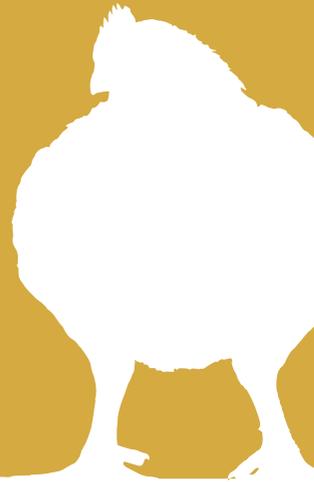


GENERAL NUTRITION RECOMMENDATIONS



**REDBRO FEMALE
AND MALES
PARENT STOCK**



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INTRODUCTION

This document provides general nutrition recommendations and some practical adaptations to specific situations. The optimum nutritional programme will vary according to local conditions such as:

- ▷ ingredients availability and ingredient economics;
- ▷ feed intake, climate;
- ▷ housing type;
- ▷ disease status.

It is very important to remember that growth and egg production are all driven by nutrient intake measured in mg, g or unit of energy per day. The following formula is key to achieving target nutrient intake needed at each stage of rearing or production:

$$\text{Nutrient intake (g or kcal / d)} = \text{Feed Intake (g / d)} \times \text{Nutrient in the feed (\% or kcal)}$$



1. NUTRIENT RECOMMENDATIONS FOR FEMALES: KEY POINTS

► Rearing period

- ▷ Achieving the bodyweight targets at 4 and 6 weeks of age is important for both the REDBRO parent female and for parent males.
- ▷ The use of both **Pre-Starter and Starter** diets in this period may be necessary to ensure this objective is met. If these body weights targets are not achieved or historically have been difficult to achieve then use the **Pre-Starter and Starter** diets for a longer period.
- ▷ Avoid overfeeding protein after 8 weeks of age where possible especially if bodyweight is on or over target.
- ▷ While it may be possible to use diets designed for Conventional parent females for REDBRO females in the rearing period, it is best to check their suitability with your Hubbard Technical Specialist.

Ensure the correct performance objectives are being used for the parent males if M77 or M99 are being used as these are adapted when used with Premium females.

► Production period

- ▷ It is normal to feed the Grower diet until 1% production. Transition diet is not normally used as this may risk extra growth before stimulation and too early sexual maturity. Transition diet is only recommended when bodyweights of females are below target at 16 - 18 weeks of age and extra feed is needed to boost growth.
- ▷ The Breeder III diet shown here is an optional diet only to be used in exceptional circumstances. The objective of this diet is to help control egg size in situations after 350 days where egg size exceeds the performance objective by 3 g according to the age of the flock.
- ▷ These recommendations are specific for REDBRO parent females. If logistics makes it difficult to meet these recommendations due to other breeds (Conventional or Premium) being kept on the same farm or due to feed mill constraints then please contact your Hubbard Technical Specialist for advice before using diets produced for other breeds (to assess the risk undersupplying nutrients especially amino acids and minerals).

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[Management guide
REDBRO PS](#)

[Nutrition recommendations
Premium Mini PS](#)

1. NUTRIENT RECOMMENDATIONS FOR FEMALES: FEMALE PARENT STOCK TARGET DAILY NUTRIENT ALLOCATION AT PEAK

Table 1 provides some key data for the critical period at peak production that impacts nutrition during the production period.

- Daily nutrient intakes recommended to achieve or exceed the performance objectives at peak daily egg production for the REDBRO female. → See Performance Objectives.
- Data for amino acids are provided as either total or digestible amino acids. The optimal recommended amino acid balance on an ideal protein basis is also shown.
- Minimum target intakes for Calcium and Available Phosphorus. Available Phosphorus is still the most widely used basis for Phosphorus nutrition across the world for breeders. Adapted recommendations for digestible Phosphorus systems are available by contacting Hubbard Nutritionists.
- Estimates of the expected Metabolisable Energy (ME) intake per day are shown and are adjusted according to average daily temperature in the house which will affect ME requirements.

➤ CALCULATIONS

- Once the ME content of the Breeder diet is known, it is possible to estimate the expected daily peak feed intake.

$$\frac{440 \text{ kcal (ME intake)} / 2750 \text{ kcal / kg (ME of the feed)}}{160 \text{ g feed / d (Feed intake)}}$$

- Using the predicted feed intake and the target intakes for all nutrients it is possible to calculate the % of each nutrient needed in the diet. If birds experience heat stress, then the additional demands to use energy to dissipate heat may increase ME requirements. The precise amount of energy is not easy to predict.

