	4.00	4.50	5.00	4.00	4.50	3.50	4.00	2.50	4.00
Linoleic acid %	1.20	1.60	1.20	1.60	1.00	1.30	1.40	1.70	1.90	2.10	1.60	1.80	1.30	1.50	1.30	1.70

OTHER HUBBARD TECHNICAL DOCUMENTS

BREEDER MANUAL

BREEDER PERFORMANCE SUMMARY

MALE PERFORMANCE SUMMARY

INCUBATION GUIDE

NUTRITION GUIDE

OTHER SPECIFIC TECHNICAL DOCUMENTS

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