- In addition, if bodyweight exceeds the target, then the maintenance ME requirement will be increased. As a guide, for each 100 g over the bodyweight target, the ME requirement increases by 10 kcal day or 0.05 MJ / d.



TABLE 1: FEMALE PARENT STOCK TARGET DAILY ALLOCATION AT PEAK

Amino acids (mg / bird / day)			Ideal Protein	Minerals (mg / bird / day)		
	Tot.	Dig.			Min.	Max.
Lysine	1067	967	100	Calcium	5000	5400
Methionine	620	556	58	Av. Phosphorus	630	680
Meth. & Cystine	1039	935	97			
Valine	1068	947	98			
Isoleucine	850	754	78			
Arginine	1174	1044	108			
Tryptophan	263	232	24			
Threonine	861	764	79			

Metabolisable energy intake (kcal or MJ / bird / day)

Temperature	°C	15.0	17.5	20.0	22.5	25.0	> 25.0
	°F	59.0	63.5	68.0	72.5	77.0	> 77.0
ME intake	kcal	470	455	440	430	420	420 to 445
	MJ	2.09	1.90	1.84	1.80	1.76	1.74 to 1.86

Feed intake (g / bird / day)

ME level in feed	2750 kcal / kg	171	165	160	156	153	153 to 163
	2850 kcal / kg	165	160	154	151	147	147 to 156



➤ METABOLISABLE ENERGY

- The recommendations in this guide are in accordance with the WPSA (1999) ME content of feed ingredients.
- It is important to note that there are differences between various international databases that describe the ME content of feed ingredients. This causes much discussion and makes direct comparisons of diets or recommendations difficult unless they are made using the same database.
- Target ME intakes may vary between countries based on many factors so what is optimal in one location may not be the same elsewhere.

1. NUTRIENT RECOMMENDATIONS FOR FEMALES: GENERAL NUTRIENT RECOMMENDATIONS (G / KG PER 1000 KCAL OF METABOLISABLE ENERGY)

TABLE 2: BREEDER NUTRIENT RECOMMENDATIONS : G / KG PER 1000 KCAL (MCAL) OF METABOLISABLE ENERGY

PHASE		PRE-STARTER		STARTER		GROWER		TRANSITION		ONSET OF LAY		BREEDER I		BREEDER II		BREEDER III	
Age (days)		Optional 0 to 21 d		0 to 21 d or 42 d		43 d to 126 d or 1% lay		Optional 127 d to 1% lay		Optional 1% lay to 58 g egg weight		1% lay or 58 g egg weight to 280 d or depletion		Optional 281 d to depletion or 350 d		Optional 351d to depletion	
Suggested ME	kcal / kg	2800-3000		2750-2900		2400-2900		2700-2900		2650-2900		2650-2900		2650-2900		2650-2900	
	MJ / kg	11.70-12.50		11.50-12.10		10.00-12.10		11.30-12.10		11.10-12.10		11.10-12.10		11.10-12.10		11.10-12.10	
	kcal / lb	1270-1360		1250-1315		1090-1315		1224-1315		1200-1315		1200-1315		1200-1315		1200-1315	
Min. amino acids		Tot.	Dig.	Tot.	Dig.	Tot.	Dig.	Tot.	Dig.	Tot.	Dig.	Tot.	Dig.	Tot.	Dig.	Tot.	Dig.
Lysine		3.80	3.40	3.02	2.72	2.56	2.21	2.25	2.00	2.51	2.27	2.42	2.20	2.33	2.10	2.19	1.98
Methionine		1.75	1.59	1.56	1.40	1.24	1.08	1.24	1.08	1.48	1.33	1.41	1.26	1.36	1.21	1.28	1.14
Meth. & Cystine		3.13	2.81	2.84	2.52	2.47	2.15	2.16	1.88	2.50	2.23	2.36	2.12	2.27	2.04	2.13	1.92
Valine		3.11	2.73	2.98	2.62	2.41	2.05	1.95	1.66	2.54	2.22	2.43	2.15	2.32	2.07	2.18	1.95
Isoleucine		2.58	2.28	2.34	2.06	1.96	1.68	1.88	1.61	2.03	1.76	1.93	1.71	1.85	1.64	1.74	1.55
Arginine		4.05	3.65	3.42	3.08	2.69	2.32	2.42	2.09	2.72	2.45	2.67	2.37	2.56	2.28	2.41	2.15
Tryptophan		0.73	0.63	0.70	0.61	0.61	0.51	0.59	0.49	0.65	0.55	0.60	0.53	0.57	0.51	0.53	0.48
Threonine		2.65	2.35	2.45	2.15	2.00	1.70	1.78	1.51	2.08	1.80	1.96	1.74	1.88	1.67	1.82	1.62
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Tot.	Dig.	Tot.	Dig.
Crude protein		64.00	68.00	60.00	64.00	53.00	55.00	50.00	52.00	54.40	56.90	52.70	54.50	49.90	51.70	48.40	50.20
Calcium		3.60	3.80	3.60	3.70	3.30	3.50	4.50	5.50	10.80	11.80	11.30	12.30	12.20	13.30	12.90	13.60
Av. Phosphorus		1.60	1.70	1.50	1.60	1.40	1.50	1.40	1.50	1.42	1.52	1.40	1.50	1.30	1.40	1.25	1.35
Sodium		0.60	0.70	0.58	0.70	0.55	0.70	0.55	0.70	0.55	0.70	0.55	0.70	0.60	0.70	0.60	0.70
Chloride		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	0.60	0.80
Potassium		2.30	2.80	2.30	2.80	2.20	2.80	2.20	2.80	2.20	2.80	2.20	2.80	2.20	2.80	2.20	2.80
Linoleic acid		4.10	7.00	4.00	8.00	3.80	8.00	4.40	10.00	6.50	10.00	5.50	10.00	4.50	10.00	4.00	9.00

Table 2 content:

- Examples of the ratio of nutrients per 1000 kcal of ME for all ages. The values that can be used to calculate the nutrient content of the diet according to the local choice of ME level. For example, if an ME of 2800 kcal / kg is the best option for Breeder 1 then the digestible lysine content of the diet can be calculated as: **% Digestible Lysine = (2.20 g dg Lysine / kg x 2800 kcal / kg) / 10000**
- The best way to use this table is as a spreadsheet. The ME content of each diet is shown as a range. The optimal ME content of the diet used locally will depend on many factors but the limits for this choice are shown for each diet. Hubbard Nutritionists can help to determine the optimal local ME content of each diet and from this the percentage of other nutrients can be calculated using Table 2.
- Some diets shown are optional depending on local factors such as chick growth, egg size, low feed intake etc. These choices are discussed in more detail in later sections.

1. NUTRIENT RECOMMENDATIONS FOR FEMALES: EXAMPLES OF NUTRIENT % AND ME CONTENT FOR SPECIFIC SITUATIONS (WHEAT BASED DIETS)

TABLE 3: EXAMPLES OF DIET SPECIFICATION FOR TEMPERATE CLIMATES (WHEAT BASED DIETS)

PHASE		PRE-STARTER		STARTER		GROWER		TRANSITION		BREEDER I		BREEDER II		BREEDER III	
Age (days)		0 to 21 d		21 d to 42 d		43 d to 126 d or 1% lay		Optional 127 d to 1% lay		1% lay to 280 d or depletion		Optional 281 d to depletion or 350 d		Optional 351 d to depletion	
Suggested ME	kcal / kg	2850		2750		2650		2700		2750		2730		2730	
	MJ / kg	11.93		11.51		11.10		11.30		11.51		11.43		11.43	
	kcal / lb	1293		1248		1202		1225		1248		1239		1239	
Min. amino acids		Tot.	Dig.	Tot.	Dig.	Tot.	Dig.	Tot.	Dig.	Tot.	Dig.	Tot.	Dig.	Tot.	Dig.
Lysine %		1.08	0.97	0.83	0.75	0.68	0.59	0.61	0.54	0.67	0.60	0.64	0.57	0.60	0.54
Methionine %		0.50	0.45	0.43	0.39	0.33	0.29	0.33	0.29	0.39	0.35	0.37	0.33	0.35	0.31
Meth. & Cystine %		0.89	0.80	0.78	0.69	0.65	0.57	0.58	0.51	0.65	0.58	0.62	0.56	0.58	0.52
Valine %		0.89	0.78	0.82	0.72	0.64	0.54	0.53	0.45	0.67	0.59	0.63	0.57	0.60	0.53
Isoleucine %		0.74	0.65	0.64	0.57	0.52	0.45	0.51	0.44	0.53	0.47	0.51	0.45	0.48	0.42
Arginine %		1.15	1.04	0.94	0.85	0.71	0.61	0.65	0.56	0.73	0.65	0.70	0.62	0.66	0.59
Tryptophan %		0.21	0.18	0.19	0.17	0.16	0.14	0.16	0.13	0.16	0.14	0.15	0.14	0.15	0.13
Threonine %		0.76	0.67	0.67	0.59	0.53	0.45	0.48	0.41	0.54	0.48	0.51	0.46	0.50	0.44
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Crude protein %		18.2	19.4	16.5	17.6	14.0	14.6	13.5	14.0	14.5	15.0	13.6	14.1	13.2	13.7
Crude fibre %		2.50	3.50	2.50	3.50	3.50	8.00	3.00	6.00	3.50	6.00	4.00	6.50	4.00	6.50
Calcium %		1.03	1.08	0.99	1.02	0.87	0.93	1.22	1.49	3.11	3.38	3.33	3.63	3.52	3.71
Av. Phosphorus %		0.46	0.48	0.41	0.44	0.37	0.40	0.38	0.41	0.39	0.41	0.35	0.38	0.34	0.37
Sodium %		0.17	0.20	0.16	0.19	0.15	0.19	0.15	0.19	0.15	0.19	0.16	0.19	0.16	0.19
Chloride %		0.17	0.23	0.17	0.22	0.16	0.21	0.16	0.22	0.17	0.22	0.16	0.22	0.16	0.22
Potassium %		0.66	0.80	0.63	0.77	0.58	0.74	0.59	0.76	0.61	0.77	0.60	0.76	0.60	0.76
Crude fat %		3.50	4.00	3.50	4.00	2.50	4.00	3.00	7.00	3.00	7.50	3.00	7.50	3.00	7.50
Linoleic acid %		1.17	2.00	1.10	2.20	1.01	2.12	1.19	2.70	1.51	2.75	1.23	2.73	1.09	2.46

Table 3 content:

- ⇒ Example programme of diets to use in a temperate climate where the principal cereal is likely to be wheat and higher ME levels may be expensive to achieve.
- ⇒ Breeder I and Breeder II are usually the only diets used in the production period.
- ⇒ The Breeder III diet shown here is an optional diet only to be used in exceptional circumstances. The objective of this diet is to help control egg size in situations after 350 days where egg size exceeds the performance objective by 3 g according to the age of the flock.

1. NUTRIENT RECOMMENDATIONS FOR FEMALES: EXAMPLES OF NUTRIENT % AND ME CONTENT FOR SPECIFIC SITUATIONS (MAIZE BASED DIETS)

TABLE 4: EXAMPLES OF DIET SPECIFICATION FOR TEMPERATE CLIMATES (MAIZE BASED DIETS)

PHASE		PRE-STARTER		STARTER		GROWER		TRANSITION		BREEDER I		BREEDER II		BREEDER III	
Age (days)		0 to 21 d		21 d to 42 d		43 d to 126 d or 1% lay		Optional 127 d to 1% lay		1% lay to 280 d or depletion		Optional 281 d to depletion or 350 d		Optional 351 d to depletion	
Suggested ME	kcal / kg	2850		2750		2650		2700		2850		2825		2825	
	MJ / kg	11.93		11.51		11.10		11.30		11.93		11.83		11.83	
	kcal / lb	1293		1248		1202		1225		1293		1282		1282	
Min. amino acids		Tot.	Dig.	Tot.	Dig.	Tot.	Dig.	Tot.	Dig.	Tot.	Dig.	Tot.	Dig.	Tot.	Dig.
Lysine %		1.08	0.97	0.83	0.75	0.68	0.59	0.61	0.54	0.69	0.63	0.66	0.59	0.62	0.56
Methionine %		0.50	0.45	0.43	0.39	0.33	0.29	0.33	0.29	0.40	0.36	0.38	0.34	0.36	0.32
Meth. & Cystine %		0.89	0.80	0.78	0.69	0.65	0.57	0.58	0.51	0.67	0.61	0.64	0.58	0.60	0.54
Valine %		0.89	0.78	0.82	0.72	0.64	0.54	0.53	0.45	0.69	0.61	0.66	0.59	0.62	0.55
Isoleucine %		0.74	0.65	0.64	0.57	0.52	0.45	0.51	0.44	0.55	0.49	0.52	0.46	0.49	0.44
Arginine %		1.15	1.04	0.94	0.85	0.71	0.61	0.67	0.59	0.76	0.69	0.72	0.65	0.68	0.61
Tryptophan %		0.21	0.18	0.19	0.17	0.16	0.14	0.16	0.13	0.17	0.15	0.16	0.14	0.15	0.13
Threonine %		0.76	0.67	0.67	0.59	0.53	0.45	0.48	0.41	0.56	0.49	0.53	0.47	0.51	0.46
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Crude protein %		18.2	19.4	16.5	17.6	14.0	14.6	13.5	14.0	15.0	15.5	14.1	14.6	13.67	14.18
Crude fibre %		2.50	3.50	2.50	3.50	3.50	8.00	3.00	6.00	3.50	6.00	4.00	6.50	4.00	6.50
Calcium %		1.03	1.08	0.99	1.02	0.87	0.93	1.22	1.49	3.22	3.51	3.45	3.76	3.64	3.84
Av. Phosphorus %		0.46	0.48	0.41	0.44	0.37	0.40	0.38	0.41	0.40	0.43	0.37	0.40	0.35	0.38
Sodium %		0.17	0.20	0.16	0.19	0.15	0.19	0.15	0.19	0.16	0.20	0.17	0.20	0.17	0.20
Chloride %		0.17	0.23	0.17	0.22	0.16	0.21	0.16	0.22	0.17	0.23	0.17	0.23	0.17	0.23
Potassium %		0.66	0.80	0.63	0.77	0.58	0.74	0.59	0.76	0.63	0.80	0.62	0.79	0.62	0.79
Crude fat %		2.50	4.00	3.00	4.00	2.50	4.00	4.00	6.00	4.00	8.00	4.00	7.00	4.00	7.00
Linoleic acid %		1.17	2.00	1.10	2.20	1.01	2.12	1.19	2.70	1.57	2.85	1.27	2.83	1.13	2.54

Table 4 content:

- ⇒ Example programme of diets that may be used where maize is the primary cereal and diets are likely to have few other ingredients. Soya may typically be the only major protein source.
- ⇒ Under these conditions, the optimal ME content of the diet is higher especially in the production period. The higher ME content also may help allow extra oil or fat to be added to the diet to help palatability and reduce heat stress under challenging conditions.
- ⇒ Breeder I and Breeder II are usually the only diets used in the production period.
- ⇒ The Breeder III diet shown here is an optional diet only to be used in exceptional circumstances (e.g. if egg size exceeds the performance objective by 3 g according to the age of the flock).

1. NUTRIENT RECOMMENDATIONS FOR FEMALES: EXAMPLES OF NUTRIENT % AND ME CONTENT FOR SPECIFIC SITUATIONS (HOT CLIMATE, LOW FEED INTAKE)

TABLE 5: EXAMPLES OF DIET SPECIFICATION FOR HOT CLIMATES (> 25°C / 78°F) OR WHERE PEAK FEED INTAKE IS < 90% OF TARGET (-10G / D)*

PHASE		WHEAT BASED DIETS WITH ADDED OIL				MAIZE BASED DIETS WITH ADDED OIL			
		BREEDER I		BREEDER II**		BREEDER I		BREEDER II**	
Age (days)		1% lay to 280 d		281 d to depletion		1% lay to 280 d		281 d to depletion	
Suggested ME	kcal / kg	2750		2730		2850		2825	
	MJ / kg	11.51		11.43		11.93		11.83	
	kcal / lb	1248		1239		1293		1282	
Min. amino acids		Tot.	Dig.	Tot.	Dig.	Tot.	Dig.	Tot.	Dig.
Lysine %		0.71	0.64	0.67	0.61	0.73	0.66	0.70	0.63
Methionine %		0.41	0.37	0.39	0.35	0.43	0.38	0.41	0.36
Meth. & Cystine %		0.69	0.62	0.66	0.59	0.71	0.64	0.68	0.61
Valine %		0.71	0.63	0.67	0.60	0.73	0.65	0.70	0.62
Isoleucine %		0.56	0.50	0.54	0.48	0.58	0.52	0.55	0.49
Arginine %		0.78	0.69	0.74	0.66	0.81	0.72	0.77	0.68
Tryptophan %		0.17	0.15	0.16	0.15	0.18	0.16	0.17	0.15
Threonine %		0.57	0.51	0.54	0.48	0.59	0.52	0.56	0.50
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Crude protein %		15.36	15.89	14.44	14.96	15.92	16.46	14.94	15.48
Crude fibre %		3.50	6.00	4.00	6.50	3.63	6.22	4.14	6.73
Calcium %		3.29	3.59	3.53	3.85	3.41	3.72	3.65	3.98
Av. Phosphorus %		0.41	0.44	0.38	0.41	0.42	0.45	0.39	0.42
Sodium %		0.16	0.20	0.17	0.20	0.17	0.21	0.18	0.21
Chloride %		0.17	0.23	0.17	0.23	0.18	0.24	0.18	0.24
Potassium %		0.64	0.82	0.64	0.81	0.66	0.85	0.66	0.84
Crude fat %		4.00	8.00	3.50	7.00	4.15	8.29	3.62	7.24
Linoleic acid %		1.60	2.92	1.30	2.89	1.66	3.02	1.35	2.99

* This is a guide and consult your Hubbard Technical Manager if facing low feed intake for the best solution.

** It is recommended to change to Breeder II diet before 281 days if the egg weight reaches 62 g.

Table 5 shows an example of breeder diets in a programme used in conditions where ME intake per day during production is expected to be low due to for example, high ambient temperature in open sided houses. The assumption here is that low ME intake, and therefore low feed intake, means nutrient intake will not achieve the targets outlined in Table 1.

- Higher ME diets in production > 2825 kcal / kg are recommended in situations where environment may reduce energy requirements or reduce energy intake. The objective is to provide a minimum of 10% of the dietary energy as energy from lipids which is more easily achieved in higher energy diets. Higher ME diets also reduce the pressure on volume of feed intake under challenging conditions.

- Compared with Table 3 and 4 for situations where energy intake during egg production is normal then the nutrient contents in Table 5 have been increased. This is to try to ensure that actual nutrient intake will be closer to the target

- If feed and energy intake are below target, then there is a limit to how much the nutrient content of the diet can be increased. This is especially true for amino acids where an increase of more than 6% in the amino acid : energy ratio is not recommended. This is because a response to increased amino acid intakes is unlikely if energy intake is still limiting egg production and is unlikely to be economically beneficial. In addition, energy used to dispose of excess protein is likely to make heat stress worse.

- Increasing the amount of added fats and oils may also help palatability of mash based diets.

- How the objective of more lipid energy is achieved will depend upon the ingredients available and whether the diets are wheat or maize based.

- Options are shown for lower energy (2750 kcal / kg) wheat-based diets and higher energy (2850 kcal / kg) maize-based diets.

- In most cases where temperature regularly exceeds 25°C, the high energy Breeder I and Breeder II options will be preferred.

- Where diets are wheat based then the most effective way to increase feed intake in lay is by feeding a crumble or pellet but physical quality must be of a consistently high standard.

- For high energy maize-based diets then coarse mash diets are likely to be the best option.



2. NUTRIENT RECOMMENDATIONS FOR MALES IN PRODUCTION

TABLE 6: EXAMPLE OF DIET SPECIFICATIONS FOR MALES

PHASE		MALE 1		MALE 2 OPTIONAL	
Age (days)		141 days to depletion or 141 to 210 days		211 days to depletion	
Suggested ME	kcal / kg	2 800		3 000	
	MJ / kg	11.72		12.56	
	kcal / lb	1270		1361	
Min. amino acids	Tot.	Dig.	Tot.	Dig.	
Lysine %	0.49	0.42	0.47	0.41	
Methionine %	0.26	0.23	0.25	0.22	
Meth. & Cystine %	0.46	0.40	0.44	0.38	
Valine %	0.42	0.35	0.40	0.34	
Isoleucine %	0.40	0.34	0.38	0.33	
Arginine %	0.55	0.49	0.52	0.45	
Tryptophan %	0.12	0.10	0.12	0.10	
Threonine %	0.38	0.32	0.36	0.31	
	Min.	Max.	Min.	Max.	
Crude protein %	11.62	12.18	10.80	11.25	
Crude fibre %	4.00	6.50	4.00	6.50	
Calcium %	0.92	0.98	0.99	1.05	
Av. Phosphorus %	0.39	0.42	0.42	0.45	
Sodium %	0.15	0.21	0.17	0.23	
Chloride %	0.17	0.22	0.18	0.24	
Potassium %	0.62	0.78	0.66	0.84	
Crude fat %	3.00	6.50	3.00	6.50	
Linoleic acid %	1.12	2.52	1.20	2.70	

► REARING DIETS

The diets used in the rearing period can be used for both males and the females. In some cases, this may present difficulties in the brooding period or if reared separately which is discussed on page 11.

► PRODUCTION DIETS

It is recommended that males receive a special Male diet as shown in Table 6. In recent years new feeding strategies have been developed for males using high ME male diets with lower protein content. This is to allow males to maintain sufficient ME intake without an increased risk of excess fleshing. One alternative to feeding Male 1 diet only is a **2-stage approach**:

- ▷ Regular Male 1 diet: to ensure weekly growth to 28–30 weeks of age is on target (using a regular male diet).
- ▷ Male 2 diet from 30 weeks of age or later to slow growth to meet the weekly growth targets using feed with lower protein and higher energy content.

The Male 2 diet is optional and is intended for conventional M77 or M99 males and the implementation of such a male diet may be necessary when it is difficult to control fleshing and energy intake needs to be maintained. → See Performance Objectives *“M77 PS male mated with Premium females”* & Performance Objectives *“M99 PS male mated with Premium females”*.



i



Performance Objectives
M77 PS male mated with
Premium females



Performance Objectives
M99 PS male mated with
Premium females



It is advised that you contact your Hubbard Technical Manager to discuss this option before using the Male 2 diet. The use of the diet is not recommended if:

- ▷ male bodyweights are below the bodyweight target in the period from 24 to 30 weeks of age;
- ▷ weekly growth is slow and erratic;
- ▷ there are other issues affecting feed intake like disease, heat stress or poor feed distribution;
- ▷ the diet is not recommended for Intermediate or Slow Growth Males.

3. VITAMINS AND MINERALS

TABLE 7: ADDED VITAMIN GUIDELINES

Inclusion rates are per kg feed		Rearing	Egg Production and Male Breeders
Vitamin A	IU	12000	13000
Vitamin D3	IU	4000	5000
Vitamin E	IU	100	130
Vitamin K (menadione)	mg	5.0	7.5
Thiamin B1	mg	4.0	5.0
Riboflavin B2	mg	14	16
Pantothenic acid	mg	15	22
Nicotinic acid	mg	60	65
Pyridoxine B6	mg	6.0	8.0
Folic acid B10	mg	3.0	4.0
Cyanocobalamin B12	mg	0.040	0.055
Biotin Vit. H	mg	0.30	0.45
Choline	mg	750	750

1. Where permitted by local regulations, inclusion levels may be increased by 10% if feed intake is observed or expected to be 10% or more below the target feed intake.
2. Check local regulations for the maximum permitted amount of each vitamin especially Vitamin A and D.
3. These recommendations may need to be reviewed if harsh heat treatment conditions are used (> 85°C for over 5 minutes). Please consult a Hubbard Nutritionist.



TABLE 8: ADDED MINERAL GUIDELINES

Mineral		Inclusion rates are per kg feed
Manganese	mg	100
Iron	mg	50
Iodine	mg	2
Copper	mg	10
Zinc	mg	100
Selenium	mg	0.30 – 0.40

1. Assumes inorganic and organic mineral sources.
2. Check local regulations for the maximum permitted level of all minerals but particularly for zinc and selenium.



4. GUIDELINES FOR PHYSICAL QUALITY OF FEED

Providing consistent physical quality of the feed is important at all stages to ensure adequate feeding behaviour. Guidelines are given in the table below for crumbs, mash and pellets.

- Coarse mash is the preferred option for the Grower, Transition, Breeder and male diets.
- The use of a feed sieve to monitor physical feed quality is highly recommended. → See “*Hubbard Feed Sieve Tool*”.
- The percentages show the guideline amount in each category of particle size after sieving with screens of 3, 2 and 1 mm such as with a Hubbard feed sieve. It is important for all feeds that the percentage of feed passing through the 1 mm screen does not exceed the amounts shown.
- Where a sieve with a 0.5 mm screen is used then for mash feeds no more than 10% of particles should pass through this screen.

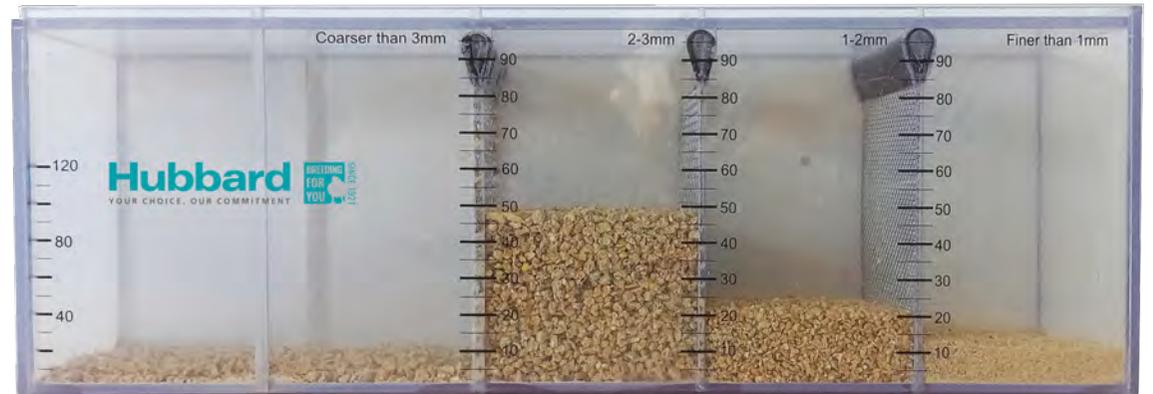


TABLE 12: GUIDELINES FOR PHYSICAL QUALITY OF FEED

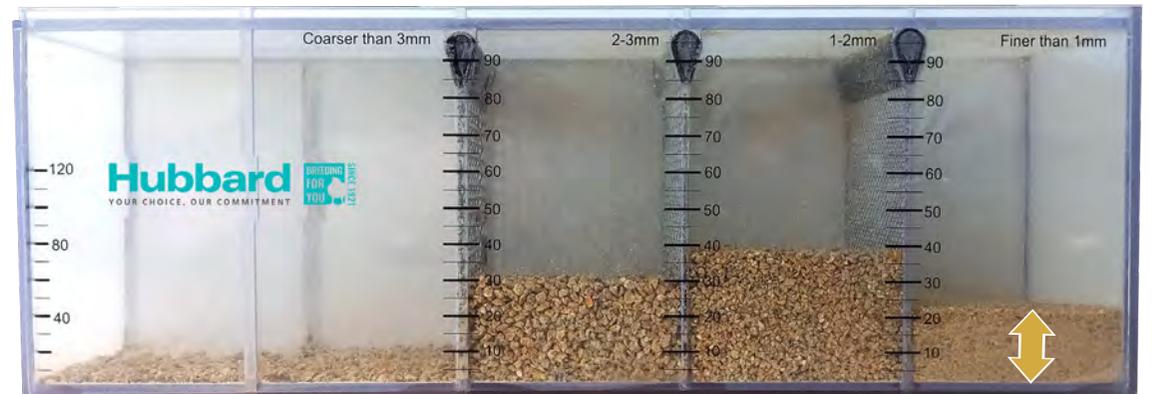
CRUMBS				
	> 3 mm	2-3 mm	1-2 mm	< 1 mm
Starter Good	0%	40%	55%	5%
Starter Average	10%	40%	40%	10%
Grower / Breeder	50%	30%	10%	10%

MASH				
	> 3 mm	2-3 mm	1-2 mm	< 1 mm
Starter	5%	25%	50%	20%
Grower	10%	35%	35%	20%
Breeder	15%	40%	30%	15%

PELLETS				
	> 3 mm	2-3 mm	1-2 mm	< 1 mm
Grower / Breeder	> 70%	< 10%	< 10%	< 10%



Physical quality of the crumble in the feed hopper: correct particle size



Physical quality of the crumble in the chain feeder after one turn: too much fine particles





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